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OPERABLE UNIT TWO (OU2) REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) WORK PLAN

Prepared for: South Dayton Dump and Landfill

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Partners in Sustainability

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1.0 INTRODUCTION

This document is the Operable Unit Two (OU2) Remedial Investigation/Feasibility Study (RI/FS) Work Plan for the South Dayton Dump and Landfill Site (Site). The purpose of this document is to present a summary of available information and identify data needed to further characterize OU2 conditions for the OU2 RI. Conestoga-Rovers & Associates (CRA) has prepared this OU2 RI/FS Work Plan on behalf of the Respondents to the Administrative Settlement Agreement and Order on Consent (ASAOC) for Remedial Investigation/Feasibility Study (RI/FS) of the Site, Docket No. V-W-06-C-852 (Respondents).

The Respondents include Hobart Corporation (Hobart), Kelsey-Hayes Company (Kelsey-Hayes), and NCR Corporation (NCR). These three Respondents are and have been performing the Work required by the ASAOC under the direction and oversight of the United States Environmental Protection Agency (USEPA).

1.1 SITE LOCATION AND BACKGROUND

The Site is located at 1901 through 2153 Dryden Road (sometimes called Springboro Pike) and 2225 East River Road in Moraine, Ohio. The approximately 80-acre Site is a former disposal site and includes areas where municipal, industrial, and residual waste, and construction and demolition debris were disposed. The Site location is shown on Figure 1.1.

The Site is bounded to the north and west by the Miami Conservancy District (MCD) floodway[1] (part of which is included in the definition of the Site), the Great Miami River (GMR) Recreational Trail and the GMR beyond. The Site is bounded to the east by Dryden Road with light industrial facilities beyond, to the southeast by residential and commercial properties along East River Road with a residential trailer park beyond, and to the south by undeveloped land with industrial facilities beyond.

The Site has been defined in the Statement of Work (SOW) as an area of approximately 80 acres, including the Valley Asphalt plant in the northernmost portion of the Site (Parcel 5054), an auto salvage yard in the southeast (Parcels 3753 and 4423) and a gravel

[1] The MCD defines a floodway as the channel of a river or watercourse and the adjacent land areas that have been reserved in order to pass a specified flood discharge. The floodway is usually characterized by any of the following: moderate to high velocity flood water, high potential for debris and projectile impacts, and moderate to high erosion forces. The MCD floodway is not the same as the 100-year floodway and 100-year floodplain areas at the Site based on FEMA flood insurance maps, which are more extensive than the MCD definition.

pit/quarry pond (the Quarry Pond, Parcels 3274 and 5178) in the southern part of the Site. The central 40 acres (described as 23 acres in some documents) of the Site was referred to as the South Dayton Dump and Landfill in some reports. More recent information including an undated tax map in the Montgomery County Health Department (MCHD) files, soil boring logs, drums found at Valley Asphalt, USEPA's aerial photograph analysis, underground storage tank (UST) closure reports, the deposition of Horace (Jack) Boesch Jr., and investigations completed as part of the OU1 RI indicate that landfilling and other waste disposal and handling activities occurred across much of the Site and that the Site extends partially onto the adjacent MCD-owned floodway to the west of the Site.

1.1.1 OWNERSHIP

Cyril Grillot and Horace Boesch acquired interests in portions of the approximately 40-acre central portion of the Site starting in 1936. The properties to the north (currently Valley Asphalt) and the vacant land and Quarry Pond to the south were also owned by Grillot and Boesch. Horace Boesch purchased the land to the north in 1945, (a half interest was subsequently transferred to Cyril Grillot in 1951) and sold it to Valley Asphalt in 1993.

The SOW identifies the following 14 Parcels from the Montgomery County Tax Rolls as part of the Site: 5054, 5171, 5172, 5173, 5174, 5175, 5176, 5177, 5178, 3274, 3753, 4423, 4610, and 3252. Subsequent investigations identified waste and Site-related fill material on adjacent Parcels 3056, 3057, 3058, 3275, and 3278. In correspondence from USEPA (March 15, 2010) and the Respondents (April 1, 2010), these Parcels were added to the definition of the Site.

Seven Parcels are jointly owned by Katherine A. Boesch, widow of Horace J. Boesch, and Margaret C. Grillot, widow of Cyril J. Grillot. Horace J. Boesch and Cyril J. Grillot had jointly owned the seven Parcels (5171, 5172, 5173, 5174, 5175, 5176, and 5177) since at least 1952 and had acquired them in a series of transactions between 1936 and 1952. Parcels 5171 and 5054 were part of two tracts acquired by Horace J. Boesch or Cyril J. Grillot in 1936 and 1952, respectively. Parcel 5171 is part of the Grillot and Boesch Plat and is currently jointly owned by Katherine A. Boesch and Margaret C. Grillot. Parcel 5054 was acquired by Valley Asphalt in 1993; however, lease records suggest that Valley Asphalt's association with the Parcel began in 1956.

The south and southeastern parts of the Site comprise five Parcels 3274, 3753, 4423, 4610, and 3252. Horace J. Boesch or Cyril J. Grillot at one time owned these Parcels.

Parcel 3274 is currently owned by the MCD and was acquired from the University of Dayton in 1969. Horace J. Boesch and Cyril J. Grillot gave the property to the University of Dayton in 1968. Boesch and Grillot had held the Parcel since acquiring a 30-acre tract from John Albert Davis in 1945.

The 30-acres also included Parcels 3753, 4423, and 4610. Parcel 3753 was conveyed to Doyle Roberson and Virginia Roberson in 1975, who then conveyed the Parcel to Ollie Lacy in 1988. Following the distribution of property after the death of Horace Boesch, Cyril Grillot and the Boesch heirs conveyed Parcels 4423 and 3252 to Ollie and Judith Lacy in two transactions in 1981. Following the death of Judith Lacey in 1987, Ollie Lacy acquired sole ownership of these Parcels. In 1989, Ollie Lacy conveyed Parcel 4610 to the current owner, Ronald Barnett. Attached to the deed was a legal description of Parcel 4610 that implied that it was originally part of Parcel 4423.

Following Ollie Lacy's death in 1990, his heir conveyed Parcels 3252, 3753, and 4423 to Sharon Roe, who then conveyed Parcel 3252 to Ronald Barnett in 1992 and Parcels 3753 and 4423 to South Dayton Salvage, Inc in 1996. Ronald Barnett is the owner of Parcels 3252 and 4610. South Dayton Salvage, Inc. conveyed both Parcels 4423 and 3753 to Jim City Salvage, Inc. after 1999. The current co-owners of Jim City Salvage are Jim and Dave Worley. Williem Zachar, the previous owner of South Dayton Salvage, signed the Land Installment Agreement for Parcel 3753 in 1978.

The MCD owns Parcels 3056, 3057, 3058, 3207, 3274, 3275, and 3278. MCD acquired Parcel 3056 prior to 1937 and there was no evidence that any member of either the Grillot or the Boesch families ever owned it. While there are some location discrepancies in the records with respect to Parcels 3057 and 3058, ownership by Horace J. Boesch (Parcel 3057) and Cyril J. Grillot (Parcel 3058) is limited to 1 or 2 years in the mid-1930s. Parcel 3275 was acquired by MCD in 1938 and Parcel 3207 was acquired by Walloon Holdings, LLC, from the heirs of John Albert Davis.

1.1.2 GEOLOGY AND HYDROGEOLOGY

The Dayton area is located within the buried pre-glacial valley system that underlies the present day GMR and its tributaries in southwestern Ohio. This pre-glacial valley system is known as the Miami Valley Aquifer System. The regional overburden geology of the Dayton area consists of glacial tills, and glaciofluvial sand and gravel deposits. Norris and Spieker (1966) defined the overburden units, based on general character and relative position to be (from top to bottom):

- Ground Moraine (glacial till) – composed of silt, gravel, and clay; found primarily in the uplands area (not present at the Site)
- Upper Aquifer Zone – the saturated glaciofluvial sand and gravel zone located above a major till-rich zone
- Till-Rich Zone – composed of discontinuous fine-grained glacial till and other fine-grained materials with substantial components of sand and gravel
- Lower Aquifer Zone – the glaciofluvial sand and gravel zone located beneath the Till-Rich Zone

The subsurface geology in the vicinity of the Site, identified by CRA, consists of fill and waste underlain by glacial tills, and glaciofluvial sand and gravel deposits.

Norris and Spieker (1966) identified three principal hydrogeologic units in the Dayton area, as follows:

- Upper Aquifer Zone – the upper portion of the saturated glaciofluvial sand and gravel facies
- Till-Rich Zone – a zone of discontinuous low permeability till facies interspersed with sand and gravel facies which acts as an aquitard in some areas
- Lower Aquifer Zone – the lower portion of the saturated glaciofluvial sand and gravel facies

The subsurface hydrostratigraphy in the vicinity of the Site is consistent with the regional geology of the Miami Valley Aquifer with the exception that the Till Rich Zone is highly discontinuous beneath the Site. Monitoring wells screened above approximately 675 ft above mean sea level (AMSL) appear to be representative of the Upper Aquifer Zone. Monitoring wells screened below 675 ft AMSL appear to be representative of the Lower Aquifer Zone. Due to the stratigraphic variation of the Till Rich Zone both vertically and laterally, the implied 675 ft AMSL boundary between the Upper and Lower Aquifer Zones is approximate and may vary in elevation across the Site.

Groundwater flow in the Upper Aquifer Zone is influenced by the presence of the GMR to the north and west of the Site. Shallow groundwater (i.e., Upper Aquifer Zone) typically flows west/southwest across the Site, and/or radially (in the northern part of the Site) towards the GMR. Occasional flow slightly to the southeast has been documented during extended periods of high flow in the GMR. Depending on surface water elevations at different times of the year, shallow groundwater discharges to, or is

recharged by the GMR. During flood events, groundwater flow is occasionally reversed and migrates from the GMR to the Site. Groundwater flow in the Lower Aquifer Zone is predominantly to the southwest across the Site, with occasional slight southeasterly components, and is not significantly affected by the GMR. The groundwater elevation in the vicinity of the Site is typically between 700 and 725 ft AMSL (likely closer to 710 ft AMSL at the Site).

1.2 OPERABLE UNITS

In a letter dated January 9, 2008, USEPA proposed that the Site be divided into two operable units, OU1 and OU2. OU1 comprises the "landfill source area of the Site" and OU2 comprises "off-Site areas not addressed by the presumptive remedy". USEPA proposed that the Respondents complete a Streamlined RI/FS report for OU1 and a conventional RI/FS report for OU2.

1.2.1 OPERABLE UNITS LIMITS

OU1 includes the following parcels:

- Parcel 5054 (Valley Asphalt)
- Parcels 5171, 5172, 5173, 5174, 5175, and 5176 (Boesch and Grillot)
- Parcel 5177 including road easement but excluding water and submerged portions of the Quarry Pond (Boesch and Grillot)
- Part of Parcels 3278, 3058, 3057, and 3056 including embankments (owned by the MCD) onto which waste extends
- Part of Parcel 5178 containing north Quarry Pond embankment (Boesch and Grillot)
- The unnumbered parcel at the Site entrance

OU1 includes the following areas or media:

- Landfill material, surface and subsurface soil and hot spots
- Leachate
- Landfill gas (LFG) and soil vapor

- Surface water and sediment
- Air

The Site limits of OU2 are approximated on Figure 1.2. OU2 includes the following areas or media, which are not part of OU1:

- Landfill material, surface and subsurface soil, and hot spots outside OU1 (e.g., the floodplain area between the Site and the GMR[2]) attributable to historic Site operations
- Parcel 3274 and parts of Parcels 5177 and 5178 not addressed in OU1, including submerged portions of the Quarry Pond
- Parcels 3753, 4423, 4610, and 3252, including active businesses along the southeast portion of the Site
- Portions of Parcel 3275, which are owned by MCD, upon which waste has been placed
- Shallow groundwater (i.e., nominally at elevations above 675 feet above mean sea level [ft AMSL] or the top of the first till layer, whichever is encountered first), within and outside OU1
- Deeper groundwater (i.e., nominally at elevations below 675 ft AMSL or below the first till layer, whichever is encountered first), within and outside OU1
- Leachate outside OU1 (e.g., the floodplain area between the Site and the GMR
- Landfill gas (LFG) and soil vapor outside OU1
- Surface water and sediment outside OU1 (e.g., in the Quarry Pond and in the GMR adjacent to and downstream of the Site)
- Air outside OU1

These areas and media, which are not addressed by the Presumptive Remedy, are the Site areas or media in which it is not clear that there is a basis for remedial action and whether a Presumptive Remedy approach is appropriate. Therefore, the Respondents will address these areas and media through a conventional (i.e., not streamlined) RI/FS, human health risk assessment, and ecological risk assessment.

[2] The MCD defines a floodplain as a strip of relatively flat and normally dry land alongside a stream, river or lake that is covered by water during a flood. The floodplain area between the Site and the GMR is not the same as the 100-year floodway and 100-year floodplain areas at the Site based on Federal Emergency Management Agency (FEMA) flood insurance maps, which are more extensive than the MCD definition.

Figure 1.2 depicts the on-Site OU2 Parcels. As discussed by USEPA and the Respondents during a conference call held on May 23, 2013, OU2 includes any area, outside of OU1, where OU1 contamination has come to be located. Thus, OU2 potentially includes any area outside of the OU1 boundary that contains Site-related contamination.

1.3 PROJECT ORGANIZATION

This section describes project organization, responsibilities of the project team, data management procedures, and community relations.

Appendix A Figure A.1 presents the organizational structure of the project. A schedule presenting the anticipated timeframe of the project deliverables and review periods will be provided under separate cover.

1.4 REPORT OBJECTIVES AND ORGANIZATION

The objective of this document is to provide the basis for determining the field data collection activities that are needed to characterize OU2 conditions for the OU2 RI.

This document is organized as follows:

- Section 1.0 provides an introduction, including Site background, a discussion of operable units, report objectives and organization
- Section 2.0 provides information regarding previous investigations, including analytical data and sampling locations, and identified data gaps
- Section 3.0 provides a conceptual site model (CSM)
- Section 4.0 provides the remedial action objectives, remedial technologies, and applicable or relevant and appropriate requirements
- Section 5.0 provides a description of the proposed field data collection activities and data quality objectives
- Section 6.0 provides background comparison procedures
- Section 7.0 provides risk assessment procedures
- Section 8.0 provides references for previous investigations and other documents

2.0 SUMMARY OF OU2 INVESTIGATION RESULTS

This section presents a summary of the investigation results for the OU2 Parcels that are part of the Site. The Quarry Pond, Jim City, and Ron Barnett Parcels are collectively referred to herein as the OU2 Southern Site Parcels. The Quarry Pond Parcels occupy Parcels 3274, portions of Parcel 3275 upon which waste has been placed, and parts of Parcels 5177 and 5178 not addressed in OU1, including submerged portions of the Quarry Pond. Jim City occupies Parcels 3753 and 4423. Ron Barnett occupies Parcels 4610 and 3252. The OU2 Southern Site Parcels are shown on Figure 1.2.

The following also presents a summary of available information related to the history of the OU2 Southern Site Parcels, and a visual description[3] of the nature of the material encountered at OU2 investigative locations. This discussion is based on a review of historic documents, a review of aerial photographs, and several intrusive investigations, including historical investigations, borehole advancement, test pit and test trench excavation, and soil and groundwater sample collection. Data gaps based on the available information are also presented in this section.

2.1 QUARRY POND PARCELS

The investigations and sample collection activities completed by CRA and others in the Quarry Pond Parcels include the following:

- Geophysical investigations (EM31 conductivity, EM61 metal detection, and total field magnetic anomaly surveys). See Figure 2.1 for areas of identified anomalies.
- Test trenches excavated based on the results of the geophysical surveys and other field observations. These are identified as TT-16, TT-16A, and TT-17 on Figure 2.1.
- Soil/fill material samples from selected test trenches. The analytical results are summarized in Table 2.1.
- Surface water samples from three locations as shown on Figure 2.2. The analytical results are summarized in Table 2.2.
- Sediment samples from eight locations (during earlier investigations by others) as shown on Figure 2.2. The analytical results are summarized in Table 2.3.

[3] Waste classifications as described in OAC 3745-27, 29, 30, and 400, are based on visual observations. OAC waste classifications do not require analytical characterization.

- Radiation screening of soil/fill (at ground surface). The results are shown on Figure 2.3.
- Vertical Aquifer Samples (VAS) from three locations (VAS-13, VAS-19, and VAS-20) as shown on Figure 2.4. The analytical results are summarized in Table B.1 of Appendix B.
- Groundwater samples from monitoring wells (MW-209, MW-209A, MW-212, MW-218A, and MW-218B) as shown on Figure 2.4. The analytical results are summarized in Table B.2 of Appendix B.

Overview of OU2 Quarry Pond Parcels History and Fill Material Information

Based on the USEPA Aerial Photographic Analysis of South Dayton Dump Site and CRA's analysis of the available aerial photos, the area south of the east-west access road (portions of Parcels 3274 and 5178) was excavated from the 1950s to 1970s for a gravel extraction operation. The northeastern portion of Parcel 5178 appears to have been partially filled in by 1981. There are no data to indicate whether the area of the present Quarry Pond below the water level was filled beyond the material placed in the northeastern portion of the Quarry Pond or beyond the current extent of the northern, eastern, and western embankments of the Quarry Pond.

There are no data to indicate how far the material placed in the northeastern portion of the Quarry Pond extends into the pond or whether the material placed along the embankments extends into the Quarry Pond. CRA did not observe non-native soil material during drilling VAS-20, located in the center of the southern Quarry Pond embankment. However, there are no data to indicate how far the landfill material observed during drilling of VAS-13 at the western corner of the southern Quarry Pond embankment, or TT-18 on Parcel 3753 extends towards VAS-20. CRA observed traces of glass and concrete debris in the top two feet of fill from VAS-13.

There is debris in the Quarry Pond. Much of the debris is present at the surface and may have either been dumped by third parties or trespassers, after the Site operations ceased, into the pond or washed there during storm events. At the time of CRA's November 17 and 18, 2005 inspections, CRA observed four partially submerged drums that appeared to be empty in the northeastern part of the Quarry Pond. Ohio EPA, Ohio Department of Natural Resources (DNR) and the District Attorney's Office completed a sonar and underwater camera investigation of the Quarry Pond on November 9, 2012. The sonar survey identified tires and 25 to 30 objects of sizes and shapes that may be indicative of drums; these possible drums were dispersed throughout the Quarry Pond but were most prevalent at the north edge of the pond, below the east-west access road that

transects the Site. The Ohio DNR observed a mound of submerged tires as well as multiple tires along the embankment leading from the Jim City Parcels. The locations of the submerged objects identified during the sonar survey are shown on Figure 3.2.

The geophysical survey results for the Quarry Pond floodplain (northeastern portion of Parcel 5178) indicate that anomalous EM61 responses were detected in areas where reinforced concrete was observed at ground surface. CRA observed coincident EM61 and magnetic anomalies in the vicinity of TT-16 and TT-16A. CRA encountered metal rods and rebar in the upper 5 feet of waste at these locations, consistent with EM31 and EM61 readings for these anomalies.

CRA excavated three test trenches (TT-16, TT-16A, and TT-17), installed VAS boreholes at three locations (VAS-13, VAS-19, and VAS-20), and installed three monitoring wells (MW-209A, MW-218A, and MW-218B) on Quarry Pond Parcels 3274 and 5178. Historic investigations included one soil boring, GT-212, and installation of two monitoring wells (MW-209 and MW-212) in this area. At these 12 test trench and soil boring locations in the northeast portion of Parcel 5178, and in the embankment surrounding the Quarry Pond, CRA and previous consultants visually identified mainly fill and residual waste (i.e., foundry sand) as well as construction and demolition debris (e.g., concrete, brick, asphalt, rebar, and roofing shingles). Due to the lack of anomalies, CRA did not excavate trenches or advance any soil borings on Parcel 3275.

Based on field screening, CRA collected three soil samples from two locations on Parcel 5178: TT-16 and TT-17. The concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals in soil samples collected from these two test trench locations were greater than Industrial Soil USEPA Regional Screening Levels (RSLs).

The concentrations of vinyl chloride in groundwater samples collected from VAS-19 and MW-209A were greater than the MCL and Tapwater criteria, and greater than VISLs. The concentrations of VOCs in groundwater samples collected from VAS-19, VAS-20, and MW-209 were greater than Tapwater criteria. The concentrations of PAHs in groundwater samples collected from VAS-19 and VAS-20 were greater than MCL and/or Tapwater criteria. A groundwater sample collected from MW-209A contained concentrations of PCBs and pesticides that were greater than Tapwater criteria; there were no MCLs for these parameters. Unfiltered groundwater samples collected from all VAS locations contained concentrations of arsenic and lead that were greater than MCLs. Concentrations of dissolved (i.e., filtered) metals sampled at all VAS locations, and Quarry Pond Parcel monitoring wells were less than the concentrations of total (i.e., unfiltered) metals at all locations, typically by more than one order of magnitude, and were less than MCLs.

The Quarry Pond itself encompasses approximately 15 acres of the 20-acre Quarry Pond Parcels. In April 1999 and May 2000, Payne Firm, Inc. (PFI) collected three surface water samples from the Quarry Pond during each sample event. PFI analyzed all surface water samples for VOCs. All surface water samples contained non-detectable concentrations of VOCs.

CRA has not collected any samples for USEPA Target Compound List (TCL) or Target Analyte List (TAL) analyses from Parcel 3274, and CRA has not completed any installations nor has any analytical data for the subsurface material present on Parcel 3275.

Analytical data for eight sediment samples Ohio EPA and the Payne Firm Inc. (PFI) collected between 1996 and 2000 are available for the Quarry Pond. Ohio EPA collected two sediment samples 15 to 18 feet below the water surface of the Quarry Pond, 150 and 350 feet west of the northeast corner of the Quarry Pond in 1996 (samples S15OEPA and S16OEPA) and submitted the sediment samples for analysis of VOCs, SVOCs, metals, PCBs, pesticides, and cyanide (Table 2.3). The concentrations of PAHs and metals in the Ohio EPA sediment samples were greater than Industrial Soil RSLs. The concentrations of acetone, PAHs, metals, PCBs, pesticides and cyanide in the Ohio EPA sediment samples were greater than ecological screening levels (ESLs). PFI collected three sediment samples during each of their 1999 and 2000 sampling events (Sediment-1, Sediment-2, Sediment-3, SED-1, SED-2, and SED-3) for VOC analyses (Table 2.3). The depths of the PFI sediment samples are unknown. The concentrations of VOCs in the PFI samples, if detected, were less than Industrial Soil RSLs. The concentration of acetone in SED-3 was greater than the ESL, there were no other exceedances of ESLs in the PFI Quarry Pond sediment samples..

In 2008, CRA completed a radiation survey of the Site. CRA measured radiation levels ranging from 50 to 70 microroentgen per hour (μR/h) in the northeast corner of the Quarry Pond. The Ohio Administrative Code 3701:1-38-13 details radiation dose limits for individual members of the public. The dose in any unrestricted area from external sources, should not exceed 0.02 millisieverts, or 0.002 rem, in any 1 hour. CRA's maximum Quarry Pond radiation reading of 70 μR/h (0.000070 rem/h) was less than the dose specified in the Ohio Administrative Code.

The observed depths of fill and waste beneath the Quarry Pond Parcels range from 0 to 36 feet.

Data Gaps

CRA has identified the following data gaps in the Quarry Pond area:

- Characterization of the fill and soil material and quality (surface and sub-surface) surrounding the Quarry Pond within Parcels 3274, 3275, and 5178
- Further characterization of groundwater conditions below the fill and soil material and along the perimeter of the Quarry Pond Parcels
- Based on data collected from the proposed OU2 soil and groundwater investigations, soil gas monitoring within the fill material and along the southern and western perimeters of the Quarry Pond Parcels may be warranted
- Determination of the presence of non-native material at the base of the Quarry Pond
- Characterization of the soil/sediment in Quarry Pond areas that are easily accessible to humans and with evidence of use (e.g., areas where anglers, recreational users, or trespassers are present; areas where water is approximately 3 feet deep or less and where sediment can support body weight)
- Characterization of surface water quality within the Quarry Pond

2.2 OU2 JIM CITY AND RON BARNETT PARCELS

The investigations and sample collection activities completed by CRA on the Jim City and Ron Barnett Parcels (Parcels 3753, 4423, 4610, and 3252) include the following:

- Geophysical investigations (EM31 conductivity, EM61 metal detection, and total field magnetic anomaly surveys). See Figure 2.1 for areas of identified anomalies.
- Test trenches based on the results of the geophysical surveys and other field observations. These are identified as TT-17 and TT-18 on Figure 2.1.
- Soil/fill material samples from both test trenches. The analytical results are summarized in Table 2.1.
- Soil gas probes at four locations (GP07-09, GP08-09, GP09-09, and GP10-09) and one location (GP06-09) on adjacent Parcel 3261, as shown on Figure 2.2. The monitoring results are shown on Table 2.4 (VOCs) and Table 2.5 (field parameters).
- Radiation screening of soil/fill (at ground surface). The results are shown on Figure 2.3.
- VAS groundwater samples from one location (VAS-22), as shown on Figure 2.4. The analytical results are summarized in Table B. 1 of Appendix B.

Overview of OU2 Jim City and Ron Barnett Parcels History and Fill Material Information

The USEPA Aerial Photographic Analysis of South Dayton Dump Site include aerial photographs taken between the 1950s and 2000 that show portions of the area south of the east-west access road and east of the Quarry Pond (portions of Parcels 3753 and 4423 and the western portion of Parcel 4610) were excavated between the 1950s and 1970s. The ground surface in the eastern portions of these parcels appears to have been disturbed during the same time period; however, it is unclear in the aerial photographs, whether the excavation extended across the entirety of these parcels. Based on aerial photographs and Site documents, the eastern portion of Parcels 3753, 4423, and 4610, appears to have been re-graded and was filled during the 1970s and 1980s. Filling commenced at the eastern side of Parcel 3753 and progressed westward, resulting in the filling of Parcels 3753 and 4423 to current grades.

Based on information from Ohio EPA records and a review of aerial photographs, Mantle Oil Service, formerly located at 2227 East River Road, operated on Parcel 4610 between 1971 and 1986/7. The aerial photographs indicate buildings were constructed on Parcel 4610 sometime between September 1970 and April 1973. Additional buildings and ASTs are visible in the 1975 aerial photograph.

During the geophysical investigation, CRA detected metallic anomalies associated with scrap metal and partially buried car parts on Parcels 3753 and 4423 (Jim City Salvage property). The EM61 metal results for Parcels 3753 and 4423 (Jim City Salvage property) indicate that the majority of the responses can likely be attributed to metallic objects, relating the scrap metal operations at or near ground surface.

CRA identified two areas of greater conductivity on the Jim City Salvage property. A summary of the geophysical anomalies is provided on Figure 2.1. CRA did not identify any significant magnetic or EM61 metallic responses in the northernmost elevated EM31 conductivity anomaly on Jim City Parcel 4423, which indicates the anomalies are likely the result of conductive fill or waste, rather than buried metal objects, such as drums or tanks. CRA encountered rebar and scrap metal in the upper 5 feet of waste during the excavation of TT-17, which was located 38 feet south of the EM31 anomaly that had a conductivity response of 50 milliSiemens per meter (mS/m). On Parcel 4423, CRA encountered foundry sands during the drilling of VAS-22, which was located within the southern conductive anomaly. The identified material and associated depths are consistent with EM31 and EM61 readings for these anomalies. It is not possible to say whether TT-18 and GP07-09 were located within or outside of conductive anomalies, as

Parcel 3753 was not included in the EM31 Electromagnetic Survey because the Parcel could not be surveyed, due to the presence of surface material (e.g., manhole lids, tire rims, mechanical equipment) that could not be moved.

CRA identified two areas of conductive areas on Parcel 4610 (one of the Ron Barnett Construction Parcels). The EM31 conductivity anomalies on Parcel 4610 contained a lack of magnetic or EM61 metal detection responses, which indicates the anomalies may be the result of conductive fill or waste, rather than buried metal objects, such as drums or tanks. CRA encountered dark gray/black sand and silt during the advancement of GP10-09, located within the larger of the two conductive anomalies on Parcel 4610. The identified material and associated depths are consistent with EM31 and EM61 readings for these anomalies.

Where present the observed depth of fill beneath the Jim City and Ron Barnett Parcels ranges from 5 feet to approximately 36 feet.

CRA excavated two test trenches (TT-17 and TT-18), installed one VAS boring (VAS-22), and installed four soil gas probes (GP07-09 to GP10-09) on the Jim City and Ron Barnett Parcels. The soil gas sample collected from GP08-09 contained chloroform at a concentration greater than the residential soil vapor screening level (SVSL). The soil gas samples collected from GP09-09 and GP10-09 contained VOCs (chloroform, naphthalene, tetrachloroethene (PCE), and/or trichloroethene (TCE)) at concentrations greater than residential and/or industrial SVSLs. At these seven locations on the Jim City and Ron Barnett Parcels, CRA encountered residual waste (foundry sand) and construction and demolition debris (concrete, wood, brick, and railroad ties), to depths of 14 feet below ground surface (bgs).

In 2009, the Respondents and USEPA completed exterior soil gas sampling events to assess the presence of landfill gas and soil vapor at Site locations where historic information indicated potential landfill gas generation concerns. The Respondents installed five soil gas probes (GP06-09, GP07-09, GP08-09, GP09-09, and GP10-09) within or in the immediate vicinity of the OU2 Southern Site Parcels. Concentrations of all parameters in samples collected from GP06-09, GP07-09, GP08-09, and GP10-09 were less than the Residential and Industrial Soil Vapor Screening Levels (SVSLs[4]). The soil

[4] The SVSLs were derived by applying the more stringent of the USEPA Residential and Industrial Air RSLs (USEPA, November 2013) and the Ohio Department of Health Screening Levels (ODH Letter to USEPA, dated July 6, 2012, revised October 2012), and multiplying by the USEPA Region 5 Vapor Intrusion Guidebook (USEPA, 2010) default soil gas-to-indoor air attenuation factor of 0.1. The RSLs are derived assuming a target 10^{-6} target excess lifetime cancer risk (ELCR) or hazard index (HI) of 0.1. The full list of SVSLs is provided in Appendix D.

vapor sample collected from GP09-09 (screened from 6.5 to 7.5 ft bgs) contained TCE at a concentration of 2,000 micrograms per cubic meter (µg/m^3), which is greater than the SVSLs (2.1 and 8.8 µg/m^3, respectively).

The Respondents completed additional investigation in the vicinity of GP09-09 (BH24-13, 81 ft NE of GP09-09, and BH25-13, 26 ft SW of GP09-09) in 2013 as part of the Phase 1A groundwater and data gap investigation. The Respondents collected shallow groundwater samples (i.e., at the water table, approximately 20 ft bgs) from BH24-13 and BH25-13 that contained concentrations of TCE (1.3 – 2.0 µg/L) greater than residential Vapor Intrusion Screening Levels (VISLs) (i.e., criteria protective of residential indoor air[5]) (0.52 µg/L), but less than industrial VISLs (2.19 µg/L).

GP09-09 is located on the southeastern boundary of Parcel 4610, which is occupied by Barnett Construction. Municipal water and natural gas are supplied to a portion of Parcel 4610 via underground lines, which could create a preferential pathway for the migration of TCE from other areas of high TCE concentrations in groundwater. However, the Respondents have thoroughly investigated the TCE soil vapor concentration detected in GP09-09 through shallow groundwater sampling and vapor intrusion investigations (Figures 9 to 11 and Tables 61 and 62 in *Proposed Monitoring Well and Vertical Aquifer Sampling Locations: Phase 1B and 2A (Proposal),* CRA, January 2014). The nearest groundwater monitoring location where TCE has been detected in water-table groundwater samples at concentrations that exceed the criteria protective of industrial indoor air is VAS-21 (15 µg/L) (Table 4.4 in *Remedial Investigation Report: Operable Unit 1 (OU1)*, CRA, April 2010), which is located 560 ft NE of GP09-09. Concentrations in water-table groundwater samples collected from locations that are side-gradient to down-gradient of VAS-21 and between VAS-21 and GP09-09 (i.e., BH13-13 through BH18-13, BH-23-13, and BH24-13) were all less than both the

[5] Groundwater concentrations that are protective of residential and industrial air were calculated using the following equation from Appendix H.6 of the *Vapor Intrusion Pathway: A Practical Guideline*. Interstate Technology & Regulatory Council, 2007:

- $C_{GW} = C_{IA}/(H \times \alpha \times 1000\ L/m^3)$,
- where
- C_{GW} = groundwater screening level (µg/L)
- C_{IA} = target indoor air level (µg/m^3)
- H = Henry's law constant (dimensionless)
- α = groundwater attenuation factor (dimensionless)

USEPA Residential and Industrial Indoor Air RSLs (November 2013) were used for the target indoor air levels (C_{IA}). An attenuation factor of 0.001 is used, in accordance with the draft *OSWER Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air*, USEPA, 2013.

residential and industrial VISLs. Therefore, it is unlikely that TCE in shallow groundwater elsewhere on Site is migrating to GP09-09 via preferential pathways.

In 2012 and 2013, the Respondents completed additional investigation into the soil gas to indoor air risks to potential receptors from GP09-09 through sub-slab and indoor air sampling of occupied buildings located on and in the immediate vicinity of the Site (Figures 1.3, 2.18, 2.19, 2.22, 2.24, 2.25, 2.26, 2.29 and Tables 4.1, 4.2, 4.5, 4.6, 4.7, 4.8, 4.11, 4.12 in *Vapor Intrusion Investigation Summary Report*, CRA, December 2012). TCE was either not detected or detected at concentrations less than USEPA and Ohio Department of Health (ODH) screening levels in sub-slab soil vapor, indoor air, and crawl space samples in buildings located in the immediate vicinity of GP09-09. Table D.3 in Appendix D presents the USEPA Residential and Industrial Air RSLs, and the ODH Screening levels. For all parameters, the USEPA Industrial Air RSLs were less than the ODH screening criteria[6].

The sub-slab and indoor air sampling of the buildings on Parcel 4610 and the adjacent Parcel 3254, indicated that concentrations of TCE were less than USEPA and ODH SVSLs and IASLs. Therefore, the TCE detected in soil vapor samples collected from GP09-09 is not due to TCE in shallow groundwater and is not impacting the buildings in the vicinity of GP09-09. The TCE detected in the soil vapor at GP09-09 appears to be limited in area and may be the result of localized soil impacts. The Respondents do not propose to complete any further investigation of the TCE at GP09-09. Should data obtained during the investigations proposed herein demonstrate a need to further investigate TCE at GP09-09, the Respondents will propose such investigation as may be appropriate.

In 2012 and 2013, The Respondents and USEPA completed vapor intrusion studies to assess potential effects of soil vapor on occupied buildings located on and in the immediate Site vicinity. The locations of the VI-investigated buildings are presented on Figure 2.5. The Respondents did not identify any vapor intrusion issues within the OU2 Southern Site Parcels. The Respondents did identify an incomplete vapor intrusion pathway in Building 24, occupied by Globe Equipment, located adjacent to the Site at 2215 East River Road, in Moraine, Ohio. Building 24 is located approximately 175 feet to the east of GP09-09. TCE was not detected at concentrations in excess of the IASLs

[6] The ODH screening levels are the screening levels applicable to the VI mitigation work that the Respondents are completing for the USEPA Removal Program; however, in this report, the minimum of the USEPA RSL and ODH screening level is applied and referred to as the soil vapor screening levels (SVSLs) and indoor air screening levels (IASLs) for soil vapor and indoor air criteria, respectively.

SVSLs in the crawl space or sub-slab soil vapor samples, respectively, collected beneath the buildings between Building 24 and GP09-09 (i.e., Buildings 18 and 25).

In 2013, the Respondents completed additional TCE groundwater contamination investigation activities in the vicinity of Building 24 (*Proposed Monitoring Well and Vertical Aquifer Sampling Locations: Phase 1B and 2A (Proposal),* CRA, January 2014). The Respondents collected shallow groundwater samples (i.e., at the water table, approximately 20 to 25 ft bgs) from BH10-13 to BH24-13, located along the northern and western property boundaries of Parcel 3207 (i.e.,the parcel on which Building 24 is located) (Figure 9 in *Proposed Monitoring Well and Vertical Aquifer Sampling Locations: Phase 1B and 2A (Proposal),* CRA, January 2014). The shallow groundwater samples from these boreholes did not contain TCE at concentrations greater than the MCL or criteria protective of industrial indoor air (Figures 10 and 11 and Tables 61 and 62 in *Proposed Monitoring Well and Vertical Aquifer Sampling Locations: Phase 1B and 2A (Proposal),* CRA, January 2014). The Respondents collected samples from boreholes BH16-13 to BH18-13 at depths deeper than the water table (29.5 to 33.5 ft bgs) that contained TCE at concentrations greater than the MCL. Groundwater concentrations of TCE at the water table (approximately 20 to 25 ft bgs) were less than the MCL and criteria protective of industrial indoor air. The nearest monitoring well location where TCE has been detected in groundwater samples at concentrations that exceed the criteria protective of industrial indoor air is MW-210. Groundwater samples collected from monitoring well MW-210, located 245 ft northeast of Building 24 contain TCE at concentrations between 30 and 260 μg/L. MW-210 is screened at a depth of 26 to 36 ft bgs; which is below the water table (approximately 20.5 ft bgs at this location). During the installation of borehole VAS-21, immediately adjacent to MW-210, CRA collected a groundwater sample from the water table, which contained TCE at a concentration of 15 μg/L. Water-table groundwater samples collected from sampling locations that are side-gradient to downgradient of VAS-21 and between VAS-21 and Building 24 (i.e., BH13-13 through BH18-13) were all less than both the residential and industrial indoor air screening levels. Therefore, it is unlikely that TCE in shallow groundwater elsewhere on Site is migrating to Building 24 via preferential pathways. Building 23 on Parcel 3207 is located between Building 24 and MW-210. TCE concentrations in vapor intrusion samples collected from Building 23 were less than USEPA and ODH screening level criteria (Figure 2.23 and in *Vapor Intrusion Investigation Summary Report*, CRA, December 2012). Groundwater samples collected from boreholes BH23-13 and BH24-13, which are near GP09-09, contained TCE at concentrations that were less than VISLs. In addition, there are no known preferential pathways (e.g. utility corridors) between Building 24 and the area of GP09-09 based on CRA's visual inspections of the parcels on which Building 24 and GP09-09 are located. Based on the lack of TCE concentrations above screening level criteria in surrounding buildings (both upgradient and downgradient)

and in groundwater samples collected at the water table, the TCE detected in the sub-slab soil vapor at Building 24 does not appear to be due to migration of TCE from the Site in shallow groundwater or soil gas and does not appear to be related to the TCE detected in soil vapor at GP09-09. The source of the TCE in the sub-slab soil vapor beneath Building 24 appears to be localized to the area of Building 24.

In August 2013, the Respondents installed a sub-slab depressurization system (SSDS) into Building 24 to mitigate the sub-slab soil vapor concentrations of TCE. Hybrid proficiency sampling (i.e., indoor air and sub-slab soil vapor sampling) completed in September 2013, indicates the SSDS in Building 24 is operating successfully and has reduced the concentration of TCE in the sub-slab to less than the ODH screening level, which is the screening level applicable to the mitigation work being completed for the USEPA Removal Program. The TCE concentration measured at sub-slab probe SS-24-B (35/38 $\mu g/m^3$) in September 2012 was greater than the Industrial SVSL (8.8 $\mu g/m^3$), but was less than the ODH SVSL (100 $\mu g/m^3$). TCE was not present in indoor air samples or shallow water table groundwater samples collected in or around Building 24 at concentrations greater than screening level criteria; additionally, the TCE sub-slab concentrations in Building 24 have been mitigated to less than the ODH screening level; although, concentrations remain greater than the USEPA RSLs. The Respondents do not propose any further investigation into potential source areas for TCE on off-Site Parcel 3207; as the source of TCE in the sub-slab soil vapor beneath Building 24 does not appear to be Site-related, based on the available data,. Should data obtained during the investigations proposed herein demonstrate a potential Site-related source of the TCE at Building 24, the Respondents will propose such additional investigation as may be appropriate.

Data Gaps

CRA has identified the following data gaps in the Jim City and Ron Barnett Parcels:

- Characterization of the soil and fill material and quality (surface and sub-surface) within Parcels 3753, 4423, 4610, and 3252
- Further characterization of groundwater conditions below the fill material and along the eastern perimeter of the Jim City Parcel

- Based on the results of the soil and groundwater investigation, the Respondents will complete soil gas monitoring within the fill material and along the eastern perimeter of the Jim City and Ron Barnett Parcels if warranted[7].

2.3 GREAT MIAMI RIVER AND FLOODPLAIN AREA

Investigations of the floodplain area have involved examining the fill material conditions adjacent to the floodplain, delineated as shown on Figure 2.6. CRA has not identified any evidence of leachate seeps along the embankment of the fill material adjacent to, and nearby areas within the floodplain during Site inspections completed from September 2008 to November 2009.

The investigations and sample collection activities completed by CRA and others for the GMR and floodplain area include the following:

- Two soil samples (S08 and S10) collected from locations along the fill material boundary as shown on Figure 2.6. The analytical results are summarized in Table 2.1. The results indicate that select PAHs, thallium, lead, iron, arsenic and polychlorinated biphenyls (PCBs) were present at concentrations greater than USEPA Residential and/or Industrial RSLs.

Ohio EPA collected three sediment samples (S17, S18, and S19) from the GMR as shown on Figure 2.6. The analytical results are summarized in Table 2.3. The results indicate that select PAHs, thallium, and arsenic exceed USEPA Residential and/or Industrial Soil RSLs. CRA notes that comparison to USEPA Soil RSLs is not directly applicable to sediment.

A heavily vegetated man-made embankment, which according to Jack Boesch was constructed of fill materials, including material resembling slag, ash, and foundry-type sands, by the Site owners/operators, is present along the central (Parcel 5177) portion of the Site, and extends past the northern and western boundary of Parcel 5054, along the

[7] If required, the soil gas monitoring would include the installation of soil vapor probes between the location of any soil or groundwater impacts with the potential to result in unacceptable indoor air or ambient air risks and the potential receptors. If the soil vapor data indicate a potential exposure pathway, sub-slab, indoor air and ambient air sampling would be proposed, as appropriate. Investigations would be completed in accordance with the methodologies proposed in the FSP, QAPP, and VI Investigation Work Plan.

GMR. Portions of the berm are located on the MCD property. The grassy area between the berm and the GMR is part of the 100-year floodway and is owned by the MCD.

In November 2005, CRA observed slag and metal debris across the western surface of the embankment slope, and discrete piles of wastes consisting mostly of construction and demolition debris with insignificant amounts of municipal-type wastes on the surface at a few locations.

Data Gaps

CRA has identified the following data gaps in the GMR and floodplain area:

- Characterization of the soil conditions adjacent to the fill material boundary and the recreational trail
- Characterization of background soil conditions within the floodplain area
- Characterization of surface water quality and sediment conditions within the GMR adjacent to, and immediately downstream of, the Site
- Characterization of background surface water quality and sediment conditions within the GMR upstream of the Site

2.4 GROUNDWATER

The results of groundwater investigations conducted to date are documented in the following reports:

- Phase 1 Groundwater Report, CRA, March 2009
- Remedial Investigation Report Operable Unit 1 (OU1), CRA, April 2010
- Draft Streamlined Remedial Investigation and Feasibility Study Report for Operable Unit One (OU1), CRA, June 2011
- Draft Streamlined Remedial Investigation / Feasibility Study Report for Operable Unit One, CH2M Hill, 2012

The analytical data for groundwater at the OU2 Southern Site Parcels are contained in Appendix B.

CRA will complete further investigations to characterize groundwater conditions within the Site limit (see data gaps noted in Sections 2.1 and 2.2) and, as necessary, beyond the

limits of the OU2 Southern Site Parcels. CRA will fully identify and address these groundwater data gaps following completion of the current groundwater investigation, which is outlined in the May 10, 2013 *Final Work Plan for Operable Unit One (OU1) Groundwater and Data Gap Investigation – Phase 1A*, and the *Proposed Monitoring Well and Vertical Aquifer Sampling Locations – Phase 1B and 2A* (CRA, January 2014).

3.0 CONCEPTUAL SITE MODEL

The following presents a summary of the preliminary CSM for the Site based on human health exposure and ecological receptors. Appendix C contains the CSM.

In order to evaluate the significance of the impacted media at the Site, the potential pathways by which individuals may come in contact with the media must be determined. The combination of factors (chemical source, media of concern, release mechanisms, and potential receptors) that could produce a complete exposure pathway and lead to human uptake of chemicals at the site is assessed in the CSM.

For purposes of the preliminary CSM, two primary source areas and five potential exposure areas were considered based on current conditions.

The two primary source areas include:

- The landfill contents within the OU1 Parcels, also referred to as the Presumptive Remedy Area
- The landfill contents outside of OU1, within the OU2 Parcels

The five potential exposure areas are referenced as:

- OU1 Parcels
- OU2 Parcels
- Quarry Pond (part of OU2)
- Off-Site properties (part of OU2)
- GMR/floodplain (part of OU2)

As indicated above, the OU1 Parcels and OU2 Parcels represent both source areas and potential exposure areas. Potential receptors may include full-time workers, temporary (e.g., construction) workers, residents, and trespassers.

Other potentially exposed receptors for constituents of concern (COCs) that may migrate from the source areas include adjacent (off-Site) properties located east and south of the source areas; and the GMR/floodplain area located west and north of the source areas. This may include residents, workers, trespassers, and recreational users.

The preliminary CSM is illustrated on Appendix C. Tables C.1 and C.2 show the CSM for human health baseline conditions for OU1 and OU2 source areas, respectively.

As previously discussed in Section 1.1, the Site is in an area of mixed land use, including industrial, commercial, residential, and recreational land uses. The Site is heavily vegetated. The dominant vegetation on the Site includes black willow (*Salix nigra*), purple loosestrife (*Lythrum salicaria*), moneywort (*Lysimachia nummularia*), straw sedge (*Cyperus esculentus*), eastern cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), American sycamore (*Platanus occidentalis*), reed canary grass (*Phalaris arundinacea*), and poison ivy (*Toxicodendron radicans*). Fish and fishing activity by trespassers have been observed in the 15-acre Quarry Pond. CRA field technicians also report sightings of deer and coyotes on-Site. Table C.3 shows the CSM for ecological receptors for both source areas.

Each figure shows the primary source area, release mechanisms, secondary and tertiary sources, the exposure route, and the potentially exposed receptors. The figures also indicate the designations for operable units, in terms of which potentially complete pathways are addressed by either OU1 or OU2. In addition, the pathways being addressed by current vapor intrusion studies are also indicated.

The preliminary CSM for human health is intended to be updated and refined as additional information is collected during the RI/FS. This will include assessment of current and future conditions, and ecological receptors as necessary.

4.0 PRELIMINARY IDENTIFICATION OF RESPONSE OBJECTIVES AND REMEDIAL TECHNOLOGIES

4.1 PRELIMINARY REMEDIATION OBJECTIVES

The preliminary objectives for the remedial action at the Site[8] are identified in the SOW, which is appended to the ASAOC. As stated in the SOW, the strategy for achieving the remedial objectives and general management of the Site will include the following:

- *Conduct a remedial investigation to fully determine the nature and extent of the release of hazardous substances, pollutants, or contaminants in all Site areas and/or media not addressed by the Presumptive Remedy approach, and in all Site areas and/or media where the Respondents have not clearly indicated that there is a basis for remedial action and that a Presumptive Remedy approach is appropriate*
- *Perform a conventional feasibility study to identify and evaluate a full range alternatives for the appropriate extent of remedial action to meet the remedial action objectives, and to prevent or mitigate the migration or the release or threatened release of hazardous substances, pollutants, or contaminants of concern from the Site*
- *Gather sufficient data, samples, and other information to fully characterize Site geology, hydrogeology, the nature and extent of contamination at the Site, contaminant fate and transport mechanisms, and to support the human health and ecological risk assessments conducted for the Site*

Task 1 in the SOW identifies preliminary objectives for the remedial action at the Site.

Respondents propose the following objectives for contaminant sources and affected media in OU2.

- Eliminate, to the extent practicable, direct contact with solid waste and surface and subsurface soil that pose an unacceptable current or potential future risk to potential receptors.
- Eliminate, to the extent practicable, exposure to Site-related groundwater contaminated above MCLs that poses an unacceptable current or potential future risk to potential receptors.

[8] The Site has been defined in the SOW as an area of approximately 80 acres, including Valley Asphalt plant in the northernmost portion of the Site (Parcels 5171 through 5175), an auto salvage yard in the southeast (Parcels 753 and 4423) and a gravel pit/quarry pond (the Quarry Pond, Parcels 3274 and 5178) in the southern part of the Site.

- Eliminate to the extent practicable, exposure to contaminated surface water and sediments that pose an unacceptable current or potential future risk to the extent practicable.
- Reduce potential for exposure to Site wetland and floodplain areas that pose an unacceptable current or potential future risk to potential receptors.
- Eliminate, to the extent practicable, infiltration and resulting contaminant leaching to groundwater and surface water in areas where Site-related contaminants are currently leaching, or have the potential to leach, at concentrations that pose or would pose an unacceptable current or potential future risk to potential receptors.
- Reduce the mobility, toxicity, and/or volume of Site-related hazardous substances, pollutants, or contaminants in areas that are defined as "hot spots" to the extent practicable to protect potential receptors. Hot spots will be identified in accordance with USEPA guidance[9], at any time during the RI, Remedial Design (RD), or Risk Assessment (RA).
- Control migration of contaminated leachate that poses an unacceptable current or potential future risk to potential receptors to its beneficial use.
- Restore groundwater impacted by historic Site activities that poses an unacceptable current or potential future risk to potential receptors to its beneficial use.
- Control Site-related landfill gas and soil vapors that pose an unacceptable current or potential future risk to potential receptors.

4.2 PRELIMINARY REMEDIAL TECHNOLOGIES

In accordance with USEPA guidance, the following subsection presents preliminary general response actions and a preliminary list of remedial technology types for the Site.

4.2.1 PRELIMINARY GENERAL RESPONSE ACTIONS

In accordance with USEPA guidance (1988) general response actions are initially defined during scoping and are refined throughout the RI/FS as information is gained and action-specific ARARs are identified. General response actions for the Site may include

[9] United States Environmental Protection Agency, September 1993. *Presumptive Remedy for CERCLA Municipal Landfill Sites.* OSWER Directive No. 9355.0-49FS.

no action/institutional actions, containment, collection, excavation, treatment, disposal, or a combination of these.

4.2.2 PRELIMINARY REMEDIAL TECHNOLOGY TYPES

CRA identified several remedial technology types and process options for each applicable general response action to satisfy the objectives discussed in Section 4.1.

Following the OU2 remedial investigation, CRA will screen process options relative to technical implementability based on the OU2 Site-related contaminant types and concentrations, and other Site characteristics.

The preliminary remedial technology types and general process options are presented as follows:

- No action
- Institutional Options
- Zoning restrictions
- Deed/use restrictions
- Restrictive covenants
- Fencing/signs/markers
- Groundwater use restrictions

Containment Technologies

- Cap
- Stabilization/Solidification
- Hydraulic containment
- Physical barriers (sheet piles, grout curtains, etc.)

Removal and Extraction Technologies

- Excavation
- Drum removal
- Extraction wells
- Interceptor trenches
- LFG venting, collection, or flaring

Treatment Technologies

- Physical or Chemical Separation
- Enhanced in situ biodegradation
- Activated carbon adsorption
- Air sparging
- Permeable treatment barrier (PTB)/permeable reactive barrier (PRB)
- Biological treatment
- Chemical/ultraviolet (UV) oxidation

Discharge/Disposal Technologies

- On-Site disposal
- Off-Site disposal
- Ambient air discharge
- Reinjection
- Surface water discharge

Other Technologies

- Monitoring
- Well Abandonment
- Wetland Mitigation
- Monitored Natural Attenuation

As the OU2 RI progresses, the list of remedial technology types and process options will be refined for each medium of interest. In the FS, the options will be screened to identify those technologies to be further evaluated and combined as appropriate to develop remedial alternatives.

The Respondents will provide USEPA with letter reports following each phase of the OU2 investigation. The Respondents will notify USEPA of any additional data required to evaluate remedial alternatives in the letter reports. Determination of additional data requirements will be assessed in accordance with the applicable Data Quality Objectives (DQOs).

4.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

As stated in USEPA, 1988, "Section 121(d)(2)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) specifies that Superfund RAs meet any Federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs)." Further, "State ARARs must be met if they are more stringent than Federal requirements" (USEPA, 1988)[10].

ARARs and To-Be-Considered (TBC) criteria are defined as follows:

- Applicable Requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or state environmental laws that specifically address a hazardous substance, pollutant, contaminant, RA, location, or other circumstance found at a CERCLA site.
- Relevant and Appropriate Requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or state environmental laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, RA, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site and are well-suited to the particular site.
- To-Be-Considered Criteria consist of advisories, criteria, or guidance that were developed by USEPA, other federal agencies, or states that may be useful in developing CERCLA remedies and include non-promulgated guidance or advisories that are not legally binding and that do not have the status of potential ARARs. TBCs generally fall within three categories: health effects information with a high degree of credibility, technical information on how to perform or evaluate Site investigations or response actions, and policy.

[10] Section 121 (d)(2)(A) of CERCLA states "With respect to any hazardous substance, pollutant or contaminant that will remain onsite, if – (i) any standard, requirement, criteria, or limitation under any Federal environmental law...; or (ii) any promulgated standard, requirement, or limitation under a State environmental or siting law that is more stringent than any Federal standard, requirement, criteria, or limitation ... and that has been identified ... in a timely manner, is legally applicable to the hazardous substance or pollutant or contaminant concerned or is relevant and appropriate under the circumstances of the release or threatened of such hazardous substance or pollutant or contaminant, the remedial action selected ... shall require, at the completion of the remedial action, a level or standard of control for such hazardous or pollutant or contaminant which at least attains such legally applicable or relevant or appropriate standard, requirement, criteria, or limitation."

USEPA has divided ARARs into three categories: chemical-specific, location-specific, and action-specific, described as follows:

- Chemical-Specific ARARs are usually health- or risk-based numerical values or methodologies, which, when applied to Site-specific conditions, result in the establishment of numerical values. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment.
- Location-Specific ARARs apply to the geographical or physical location of the Site. These requirements limit where and how the RA can occur.
- Action-Specific ARARs include performance, design, or other controls on the specific activities to be performed as part of the RA for a site.

Potential ARARs and To-Be-Considered Criteria, along with a brief description of each are provided in Appendix E. The potential ARARs and TBC criteria in Appendix E are based on determinations made following OU1 RI/FS Investigations. During the OU2 RI/FS, information will be collected to assist in finalizing the preliminary evaluation of potential ARARs.

As specified in the NCP under 40 CFR Section 300.430(f)(1)(i), six circumstances under which ARARs may be waived are as follows:

(1) The alternative is an interim measure and will become part of a total remedial action that will attain the applicable or relevant and appropriate federal or state requirement

(2) Compliance with the requirement will result in greater risk to human health and the environment than other alternatives

(3) Compliance with the requirement is technically impracticable from an engineering perspective

(4) The alternative will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, or limitation through use of another method or approach

(5) With respect to a state requirement, the state has not consistently applied, or demonstrated the intention to consistently apply, the promulgated requirement in similar circumstances at other remedial actions within the state

(6) For Fund-financed response actions only, an alternative that attains the ARAR will not provide a balance between the need for protection of human health and

the environment at the Site and the availability of Fund monies to respond to other sites that may present a threat to human health and the environment

5.0 PROPOSED FIELD INVESTIGATION ACTIVITIES

5.1 DATA QUALITY OBJECTIVES

USEPA DQOs are a flexible and iterative planning process used to determine the type, quantity, and quality of data required in order to obtain defensible decisions. The DQO process consists of seven iterative steps, as follows:

- Step 1: State the Problem. Define the problem that necessitates the study: identify the planning team, examine budget and schedule.
- Step 2: Identify the Goal of the Study. State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.
- Step 3: Identify Information Inputs. Identify data & information needed to answer study questions.
- Step 4: Define the Boundaries of the Study. Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.
- Step 5: Develop the Analytic Approach. Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.
- Step 6: Specify Performance or Acceptance Criteria.
- Step 7: Develop the Plan for Obtaining Data. Select the resource-effective sampling and analysis plan that meets the performance criteria.

CRA developed DQOs for OU2, based on results of previous investigations, and data gaps. All data collected will ultimately be used in the Baseline Risk Assessment for OU2. The DQO development process is detailed in Tables 3.1 through 3.6 and summarized in the following sections. The Respondents propose to complete a series of phased investigations to assist in the characterization of various OU2 media and identify data requirements for subsequent assessment and delineation. The first phase will include investigations to determine the nature and extent of contamination, including investigations to determine the presence of contamination from other contaminated sample media (i.e., the potential for groundwater quality to be impacted due to contaminated soil or fill), while the second phase will focus on additional investigations to delineate areas of contamination or determination of risks to human health and the environment. Two phases are expected to be sufficient, based on the amount of data already available for the Site. The Respondents understand that a third phase may be necessary if delineation of contaminants to the extent required to properly assess the remedial alternatives (as per the DQOs) is not achieved in Phases 1 and 2; however, it is

not possible to determine the need for, or provide the scope of, any potential third phase at this stage. Upon completion of Phase 2, the Respondents will provide USEPA with a letter report summarizing the results, identifying any remaining data gaps, and if required, providing a Phase 3 scope of work. The Respondents will also detail any expected impacts that the need for a third phase will have on the overall schedule. To the extent possible, any Phase 3 tasks would be completed on an expedited schedule and/or concurrently with other investigative activities, in order to minimize delays to the overall schedule. Respondents will prepare and submit separate letter work plans for the investigations proposed in the following sections.

5.2 EXPOSURE UNITS

This section outlines the proposed exposure units for the OU2 Southern Site Parcels based on the property ownership boundaries, current and reasonably foreseeable future activities and land use.

The Quarry Pond Parcels include Parcels 3274, 5178 and a portion of Parcel 3275. Quarry Pond Parcel 5178 is zoned 'M-2 General Industrial'. Based on aerial photographs, extraction and sand and gravel mining operations were present on Parcel 5178 from the 1940s to the 1970s. This parcel is owned by the Grillot and Boesch Trust and is undeveloped. Parcel 5178 is 14.9 acres in size, 10 acres of which is occupied by the Quarry Pond; therefore, there are 4.9 acres of unsubmerged soil/fill/waste on Parcel 5178. The Quarry Pond also extends onto Parcel 3274. The Respondents propose to treat the Quarry Pond, i.e.,the submerged portion of Parcels 3274 and 5178, as a single exposure unit. Trespassers have been observed along the northeastern portion of the Parcel. The Respondents intend to put institutional controls, in the form of an environmental covenant, in place for OU2. Based on the historic, current, and reasonably foreseeable future use, Parcel 5178 will remain as undeveloped land. The Respondents propose to treat the northeastern portion of Quarry Pond Parcel 5178 as one exposure unit (EU1), based on current trespasser activities (Figure 5.2). EU1 is 3.3 acres in size. The Respondents propose to treat the remainder of Parcel 5178 as portions of separate exposure units, as discussed in the following paragraphs.

Based on the City of Moraine Zoning Map[11,] Parcels 3274 and 3275 are zoned 'C-Conservation'. MCD acquired Parcel 3275 in 1938 and Parcel 3274 in 1969. MCD's core mission is flood protection. The FEMA map for the area designates Parcel 3275 and

[11] City of Moraine Zoning Map, dated 3/3/2010, last accessed on 4/23/2014 at http://www.ci.moraine.oh.us/pdf/Building%20Zoning/Zoning%20Map%200408191.jpg

the western portion of Parcel 3274 as being in the floodway area (Figure 5.1). FEMA defines the floodway area as "(t)he channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1 percent annual chance flood can be carried without substantial increases to flood heights." Based on the historic and current site use, combined with the risk of flooding, Parcels 3274 and 3275 are likely to remain undeveloped in future. Further, receptors accessing Parcel 3275 and the unsubmerged portions of Parcel 3274 can access any portions of these two Parcels and given the physical terrain may well traverse the majority of the two Parcels and the western unsubmerged portion of Parcel 5178. Therefore, the Respondents propose to treat Parcel 3274, Parcel 3275, and the western unsubmerged portion of Parcel 5178 as one exposure unit (EU2) (Figure 5.2). Parcel 3274 is 6.3 acres in size; however 4.3 acres are occupied by the Quarry Pond; therefore 2.0 acres of Parcel 3274 are unsubmerged. Parcel 3275 is 0.8 acres in size, of which approximately 0.1 acres is included in the Site boundary. The western unsubmerged portion of Parcel 5178 is approximately 0.2 acres in size. Therefore, this exposure unit is comprised of 2.3 acres of undeveloped land zoned as conservation and general industrial land.

Active businesses are present on or utilize Parcels 3252, 3753, 4423 and 4610. Jim and Dave Worley have been co-owners of Parcels 3753 and 4423 since 1996 and operate Jim City Salvage, an automobile scrap and salvage yard. Parcel 3753 is 2.8 acres in size, and Parcel 4423 is 3.5 acres in size. Narrow unsubmerged portions of Parcel 5178 abut both Parcels 3753 and 4423 and have been incorporated into the automobile scrap and salvage yard. In the reasonably foreseeable future, the land use is expected to remain unchanged; however, should the property be sold in future, the potential exists that the property could be sold as two separate parcels. The Respondents intend to put institutional controls, in the form of an environmental covenant, in place for OU2 that would restrict future use of the Parcels to industrial/commercial uses. Based on the property boundaries, the Respondents propose to treat Parcel 3753 and the adjacent unsubmerged portion of Parcel 5178 as one exposure unit, EU3 (3.0 acres), and Parcel 4423 and the adjacent unsubmerged portion of Parcel 5178 as a separate exposure unit, EU4 (3.6 acres).

Parcels 3252 and 4610 are owned by Ron Barnett. Parcel 3252 is 0.3 acres in size and is used as a driveway to access Parcel 4610, which is 2.0 acres in size. There are five buildings on Parcel 4610, which are rented by various tenants for different uses including storage, car repair, or as an office/residential trailer. As multiple tenants use Parcel 4610, they are not necessarily exposed to and will not necessarily traverse the entire property. Thus, the Respondents propose to treat Parcel 4610 as four exposure units, ranging from 0.5 to 0.9 acres in size (EU5 - EU8) (Figure 3.1b). The Respondents propose to treat the Parcel 4610 residential trailer area and driveway as its own exposure

unit (EU5, 0.5 acres) as the driveway is narrow and any residential receptors would be expected to be exposed to the entirety of the driveway and the area immediately surrounding the trailer. As noted above, it is expected that in future, residential use of the on-Site parcels will be restricted; however, given the presence of the residential trailer, the possibility of residential use of EU5 will be considered in the OU2 RI/FS.

A recreational trail spans Parcels 3056, 3057, 3058, and 3278. These parcels are owned by MCD. Based on MCD's mission of flood protection, and based on the location of these parcels within a FEMA floodway area, there is no expected change in land use in the reasonably foreseeable future. Users of the recreational trail may reasonably be expected to be exposed to the entire length of the trail. The Respondents propose to treat the floodplain, including the recreational path, as a single exposure unit for the purposes of near-Site floodplain soil sample collection.

5.3 OU2 PARCELS SOIL AND FILL INVESTIGATION

The objectives of the Soil and Fill Investigation within the OU2 Parcels include:

- Determination of the lateral and vertical extent of the contaminated soil and fill material to support the overall site assessment
- Characterization of the nature of contaminated soil and fill (i.e., inert fill and/or waste) material (surface and subsurface) to identify direct contact, inhalation, and ingestion risks, for input to the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)
- Determine if contaminant concentrations are from historical Site activities or are due to elevated background concentrations (either naturally occurring or anthropogenic regional contamination), based on a comparison to background soil sample analytical results

DQOs for soil and fill within OU2 are presented in Table 3.1.

The Phase 1A investigation of the soil and fill within OU2 will include surface and subsurface soil sample collection and analyses to identify direct contact, inhalation, and ingestion risks as outlined below:

- Completion of approximately 12 soil borings within EU1 (northeastern portion of Parcel 5178) at the approximate locations shown on Figure 3.1a

- Completion of approximately 12 soil borings within EU2 (Parcels 3274 and 3275 and the unsubmerged western portion of Parcel 5178, at the approximate locations shown on Figure 3.1a
- Completion of approximately 12 soil borings within EU3 (Parcel 3753 and adjacent unsubmerged portion of Parcel 5178) at the approximate locations shown on Figure 3.1a
- Completion of approximately 12 soil borings within EU4 (Parcel 4423 and the adjacent unsubmerged portion of Parcel 5178) at the approximate locations shown on Figure 3.1a
- Completion of approximately 8[12] soil borings within each of the four exposure units on Parcel 4610 at the approximate locations shown on Figure 3.1b
- Collection of continuous samples to log the subsurface conditions, through the entire thickness of the fill material and up to approximately 5 feet into the underlying native material, or to 15 feet below ground surface (ft bgs), whichever occurs last
- Collection of unsaturated soil and/or fill/waste samples from a minimum of 24 locations (i.e., 3 regularly spaced locations per exposure area) from a depth greater than 15 ft bgs to investigate potential leaching threats to groundwater at the approximate locations shown on Figures 3.1a and 3.1b. The Respondents will collect additional samples at locations where field observations indicate that evidence of contamination below 15 ft bgs may be more significant or different from the previous sample intervals.
- Collection and analyses of soil/fill samples for laboratory analysis (Target compound list (TCL) volatile organic compounds (VOCs), TCL semi-VOCs (SVOCs), TCL pesticides/polychlorinated biphenyls (PCBs), TCL herbicides, TAL metals, and cyanide) from each soil boring from the following unsaturated intervals:
  - 0 to 2 ft bgs
  - 2 to 15 ft bgs
  - 15 ft bgs (collected from a minimum of 24 soil borehole locations, not each soil borehole).
  - Collection of additional soil and/or fill/waste samples if field screening indicates the potential for contamination (i.e., visual observations of staining, odor, positive Sudan IV dye test, or greater than 50 ppm of undifferentiated VOCs based on PID readings)

[12] The Respondents advanced boreholes in 2013 for the Phase 1A groundwater and data gap investigation; these boreholes are included in the total number of soil borings proposed for Parcel 4610

- Field screening indicators include:
    - Presence of fly ash, foundry-type sands, slag-like material or staining, indicative of potential metals and PAH contamination
    - Presence of staining and/or odor characteristic of petroleum and chemicals, including pesticides and herbicides; indicative of potential SVOC, PCB, pesticides/herbicides contamination
    - Presence of identifiable storage containers (e.g., drums, pails, etc.) and transformer or electrical switch gear carcasses, indicative of potential SVOCs/pesticides/herbicides, or PCB contamination, respectively

Phase 1B consists of an off-Site background soil investigation that will be completed concurrently with Phase 1A. The Respondents will collect a minimum of 10 background soil samples (total) from nearby properties, if accessible, and which are not associated with current or historic industrial activity. The data collected from the soil sampling locations in the OU2 Parcels (Phase 1A) will be compared to background conditions to determine if there are any measureable inputs of contaminants from the Site, or if contaminant concentrations are due to naturally occurring or anthropogenic background concentrations; and if there are any cancer/health or ecological risks posed by the Site. Background concentrations will not be used to screen out parameters as COPCs for the Site.

Phase 2 consists of additional sampling, if necessary, to develop risk assessment exposure estimates. If soil containing contaminant concentrations greater than performance and/or acceptance criteria is found in Phases 1A and 1B, additional soil samples may be required to establish the presence or absence of direct contact, inhalation, and ingestion risks to human health receptors via exposure pathways.

5.4 SOIL VAPOR MONITORING

The Phase 1 investigation of OU2 soil vapor is the same as the Phase 1A Soil and Fill Investigation (discussed in Section 5.2) and Phase 2 of the Groundwater Investigation (discussed in Section 5.7). The Respondents will evaluate the Phase 1A Soil and Fill Investigation data, including any visual or olfactory observations of potential contamination, as well as the Phase 2 Groundwater Investigation analytical results that are greater than vapor intrusion screening levels (VISLs). Phase 2 of the soil gas investigation will consist of soil gas probe investigations, if necessary.

Following Phase 1 of the soil gas investigation (i.e., Phase 1A soil and fill investigation and Phase 2 of the groundwater investigation), the Respondents will provide a description and rationale for proposed soil gas probe locations, if deemed necessary, to USEPA for review prior to implementing the work. Conversely, the Respondents will submit a letter summarizing the rationale against further soil gas investigation should the data show that an investigation is not necessary.

In order to further assess soil gas conditions within the OU2 fill material, if necessary, CRA will install temporary soil gas probes at selected locations (in accordance with Field Sampling Plan Appendix J-F-33: Gas Probe Installation, (CRA, 2013) The probes will be used for soil gas monitoring, augmenting the existing probes located within the OU2 Parcels, to determine the presence of VOCs, at concentrations that pose potential risks to current and future occupants of off-Site structures, and explosive gases, at concentrations greater than screening or regulatory criteria, using laboratory analysis and field instruments. The Respondents will sample any newly installed soil gas probes in accordance with the standard operating procedures detailed in FSP Appendix J-F-11 (CRA, 2013).

The Respondents completed vapor intrusion investigations in all buildings on and immediately adjacent to the Site for which access was granted. The Respondents installed a mitigation system in the one building adjacent to the OU2 Southern Site Parcels that was identified to exhibit an incomplete vapor intrusion pathway, Building 24 (Globe Equipment). If requested, vapor intrusion samples will be collected from any location where occupants previously denied access or any new locations that may be identified as requiring sampling.

The Respondents will assess the need for further soil gas monitoring within or beyond the fill material limits, including sub slab soil vapor, indoor air, outdoor air or crawl space sampling, based on the results of the initial monitoring. If necessary, further sampling will be completed in accordance with Tier 3 of the OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (USEPA, 2002). If necessary, the Respondents will provide a description and rationale for any further soil gas or vapor intrusion investigations (i.e., Phase 3 soil gas investigation), or mitigation to USEPA for review prior to implementing the work.

The potential for future vapor intrusion pathways exists in OU2 if new buildings are constructed. Given that the location and nature of any potential new buildings cannot be foreseen at present and that environmental conditions may change over time (i.e., as contaminants migrate, degrade, are capped, etc.), the Respondents do not propose to

complete an investigation to identify potential future vapor intrusion risks to future buildings. In the case of future building construction in OU2, institutional controls will require the Respondents or the entity proposing the construction of the new building to evaluate the potential for VI exposure pathways prior to the start of construction. Remedial Investigation/Feasibility Study activities will need to take institutional controls into account.

5.5 QUARRY POND INVESTIGATION

The objectives of the Quarry Pond investigation include:

- Determination if non-native material exists at the base of the Quarry Pond (to determine if the operators filled the area in prior to the formation of the pond)
- Characterization of surface water quality as input to the HHRA and ERA
- Characterization of sediment quality as input to the HHRA and ERA

DQOs for surface water and sediment are presented in Tables 3.4 and 3.5, respectively.

The investigation of the Quarry Pond will include surface water and sediment sampling to determine the extent and magnitude of contamination, and identify direct contact risks and risks to potential ecological receptors as outlined below:

- In accordance with Phase 1A–QP of the sediment investigation (Table 3.5), Quarry Pond sediment samples will be collected at approximately nine locations, as shown on Figure 3.2. The sample locations may be adjusted based on the locations of intermittent drainage pathways, storm water runoff pathways, if any are identified, and the results of underwater survey inspections conducted by Ohio EPA, Ohio DNR and the Attorney General's Office - Bureau of Criminal Investigation's office, to include consideration of any areas where foreign objects may have been deposited and the likelihood of sediment contamination may be greater. Only one round of sediment sampling is proposed as short-term temporal variation in sediment contaminant concentrations is expected to be limited. The Respondents will evaluate the sediment sample results and propose additional sampling, if required (i.e., to further evaluate any observed spatial differences, or further define the extent and magnitude of contamination).
- To identify potential risks to human health, areas easily accessible to humans and with evidence of use will be targeted for sediment sample locations (e.g., areas where anglers, recreational users, or trespassers are present; areas where water is

approximately 3 ft deep or less, and where sediment can support body weight). To identify potential ecological risks, areas of deposition (i.e., soft substrates) will be targeted for representative sediment sample locations.

- Each sediment sample will be collected from the upper (available) layer of sediments (0 - 6 inches below sediment/water interface) material and ii) subsurface sediment (greater than 6 inches below sediment/water interface).
- Each sediment sample will be analyzed for TCL VOCs, TCL SVOCs (including PAHs), TCL pesticides, TCL herbicides, TAL metals, simultaneously extractable metals (SEM) for divalent metals (copper, cadmium, lead, mercury, nickel, and zinc), and total metals, (including arsenic, manganese, iron), as well as organic carbon, black carbon, major anions (chloride, fluoride, cyanide, nitrate, nitrite, sulphate, and sulphide), indicator parameters (pH, temperature, conductivity, oxidation reduction potential [ORP], dissolved oxygen [DO]), and reduction-oxidation (REDOX) parameters. In accordance with Phase 1C of the surface water investigation (Table 3.4), Quarry Pond surface water samples will be collected at approximately five locations as shown on Figure 3.2. The surface water sample locations will be adjusted based on the location of intermittent drainage pathways from storm water runoff, if any are identified.
- Surface water samples from approximately 5 locations, in each of two sampling rounds, within the Quarry Pond as shown on Figure 3.2. Two sampling rounds are proposed to accommodate for potential seasonal changes. The Respondents propose to collect one round of surface water samples in spring, when the water from the GMR may be recharging the Quarry Pond; and one round in summer; when both bodies of water are at seasonally low elevations and exist in equilibrium and groundwater is expected to be recharging the GMR. The surface water sample locations will be adjusted based on the location of intermittent drainage pathways and Quarry Pond discharge points, if any are identified. The data from each sampling event will be treated as discrete sampling results, and will not be averaged between the two events.
- Each surface water sample will be collected from approximately the mid-point of the water column and analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL herbicides, TAL metals and general chemistry parameters.

Based on the results of the Phase 1A-QP sediment and Phase 1C surface water investigations discussed above, the Respondents will determine the need for additional (Phase 2) data collection. This may include, for example, collection of surface water and sediment samples from background locations; additional sample collection from the Quarry Pond to refine the distribution of COCs; delineate surface water and/or

sediment impacts, remove data gaps or to develop risk assessment exposure estimates. The Respondents will submit a summary, discussion and interpretation of Quarry Pond surface water and sediment results, and recommendations for any additional Quarry Pond investigation, if necessary.

5.6 FLOODPLAIN INVESTIGATION

The objectives of the Floodplain investigation include:

- Characterization of the surface soil as input to the HHRA and ERA
- Determine if potential Floodplain soil contamination is a result of migration from the Site

DQOs for soil within the Floodplain are presented in Table 3.6.

The Phase 1A investigation of the GMR floodplain will include soil sample collection and analyses from the floodplain to identify direct contact risks as outlined below:

- Surface soil samples will be collected at approximately 15 locations within the floodplain within and adjacent to the Site boundary as shown on Figure 3.3
- At each location soil samples will be collected from two depth increments, i.e., 0 to 0.5 ft bgs and 1 to 3 ft bgs, which is relevant for data use in the OU2 RI Report and in the HHRA and ERA
- Samples will be submitted for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TCL herbicides, and TAL metals analyses

Phase 1B consists of an off-Site background soil investigation that will be completed concurrently with Phase 1A. Surface soil samples will be collected at approximately ten locations within the floodplain upstream of the Site to establish local background locations. The data collected from the soil sampling locations in the floodplain (Phase 1A) will be compared to background conditions to determine if there are any measureable inputs of contaminants from the Site, or if contaminant concentrations are due to naturally occurring background concentrations.

Phase 2 consists of additional sampling, if necessary, to develop risk assessment exposure estimates. If soil contains contaminants at concentrations greater than performance and/or acceptance criteria is found in Phases 1A and 1B, additional soil samples will be collected to delineate soil impacts or to remove data gaps. The

Respondents will submit a summary, discussion and interpretation of floodplain surface water and sediment results, and recommendations for any additional floodplain investigations, if necessary.

5.7 GMR INVESTIGATION

The objectives of the GMR investigation include:

- Determine if the Site has any measureable impact on sediment and surface water quality in the GMR
- Characterization of the surface water quality as an input to the HHRA and ERA
- Characterization of sediment quality as an input to the HHRA and ERA

DQOs for GMR surface water and sediment are presented in Tables 3.4 and 3.5, respectively.

The Phase 1A investigation of the GMR will include surface water and sediment sampling to identify direct contact risks and risks to potential ecological impacts as outlined below:

- Sediment samples from approximately 12 locations, in one round, within the GMR adjacent to the PRA and OU2 Parcels as shown on Figure 3.4. The sediment sample locations may be adjusted based on the location of intermittent drainage pathways (if any). Only one round of sediment sampling is proposed as short-term temporal variation is sediment contaminant concentrations is expected to be limited. The Respondents will evaluate the sediment sample results and propose additional sampling, if required (i.e., to further evaluate any observed spatial differences, or further define the extent and magnitude of contamination).
- To identify potential risks to human health, areas easily accessible to humans and with evidence of use will be targeted for sediment sample locations (e.g., areas where anglers, recreational users, or trespassers are present; areas where water is approximately 3 ft deep or less and where sediment can support body weight). To identify potential ecological risks, areas of deposition (i.e., soft substrates) will be targeted for representative sediment sample locations.
- Each sediment sample will be collected from two target areas: i) the upper (available) layer of sediments (0 - 6 inches below sediment/water interface) material and ii) subsurface sediment (greater than 6 inches below sediment/water interface).

- Each sediment sample will be analyzed for TCL VOCs, TCL SVOCs (including PAHs), TCL pesticides, TCL herbicides, TAL metals, SEM for divalent metals (copper, cadmium, lead, mercury, nickel, and zinc), and total metals, (including arsenic, manganese, iron), as well as organic carbon, black carbon, major anions (chloride, fluoride, cyanide, nitrate, nitrite, sulphate, and sulphide), indicator parameters (pH, temperature, conductivity, oxidation reduction potential [ORP], and dissolved oxygen [DO]), and reduction-oxidation (REDOX) parameters.
- Surface water samples from approximately 12 locations, in each of two sampling rounds, within the GMR adjacent to the PRA and OU2 Parcels as shown on Figure 3.4. Two sampling rounds are proposed to accommodate for potential seasonal changes. The Respondents propose to collect one round of surface water samples in spring, when the water from the GMR may be recharging the Quarry Pond; and one round in summer; when both bodies of water are at seasonally low elevations and exist in equilibrium and groundwater is expected to be recharging the GMR. The surface water sample locations will be adjusted based on the location of intermittent drainage pathways and GMR discharge points, if any are identified. The data from each sampling event will be treated as discrete sampling results, and will not be averaged between the two events.
- CRA will collect each surface water sample from approximately the mid-point of the water column and analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TCL herbicides, and TAL metals parameters

Phase 1B consists of an upstream background GMR surface water and sediment investigation that will be completed concurrently with Phase 1A. Sediment samples from three transects and surface water samples collected from two transects regularly spaced upstream of the Site will be collected during one sampling round. The background sample area is localized to the area immediately upriver of the Site and downstream of the low head dam, in order to determine background effects upstream of the Site from surface water and sediment media that is of the same quality, due to mixing, as the media adjacent to the Site. The Respondents will evaluate the sediment sample results and propose additional sampling, if required (i.e., to further evaluate any observed spatial differences). The presence of significant historical industrial activity further upstream, including the former Delphi facility, may have contributed and may still be contributing contamination to the sediment and surface water upstream of the Site. Collection of samples upstream of these potential contaminant sources might therefore not be representative of conditions immediately upstream of the Site and might result in contamination from other sites being attributed to the South Dayton Site. In addition, the presence of the low-head dam may result in the retention of some sediment behind the dam and results in a lithology that is different from below the dam

and adjacent to the Site. The data collected from the GMR surface water and sediment sampling locations (Phase 1A) will be compared to background conditions to determine if there are any measureable inputs of contaminants from the Site, or if contaminant concentrations are due to naturally occurring background concentrations. Upstream background sample locations will be collected along transects regularly spaced upstream of the Site and downstream of the dam.

Phase 2 consists of additional sampling, if necessary, to develop risk assessment exposure estimates. Based on the results of the Phase 1A and 1B investigations discussed above, CRA will determine the need for additional data collection. This may include, for example, additional surface water or sediment sampling in the river to refine the distribution of COCs; and benthic studies to assess possible ecological receptors. The Respondents will submit a summary, discussion and interpretation of GMR surface water and sediment results, and recommendations for any additional GMR investigations, if necessary.

5.8 GROUNDWATER INVESTIGATION

CRA will propose the scope of an OU2 Groundwater Investigation following completion of the Phase 1A OU2 Soil and Fill investigation (Table 3.1, Phase 1A), and based on the results of the 2013 Phase 1A Groundwater Investigation, which were presented in the *Proposed Monitoring Well and Vertical Aquifer Sampling Locations – Phase 1B and 2A (Proposal)* (CRA, January 2014). Following completion of Phase 1A OU2 soil and fill investigation and the proposed Phase 1B monitoring well and Phase 2A VAS investigations, the Respondents will provide a description and rationale for proposed OU2 groundwater locations to USEPA for review prior to implementing the work. OU2 groundwater locations will be proposed in areas of potentially unacceptable risks (i.e., contain unsaturated soil contaminants of concern at concentrations greater than USEPA soil screening levels (SSLs) for groundwater protection or Ohio EPA leach-based soil values; proximity of contaminants to the Site boundary). The OU2 Groundwater investigation will include groundwater sampling at depths below 675 AMSL.

In accordance with discussions between USEPA and Respondents, a perimeter groundwater monitoring system will be installed and utilized to investigate site-related groundwater contamination and potential impacts to off-Site areas. The scope of the perimeter monitoring system will be determined based on the results of the investigations proposed herein, the results of the Phase 2 Groundwater Investigation proposed in the *Proposed Monitoring Well and Vertical Aquifer Sampling Locations: Phase 1B*

and 2A (Proposal) (CRA, January 2014) and future discussions and agreement between USEPA and Respondents.

6.0 BACKGROUND COMPARISONS

For elements of the investigation requiring a comparison to background (e.g., upgradient or upstream) conditions, the following methodology will be used. Such comparisons are noted particularly for the following investigation elements, but the methodology presented herein may also be applied to additional items, if identified during the course of the investigation.

- Southern Parcels Soil, Phase 1B (Comparison to Background)
- GMR Surface Water, Phase 1B (Comparison to Upstream)
- GMR Sediment, Phase 1B (Comparison to Upstream)

The purpose and methods for attributing contamination to an off-Site source may be different than those for making comparisons to background. CRA will factor in the possibility of widespread contamination, naturally-occurring parameters; and ubiquitous anthropogenic contaminants, etc. prior to making a determination.

The constituents that will be included for background comparisons are metals and PAHs for soils; and all analyzed parameters for surface water and sediment. CRA will collect soil/fill samples from 0-2 ft bgs and compare the analytical data to background soil/fill sample data from the same depth for metals and PAHs. This comparison to background is proposed because metals and PAH contamination may be due to regional atmospheric deposition from industrial and coal-burning activity in the broader surrounding area of the Site and any impacts would be expected in the upper layers of soil. CRA will collect soil/fill samples from 2-15 ft bgs and compare the analytical data to background sample data from the same depth for metals.

Figure 3.4 presents background surface water and sediment sampling locations for the GMR. Figure 3.5 presents proposed background soil sampling locations. Background reference soil sampling locations will be identified in areas outside a reasonable zone of potential influence (via surface runoff or substantial airborne dust deposition) for the Site and based on areas that have had little or no industrial impact (i.e., Carillon Park to the east and the cemetery to the north). The two additional background locations outlined in Figure 3.5, (i.e., northern part of Parcel 3264 and the area to the west of the site, adjacent to the GMR) are areas that have no known history of industrial use or dumping. A review of historical aerial photographs compiled in Remedial Investigation Report: Operable Unit 1 (CRA, 2010) indicates that Parcel 3264 was undeveloped and possibly used for agriculture from the 1950s to the 1970s, before becoming heavily forested in the late 1980s. There is no visual evidence in the aerial photographs that

landfilling or excavation activities from the SSDL to the north or industrial activities from companies to the south encroached onto Parcel 3264. CRA will cease sampling activities if potential contaminants and/or non-native fill material are identified at any of the background sampling locations. The Respondents will submit letter work plans to USEPA for each sample media; the letter work plans will include details on the proposed background sample locations.

6.1 BACKGROUND COMPARISON APPROACHES

Evaluation of site vs. background conditions using environmental quality data is typically carried out using either group-based or individual-based statistical comparisons. Group-based comparisons pool the data from a number of samples collected at a site (e.g., from within an area of interest) and contrast these against a pooled set of background samples. In such a case, a determination may be made as to whether or not the site area of interest as a whole is consistent with or above background conditions. In contrast, individual-based comparisons make a decision (i.e., consistent with or above background) for each investigative location at the site. In terms of the different elements of the proposed investigations, group-based background comparisons may be applicable for portions of the baseline risk assessment, but the majority of testing will consider individual point comparisons (site vs. background) for the purposes of identifying and delineating potential areas of the site that appear to have contaminants present above background conditions.

For individual-based comparisons against background, the statistical approaches employed typically establish an expected range (e.g., 95th or 99th percentile) of contaminant concentrations based on the background sample results, against which the site data compared. A site result falling outside of the expected background range is identified as being potentially impacted, and is further evaluated to confirm this finding (e.g., using confirmatory sampling or considering the spatial patterns of results in other site samples collected nearby). Confirmation is required due to the statistical nature of the background expected range calculations, which result in infrequent occurrence of background conditions outside of the range (e.g., 1 in 20 background samples for a 95th percentile range, or 1 in 100 for a 99th percentile range).

For group-based comparisons against background, the statistical approaches employed typically compare the site and background groups based on distributional characteristics (e.g., mean, median, or percentile values) through the use of hypothesis testing. In carrying out such tests, statistically-significant findings provide strong evidence that

contaminant concentrations found in the area of the site considered are different than those present in background areas.

When designing and implementing an environmental investigation where background comparisons are to be made, it is important to try to match background sampling media to those present at the site, as far as is possible. That is, matching soil types/textures, including multiple soil types if necessary due to site stratigraphy, groundwater aquifers, etc. This prevents the finding of differences between site and background conditions due to factors unrelated to activities at the site (e.g., different native mineralogy in different soil layers under a site).

6.2 RELEVANT GUIDANCE AND REFERENCES

The issue of appropriate background comparison techniques is discussed in numerous guidance and environmental statistic texts. The methods proposed for the investigations have been selected for consistency with the following documents.

- USEPA, June 1994. Statistical Methods for Evaluating the Attainment of Cleanup Standards. Volume 3: Reference-Based Standards for Soil and Solid Media. Environmental Statistics and Information Division (2163), Office of Policy, Planning, and Evaluation. EPA 230-R-94-004.
- NAVFAC, 2004. Guidance for Environmental Background Analysis. Volume III: Groundwater. Naval Facilities Engineering Command. User's Guide UG-2059-ENV. Port Hueneme, California.
- USEPA, September 2002. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (OSWER 9285.7-41). Office of Emergency and Remedial Response, United States Environmental Protection Agency, Washington, DC. EPA/540/R-01/003.
- USEPA, February 2006. Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S). Office of Environmental Information, United States Environmental Protection Agency, Washington, DC. EPA/240/B-06/003. [Available at http://www.epa.gov/QUALITY/qs-docs/g9s-final.pdf]. [Section 3.3 in particular].
- USEPA, March 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. Office of Resource Conservation and Recovery, Program Implementation and Information Division, United States Environmental Protection Agency Washington, DC. EPA 530-R-09-007. [Chapter 5 and elsewhere].

- USEPA, September 2013. ProUCL Version 5.0.00 Technical Guide. United States Environmental Protection Agency, Office of Research and Development, Washington, DC. EPA/600/R-07/041. [Chapters 3 and 5].
- USGS, 2002. Statistical Methods in Water Resources. By D.R. Helsel and R.M. Hirsch. Chapter A3 of Book 4, Hydrologic Analysis and Interpretation in Techniques of Water-Resources Investigations of the United States Geological Survey. [Available at http://pubs.usgs.gov/twri/twri4a3/]. [Chapter 3].

For the purposes of individual-based background comparisons (e.g., used in detection monitoring or for delineation of contamination), a general approach found though these references is to use a statistical tolerance or prediction limit to establish a background threshold value (BTV), which is the upper[13] expected range of background concentrations given by a certain percentile of background (e.g., 95th or 99th). Consequently, for elements in the present investigation where individual-based background comparisons are required, BTVs based on statistical upper tolerance limits (UTLs) for the 95th and/or 99th percentile of background have been selected for use. A detailed discussion of UTL calculation methods is found in Chapters 3 and 5 of USEPA's ProUCL version 5.0.00 technical guide (2010, see list above).

For the purposes of group-based background comparisons (e.g., when comparing contaminant concentration within an area of concern vs. background as part of a risk assessment), different hypothesis tests are available in the references above. Where certain statistical assumptions are met by the data sets considered (e.g., normal distribution, homogeneity of variance), parametric statistical tests are available (e.g., analysis of variance, Student *t*-test). Where these assumptions are not met by the available data, analogous non-parametric (rank-based) statistical methods are available (e.g., Mann-Whitney/Wilcoxon Rank-Sum test, modified Quantile test). Where required for the present investigation, statistical group comparisons will be carried out using the Mann-Whitney/Wilcoxon Rank-Sum test and modified Quantile test, supplemented by the Student *t*-test where assumptions of the parametric test are met.

[13] In certain cases, a lower limit may also be considered, e.g., for pH or oxygen content in water, but upper limits are much more commonly encountered.

6.3 STATISTICAL CONSIDERATIONS

In order to achieve an appropriate and successful statistical comparison of site and background conditions, a number of factors will be considered during sampling design and data analysis. These factors include:

- Background sample size – a minimum of eight to ten background samples will be collected for each environmental medium, as applicable (soil, sediment and/or surface water), and/or stratum within the medium (e.g., different soil types and/or aquifers).
- The desired minimum confidence level to be used in the statistical comparisons is 95 percent (i.e., statistical significance of $\alpha = 0.05$).
- The specific statistical method used needs to be appropriate for the observed characteristics of the site and/or background data sets obtained. This requires assessing each data set for the following statistical parameters:
  - Percentage of non-detect values
  - Statistical data distribution (e.g., testing for normal, gamma and lognormal distributions, per USEPA's ProUCL version 5.0.00 software's approach)
  - Statistical outliers (particularly in background data sets)
- QA/QC samples – where field duplicate samples are collected and submitted for laboratory analysis, the resulting data will be averaged prior to statistical calculations in order to avoid over-weighting the sampling location where duplicates were collected.
- Confirmatory analysis and/or resampling – for point-based background comparisons using BTVs, it is recognized that periodic occurrence of parameter concentrations above a BTV are expected by natural variation in the background population (e.g., 1 in 20 samples for a 95th percentile based BTV). Where a site observation exceeds the 95th percentile BTV, it will additionally be compared to a 99th percentile BTV. If the result falls below the 99th percentile BTV, and no spatially- adjacent observations also exceed the 95th percentile BTV, the site observation will be considered to not indicate a site-related effect. However, if the site result exceeds the 99th percentile BTV or another adjacent site result also is above the 95th percentile BTV, then it will be considered to indicate an above-background condition, unless a confirmatory resample is collected and found to not be above the BTV.

6.4 SUMMARY OF STATISTICAL METHODS SELECTED FOR BACKGROUND COMPARISONS

In consideration of the information presented above, as well as the objectives of the present investigation as detailed in the DQO tables, the following methods will be used for comparing contaminant concentrations in environmental samples collected at the site against concentrations observed in ambient background samples.

1. For point-based comparisons (i.e., as described for Phases 1B of the different investigations described in the DQO tables for all media except soil gas), BTVs will be calculated using the available background data:
   - If greater than half of the background data are non-detects, or if a background data set is not found to follow a discernible statistical distribution, then a non-parametric UTL on the 95th percentile of background (with 95 percent confidence) will be generated for use as the BTV. This will be done following the methods in USEPA's ProUCL version 5.0.00 software (USEPA, 2013).
   - If no more than half of the background data are detects and a discernible statistical distribution (normal, gamma or lognormal) is found, then a parametric UTL on the 95th percentile of background (with 95 percent confidence) will be generated for use as the BTV. This will be done following the methods in USEPA's ProUCL version 5.0.00 software (USEPA, 2013).
   - Individual site data will be compared against the BTVs:
     - Where a site observation exceeds the 95th percentile BTV, it will additionally be compared to a 99th percentile BTV
     - If the result falls below the 99th percentile BTV, and no spatially-adjacent observations also exceed the 95th percentile BTV, the site observation will be considered to not indicate a site-related effect
     - However, if the site result exceeds the 99th percentile BTV or another adjacent site result also is above the 95th percentile BTV, then it will be considered to indicate an above-background condition, unless a confirmatory resample is collected and found to not be above the BTV

To summarize, the following decision matrix will be used for interpreting the results of point-based comparisons against background:

Comparison Result	*Conclusion*
Below 95th percentile BTV	Not above background
Above 99th percentile BTV	Above background
Between 95th and 99th percentile BTVs:	
- no adjacent sample above 95th percentile BTV	Not above background
- adjacent sample above 95th percentile BTV	Above background

2. For group-based comparisons (i.e., as described for Phase 2 of the GMR sediment investigation, if necessary, and potentially as well a part of the baseline risk assessment):
   - For cases where a particular analyte has not been detected in either background or site samples, no statistical testing will be carried out.
   - If both the site and background data sets contain few non-detects (less than 10 to 15 percent), and follow a normal data distribution, the non-detects will be substituted with a value of one-half their detection limit and the two groups compared using a Student's t-test at 95 percent confidence.
   - In all cases where the site and background data sets combined contain up to 50 percent non-detects, non-parametric testing will be carried out contrasting the two groups using the Mann-Whitney/Wilcoxon Rank-Sum test and the modified Quantile test, at 95 percent confidence. For cases where a Student t-test has already been performed, this will be considered as a confirmatory test.
   - For the remaining cases where an analyte has been detected in one or more samples, but in less than half of the samples in the pooled site and background data sets, alternate statistical comparisons will be carried sought on a case-by-case basis. This could include procedures such as a test of proportions in conjunction with the modified quantile test.

To summarize, the following decision matrix will be used for interpreting the results of group-based comparisons against background:

Data characteristics†	***Test Performed***	***Result & Conclusion***
No detects	None	Not above background
≤15% Non-detects and normal distributions	Student's *t*-test	If significant result with Site > background: → Above background Otherwise: → Not above background
≤ 50% Non-detects	Mann-Whitney/WRS & Quantile test	If one or both tests have significant result with Site > background: → Above background Otherwise: → Not above background
> 50% Non-detects	Case-by-case selection (e.g., Quantile test & test of proportions)	If a significant result with Site > background: → Above background Otherwise: → Not above background

Note:

†– For the combined Site and background data set

The DQO Tables (Table 3.1 to 3.6) specify whether the Respondents will apply individual-based or group-based comparisons.

7.0 BASELINE RISK ASSESSMENT AND ECOLOGICAL RISK ASSESSMENT

Major components of the Baseline Risk Assessment (BRA) include constituents of potential concern identification, exposure assessment, toxicity assessment, and human health and ecological risk characterization.

Baseline Human Health Risk Assessment

CRA proposes to conduct the HHRA (or BRA) in accordance with *Risk Assessment Guidance for Superfund (RAGS Parts A-F)*. These guidance documents, along with the *Exposure Factors Handbook* and recent *Cancer Risk Assessment* guidelines, are the default guidance documents for risk assessment under CERCLA. There are four key steps to the HHRA process: Data Collection and Evaluation, and Hazard Identification; Exposure Assessment; Toxicity Assessment; and Risk Characterization.

Data Collection and Evaluation, and Hazard Identification

Adequate definition of the Site characteristics and the nature and extent of impacts is an integral component of any risk assessment and is required to reduce uncertainty in the risk assessment findings. The selection of chemicals of potential concern (COPCs) will follow USEPA RAGS Part A, and all chemicals will be screened against the most recent/current USEPA RSLs. Additionally, soil gas and groundwater data will be screened against the most recent USEPA/ODH VISLs. For each medium, chemicals with maximum concentrations less than their respective screening value will not be identified as COPCs, and will not be retained in the HHRA quantitative process. Prior to the preparation of the HHRA and submission of RAGS D Tables 7 through 10, the Respondents will submit an interim deliverable in Microsoft Excel format consisting of RAGS D Tables 1 through 6, and an appendix presenting the electronic database. For detected analytes with no screening values, the Respondents will contact USEPA to request surrogate chemicals (as appropriate) for screening purposes. Analytes that are 100 percent not detected in an environmental medium, but have screening levels will be presented in a HHRA appendix and included in HHRA discussion with respect to uncertainty analysis.

Exposure Assessment and Documentation

In the exposure assessment, analysis of contaminants through various exposure pathways will be conducted to determine which pathways and routes of exposure are the most significant. This will include an analysis of the presence, fate, and transport of

contaminants, and a discussion of the potential exposure pathways, routes of exposure, exposure media, and receptors to be considered in the HHRA, which will be used to refine the CSM discussed in the Work Plan. The exposure assessment will include the identification of receptor exposure variables such as exposure frequency, exposure duration, absorption factors, and intake rates. In accordance to guidance, the Reasonable Maximum Exposure (RME) exposure scenario will be applied and evaluated in the HHRA. Central Tendency (CT) exposure scenario calculations will be applied for exposure media where the RME scenario exceeds USEPA's acceptable risk levels. The CT calculations will be provided in an appendix to the HHRA and included in HHRA discussion with respect to uncertainty analysis.

Toxicity Assessment and Documentation

The toxicity assessment will identify the types of adverse health effects a COPC may potentially cause, and to define the relationships between the magnitude of exposure (dose/concentration) and the occurrence of specific health effects for a receptor (response). For the HHRA, CRA follows USEPA's process of estimating risk for both potential cancer and non-cancer effects. The dose/concentration-response factors for potential carcinogenic compounds are termed Cancer Slope Factors (CSFs) (oral exposure) or Unit Risk Factors (URFs) (inhalation exposure), and dose-response factors for potential non-carcinogenic compounds are termed Reference Doses (RfDs) (oral exposure) or Reference Concentrations (RfC) (inhalation exposure). The USEPA guidance provides a hierarchy for the selection of dose-response values in the risk assessment process. The USEPA Integrated Risk Information System (IRIS) is by far the best source of these values because of its high level of peer review. USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs) from the National Center for Environmental Assessment (NCEA) will be applied as a second tier source. These values are based upon revised values from HEAST tables. The California Environmental Protection Agency (Cal EPA), the Agency for Toxic Substances and Disease Registry (ATSDR), and HEAST tables will be consulted as third tier sources. As toxicological information becomes available on chemical compounds and elements the USEPA will update its IRIS database by withdrawing toxicity values and listing new ones. Occasionally toxicity values are withdrawn before a replacement value is approved through the extensive peer review process used by USEPA.

Risk Characterization

For the risk characterization, estimates of potential carcinogenic and non-carcinogenic risks will be quantified for each evaluated exposure pathway based on the exposure and toxicity assessments. Estimated cancer risks for identified exposure pathways will be

considered significant when greater than the identified acceptable risk level or range (1.0E-04 to 1.0E-06), while non-carcinogenic hazard estimates will be considered significant when greater than 1. Any naturally occurring parameter that is greater than its respective USEPA RSLs and/or applicable screening level criteria will be evaluated in the HHRA. As part of the risk characterization, potential risks from naturally occurring parameters such as arsenic may be estimated through a risk assessment using analytical data from background media samples. The background risk determination will be used to qualify the risk estimates for COPCs identified in Site media, where applicable. Background data will be used for comparisons to Site samples, and will also be used for risk assessment, and the differences between the two approaches is illustrated in the following example. In the case where arsenic concentrations are greater than soil screening levels, then arsenic would be identified as a COPC. A comparison of Site sample data to typical background levels may indicate the concentrations of arsenic in Site soils and fill material are within the typical background levels, yet the risk due to exposure to arsenic contaminated soil/fill will still be evaluated in the HHRA as it is a COPC with concentrations greater than screening levels. An evaluation of any naturally occurring parameters that contribute greater than 5 percent of the cumulative cancer risk will include a calculation of the risk level based on the background levels to determine what level of risk the background levels are contributing to the overall risk for the Site. Following risk characterization, an assessment of the uncertainty associated with the assumptions used throughout the HHRA process will be conducted to determine the level of confidence attributed to the characterization of risk.

Ecological Risk Assessment

The ERA will be completed in accordance with *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997) and the guidance listed in the SOW. This guidance, which is the standard by which ecological risk assessments are conducted under Superfund and other federal and state programs, is based on an 8-step process. Steps 1 and 2 are the screening or preliminary assessment and can end the process if justification can be provided. If the screening-level assessment identifies an unacceptable potential for ecological risk then a more detailed site-specific assessment following steps 3 through 8 should be conducted.

The screening-level assessment, (Steps 1 and 2 of the 8-step process) will identify constituents with concentrations above ecologically-based benchmarks (constituents of potential ecological concern [COPECs]), those media (i.e., surface water, sediments, soil) with elevated concentrations of COPECs, and those ecological receptors (e.g., fish and macro invertebrate community) most likely to have an unacceptable potential for risk. In accordance with USEPA (1997), the SERA will also identify complete and potentially

complete exposure pathways and ecological receptors (both lower and upper trophic receptors).

The first step in the ERA is problem formulation. In this step, CRA will review available documents to identify those chemical constituents that are known or expected to be present and define the environmental setting (i.e., types of cover types/habitats present and potentially complete exposure pathways). In addition, CRA will identify the fate and transport characteristics and mechanisms of ecotoxicity of the COPECs. Assessment endpoints for the problem formulation will also be identified. The problem formulation step will include an one-day site inspection by an experienced ecologist. In addition to facilitating characterization of the environmental setting, the site inspection will allow CRA to identify Site-specific receptors, critical habitats, and other environmentally sensitive areas on and adjacent to the site. Furthermore, the Site inspection will be useful in identifying complete and eliminating incomplete exposure pathways for evaluation in the screening-level ERA.

Following completion of the problem formulation, CRA will submit an interim deliverable (Ecological Effects Evaluation Proposal) that summarizes the problem formulation and presents methods and values to be used in the ecological effects evaluation (i.e., step 2 detailed below). The problem formulation will include a discussion of the following:

- Environmental setting
- Contaminants known or suspected to exist at the Site, as well as the maximum concentrations present for each medium
- Contaminant fate and transport mechanisms that might exist at the Site
- Mechansims of ecotoxicity associated with contaminants and likely categories of receptors that could be affected
- Complete exposure pathways that might exist at the Site from contaminant sources to receptors that could be affected
- Screening ecotoxicity values equivalent to chronic NOAELs (no observable adverse effects levels) based on conservative assumptions
- Basis for values, methods, and assumptions that will be used in the ERA evaluation

The second step in the screening-level ERA is the ecological effects evaluation. In this step, CRA will use the screening ecotoxicological values that were specified in the Ecological Effects Evaluation Proposal, and compare them to on-Site concentrations of the COPECs. For surface water, sediments, and soils, the maximum concentration of

each COC detected in each media will be compared to its screening ecotoxicological value. If characterization of the environmental setting and Site inspection indicate that higher trophic level receptors (e.g., fish, eating birds, and mammals) may be impacted by the COPECs, then CRA will utilize a simple food chain model to estimate intake of COPECs for representative upper-level receptors. As required by USEPA guidance, the SERA will initially use conservative assumptions and conservative screening ecotoxicological values. For example, relative bioavailability of chemicals in soil and food will be assumed to be 100 percent, the wildlife will be assumed to consume most contaminated prey/forage, and to forage only at the contaminated site. For each receptor evaluated, the estimated intake of COPECs will be compared to appropriate screening toxicological reference values. As per EPA guidance, these reference values will be NOAELs (no observable adverse effects levels).

Upon completion of Step 2, CRA will submit a deliverable documenting the methods and results of the screening-level ERA to USEPA. CRA's memorandum will identify the COPECs, media with elevated concentrations of COPECs, and potentially affected ecological receptors. Based on the extremely conservative nature of the screening-level ERA, CRA believes there is a high probability that one or more of the COPECs will exceed their screening eco-toxicological values, indicating the need for further evaluation of ecological risk. CRA's memo will include a section that discusses the sources of uncertainty in the screening-level ERA and the likelihood that any identified risks are real, as opposed to an artifact of the conservative nature of the screening-level assessment. The memo will include recommendations and strategies on how to proceed with the ecological risk assessment, if the screening-level ERA suggests further evaluation is warranted. CRA will identify types of investigations that could be used in Steps 3 through 8 of the ERA to best characterize risk and to develop appropriate site-specific remedial goals.

8.0 REFERENCES

Bouwer, Herman, 1974. Groundwater Hydrology. McGraw-Hill Book Company.

Conestoga-Rovers & Associates, October 2008. Leachate Seep Investigation.

Conestoga-Rovers & Associates, December 2008. Test Pit/Test Trench Investigation.

Conestoga-Rovers & Associates, March 2009. Phase I Groundwater Investigation.

Conestoga-Rovers & Associates, May 2009. Bathymetry Survey and Geophysical Investigation.

Conestoga-Rovers & Associates, January 2010. Landfill Gas Investigation.

Conestoga-Rovers & Associates, June 2011. Streamlined Remedial Investigation and Feasibility Study for Operable Unit One (OU1).

Ecology and Environment, Inc., 1991. Screening Site Inspection Report for South Dayton Dump, Moraine, Ohio. Prepared for United States Environmental Protection Agency.

Miscellaneous Montgomery County Health District Correspondence.

Montgomery County Health District Site inspections, completed at various dates.

Montgomery County Tax Map (undated), marked with unknown author's comments/notes.

National Oil and Hazardous Substances Pollution Contingency Plan. United States Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 300.

Naval Facilities Engineering Command Guidance for Environmental Background (NAVFAC), 2004. Analysis. Volume III: Groundwater. User's Guide UG-2059-ENV. Port Hueneme, California

Norris, S., and Spieker, A., 1966. Ground-Water Resources of the Dayton, Ohio Area, U.S. Geological Survey Water-Supply Paper #1808, 167 pp.

Ohio Environmental Protection Agency, 1985. Preliminary Assessment for the South Dayton Dump and Landfill.

Ohio Environmental Protection Agency, 1996. Site Team Evaluation Prioritization Report, South Dayton Dump and Landfill.

Ohio Environmental Protection Agency, 2010. Sample Collection and Evaluation of Vapor Intrusion to Indoor Air

Ohio Administrative Code 3745, Ohio Environmental Protection Agency. Last accessed on May 11, 2010 at http://codes.ohio.gov/oac/3745.

PRC Environmental Management, Inc. (Jack Brunner), February 10, 1995. Focused Site Inspection Prioritization Site Evaluation Report: South Dayton Dump, 1976 Springboro Road, Moraine Ohio. Prepared for U.S. Environmental Protection Agency. OHD 980 611 388.

PSARA Technologies, Inc., 1996. Installation of Groundwater Monitoring Wells at the South Dayton Dump, Moraine, Ohio. Prepared for Ohio Environmental Protection Agency.

Terran Corporation, October 13, 2005. Substructure Flooding Potential of the Great Miami River Aquifer prepared for the Miami Conservancy District. Project No. MCD05A.

The Payne Firm, Inc., April 2001. DRAFT Summary Report: South Dayton Landfill. Project No. 279.44.05.

The Payne Firm, Inc., July 26, 2002. Environmental Data Summaries prepared for Coolidge, Wall, Womsley & Lombard. Project No. 279.44.05.

The Payne Firm, Inc., November 6, 2002. South Dayton Landfill Notes (DRAFT). Project No. 279.44.05.

The Payne Firm, Inc., (not dated). Photographic Review: Grillot Landfill (DRAFT), prepared Coolidge, Wall, Womsley & Lombard, for Project No. 279.44.05.

The Payne Firm, Inc., (not dated). South Dayton Landfill: Remedial Action Issues (DRAFT). Project No. 279.44.05.

The Payne Firm, Inc., (not dated). South Dayton Landfill: Site History (DRAFT). Project No. 279.44.05.

United States Environmental Protection Agency, Office of Emergency and Remedial Response, October 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. OSWER Directive No. 9355.3-01, EPA/540/G-89/004.

United States Environmental Protection Agency, Office of Emergency and Remedial Response, February 1991a. Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites. EPA/540/P-91/001.

United States Environmental Protection Agency, September 1993. Presumptive Remedy for CERCLA Municipal Landfill Sites. OSWER Directive No. 9355.0-49FS.

USEPA, June 1994. Statistical Methods for Evaluating the Attainment of Cleanup Standards. Volume 3: Reference-Based Standards for Soil and Solid Media. Environmental Statistics and Information Division (2163), Office of Policy, Planning, and Evaluation. EPA 230-R-94-004.

United States Environmental Protection Agency, 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments

United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, April 21, 1999, Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Site. Directive Number 9200.4-17P.

United States Environmental Protection Agency, July 2000. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study (EPA 540-R-00-002).

United States Environmental Protection Agency, June 2002. Aerial Photographic Analysis of South Dayton Dump Site (TS-PIC-20205585S).

United State Environmental Protection Agency, Office of Emergency and Remedial Response, September 2002. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (OSWER 9285.7-41). (EPA/540/R-01/003)

United States Environmental Protection Agency, November 2002, OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (EPA-530-D-02-004)

United State Environmental Protection Agency, Office of Environmental Information, February 2006. Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S). (EPA/240/B-06/003) [Available at http://www.epa.gov/quality/qs-docs/g9s-final.pdf]. [Section 3.3 in particular].

United States Environmental Protection Agency, January 2008. Streamlined Risk Assessment of South Dayton Dump and Landfill Site Attachment (Attachment 2 of USEPA comments on RI/FS Work Plan).

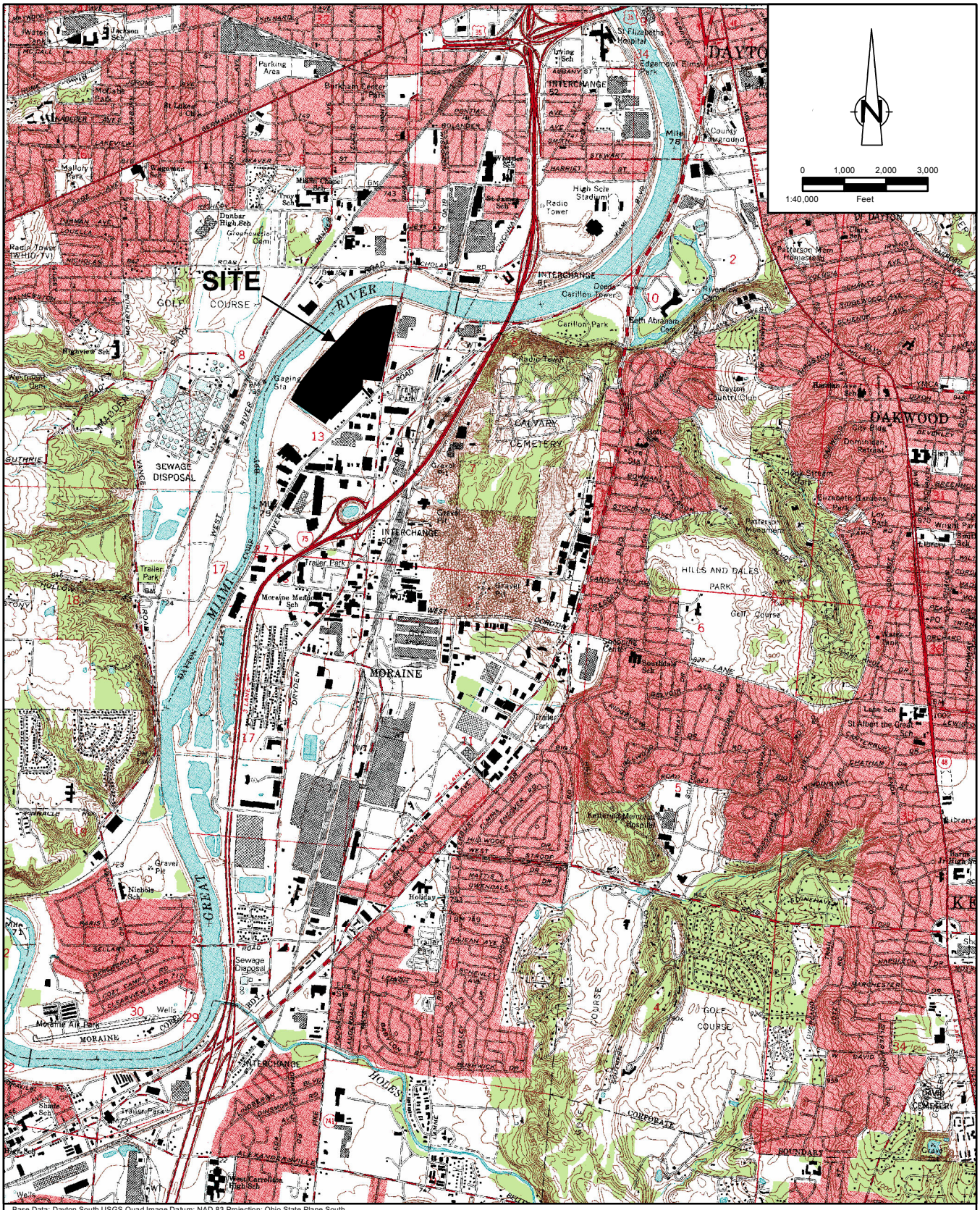
United States Environmental Protection Agency, Office of Resource Conservation and Recovery, Program Implementation and Information Division, March 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. (EPA 530-R-09-007) [Chapter 5 and elsewhere].

United States Environmental Protection Agency, August 2009. Superfund Green Remediation Strategy.

United States Environmental Protection Agency, August 2009b. Principles for Greener Cleanups.

United States Environmental Protection Agency, Office of Research and Development, September 2013. ProUCL Version 5.0.00 Technical Guide. (EPA/600/R-07/041) [Chapters 3 and 5].

United States Geological Survey, 2002. Statistical Methods in Water Resources. By D.R. Helsel and R.M. Hirsch. Chapter A3 of Book 4, Hydrologic Analysis and Interpretation in Techniques of Water-Resources Investigations of the United States Geological Survey. [Available at http://pubs.usgs.gov/twri/twri4a3/]. [Chapter 3].



Base Data: Dayton South USGS Quad Image Datum: NAD 83 Projection: Ohio State Plane South

figure 1.1

SITE LOCATION MAP
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443(REP019)GIS-WA001 Monday, April 08, 2013

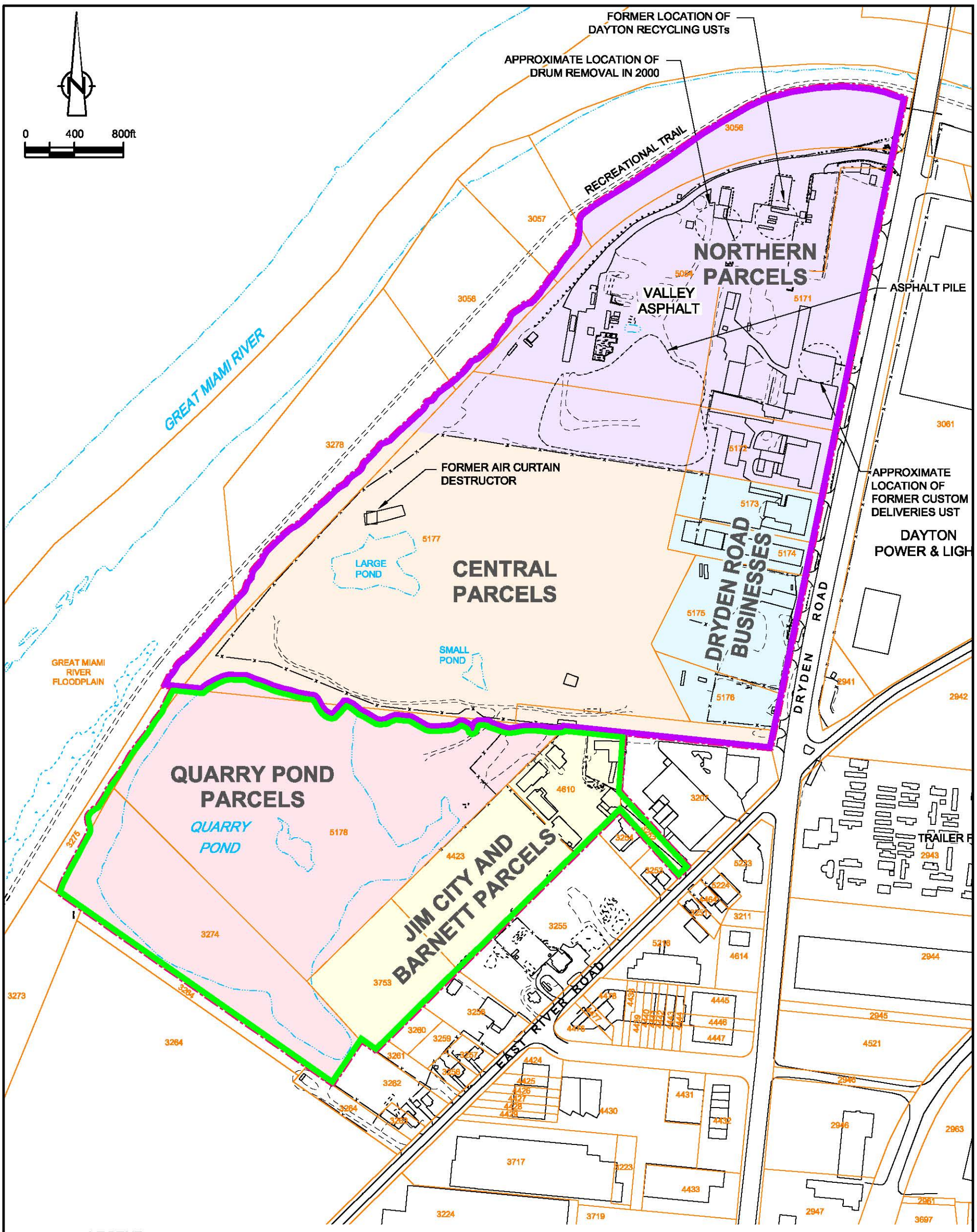
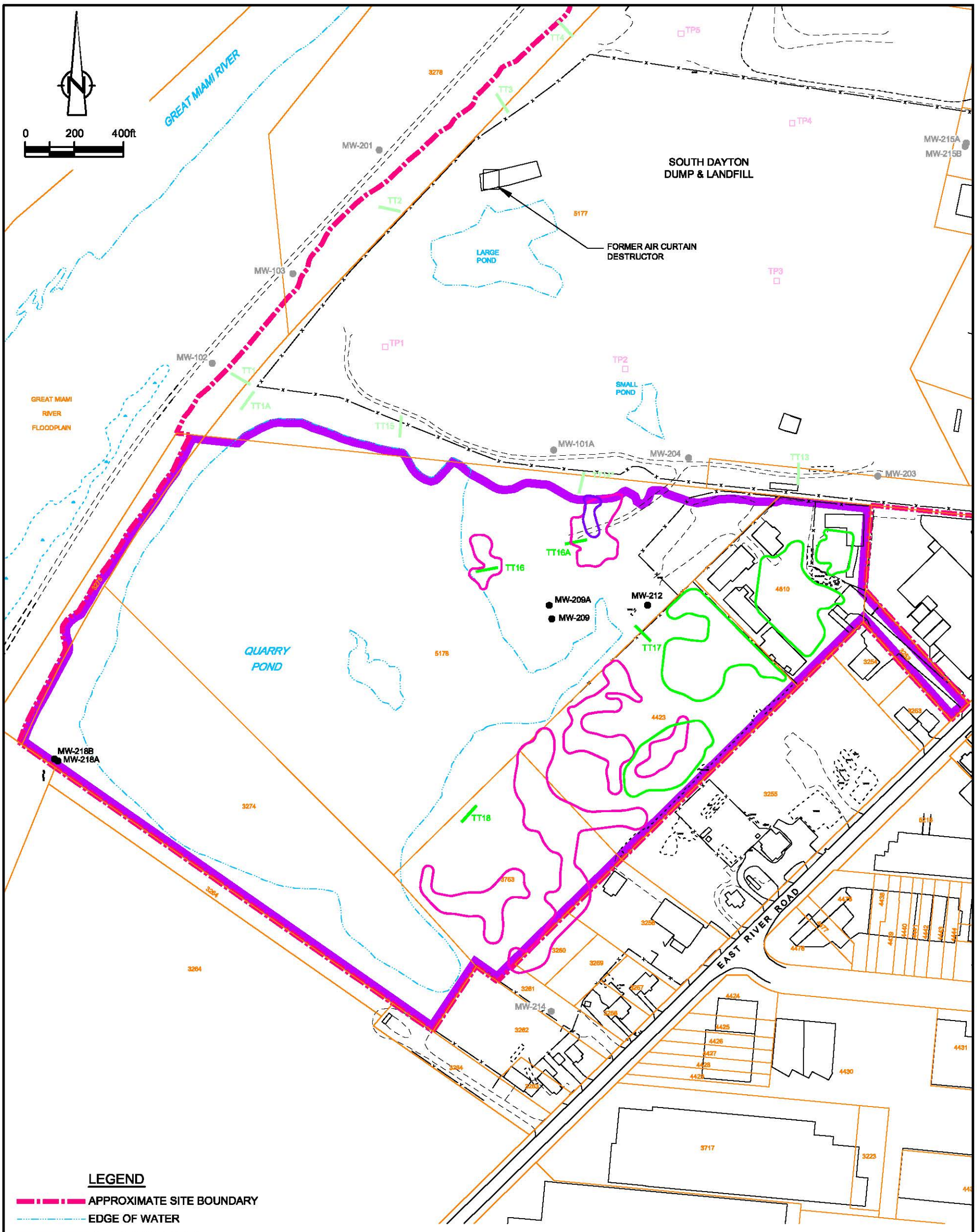


figure 1.2

SITE LIMITS AND LAYOUT
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 8/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2006

38443-14(019)GN-WA001 JAN 22/2014

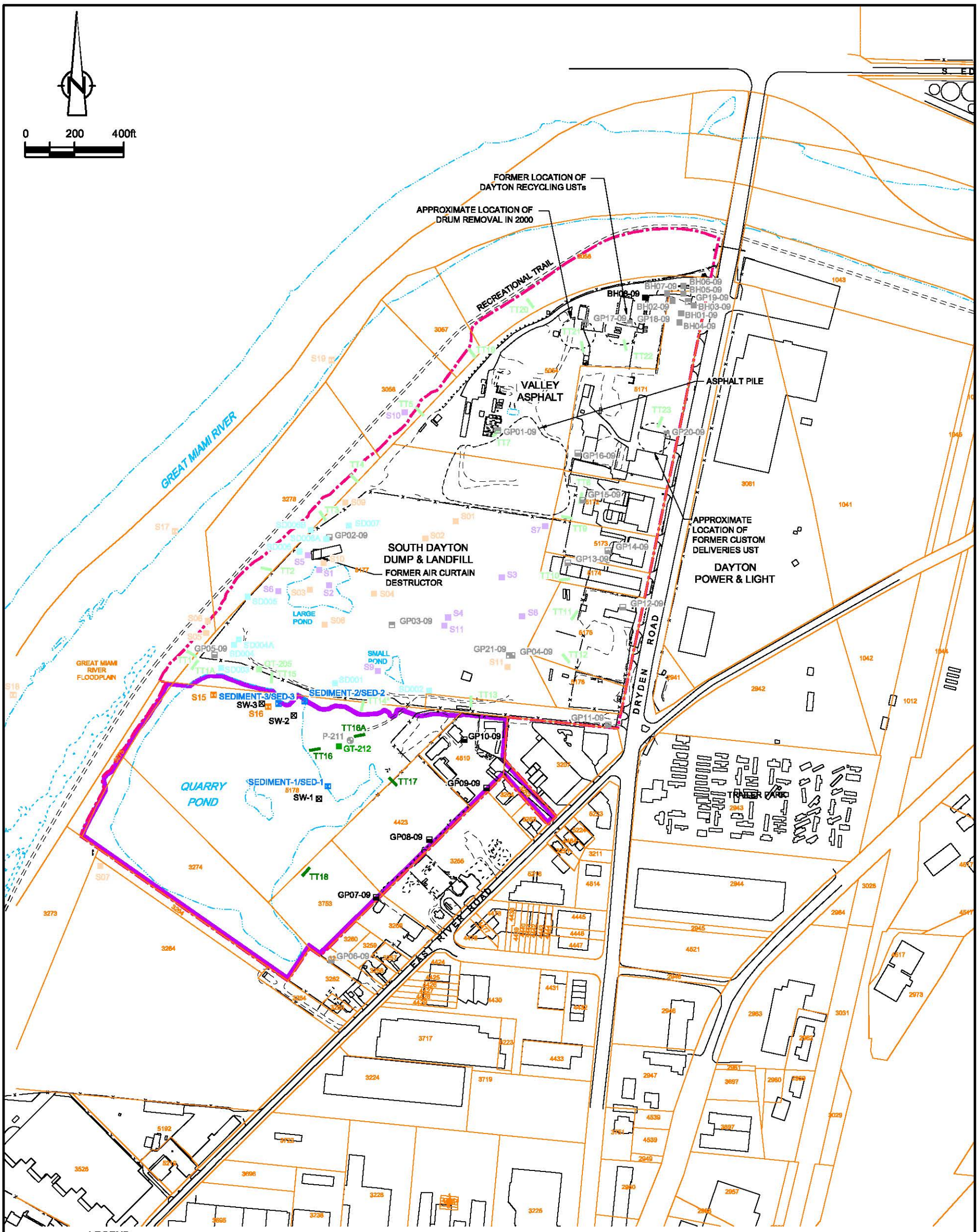


SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 8/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2006

figure 2.1

OU2 GEOPHYSICAL ANOMALIES
AND TEST TRENCH INVESTIGATIVE LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA002 JAN 22/2014



LEGEND

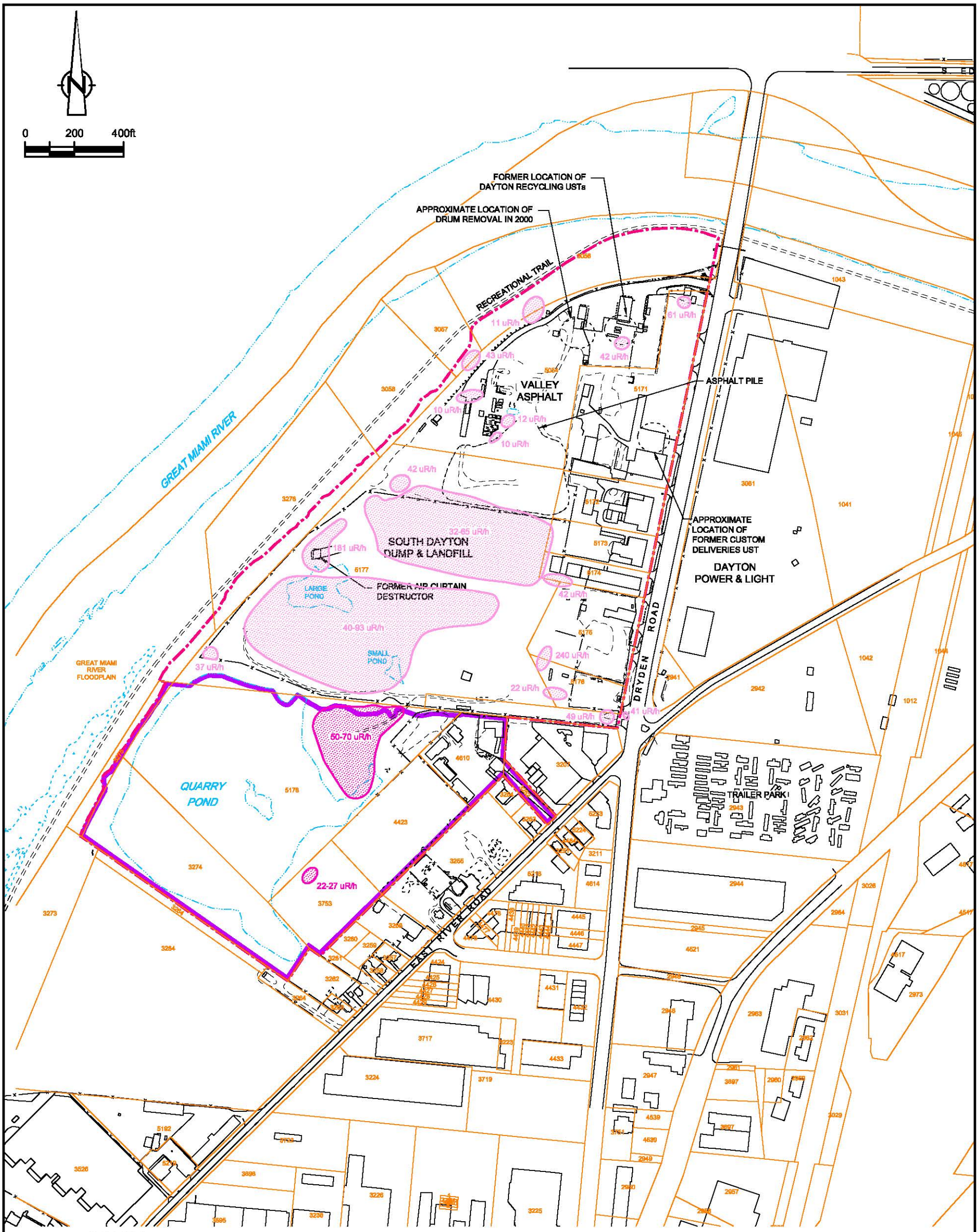
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- P-211 PIEZOMETER LOCATION
- SEDIMENT-1 /SED-1 PFI 1999 & 2000 SEDIMENT SAMPLING LOCATION (APPROXIMATE)
- S15 OHIO EPA SEDIMENT SAMPLE LOCATION (APPROXIMATE)
- SW-1 PFI 1999 & 2000 SURFACE WATER SAMPLE LOCATION (APPROXIMATE)
- BH01-09 SOIL BORING LOCATION
- SD003 PSARA SOIL BORING LOCATION (APPROXIMATE)
- S01 OHIO EPA SOIL BORING LOCATION (APPROXIMATE)
- S1 EPA SOIL BORING LOCATION (APPROXIMATE)
- GT-205 PFI GEOTECHNICAL SOIL BORING LOCATION (APPROXIMATE)
- GP01-09 SHALLOW LANDFILL GAS PROBE
- GP02-09 DEEP LANDFILL GAS PROBE

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 8/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 2.2

SOIL, SEDIMENT, SOIL GAS, AND SURFACE WATER SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA003 JAN 22/2014



LEGEND

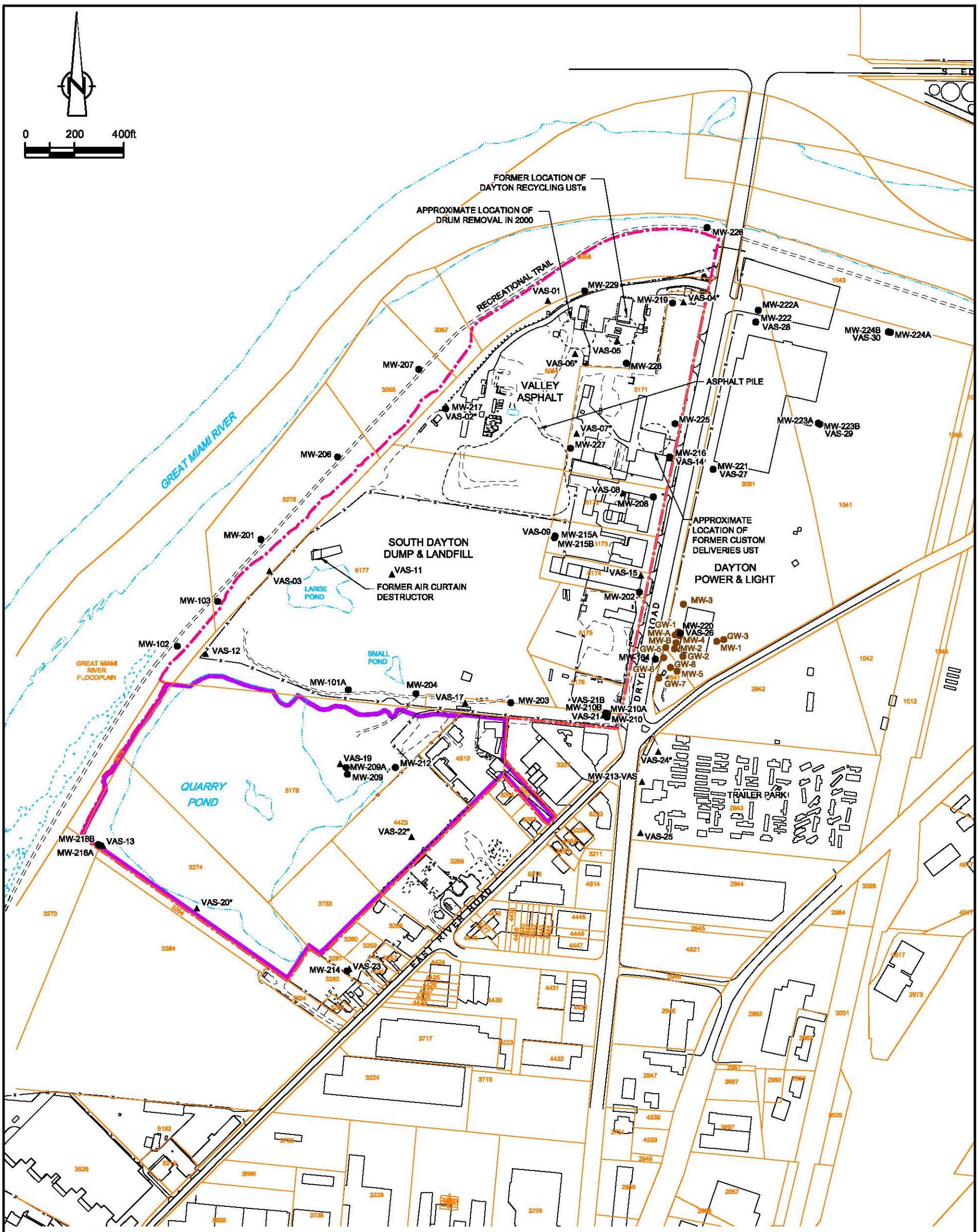
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- AREA SCREENED FOR RADIATION LEVELS

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 2.3

RADIATION SCREENING RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA009 JAN 22/2014



LEGEND

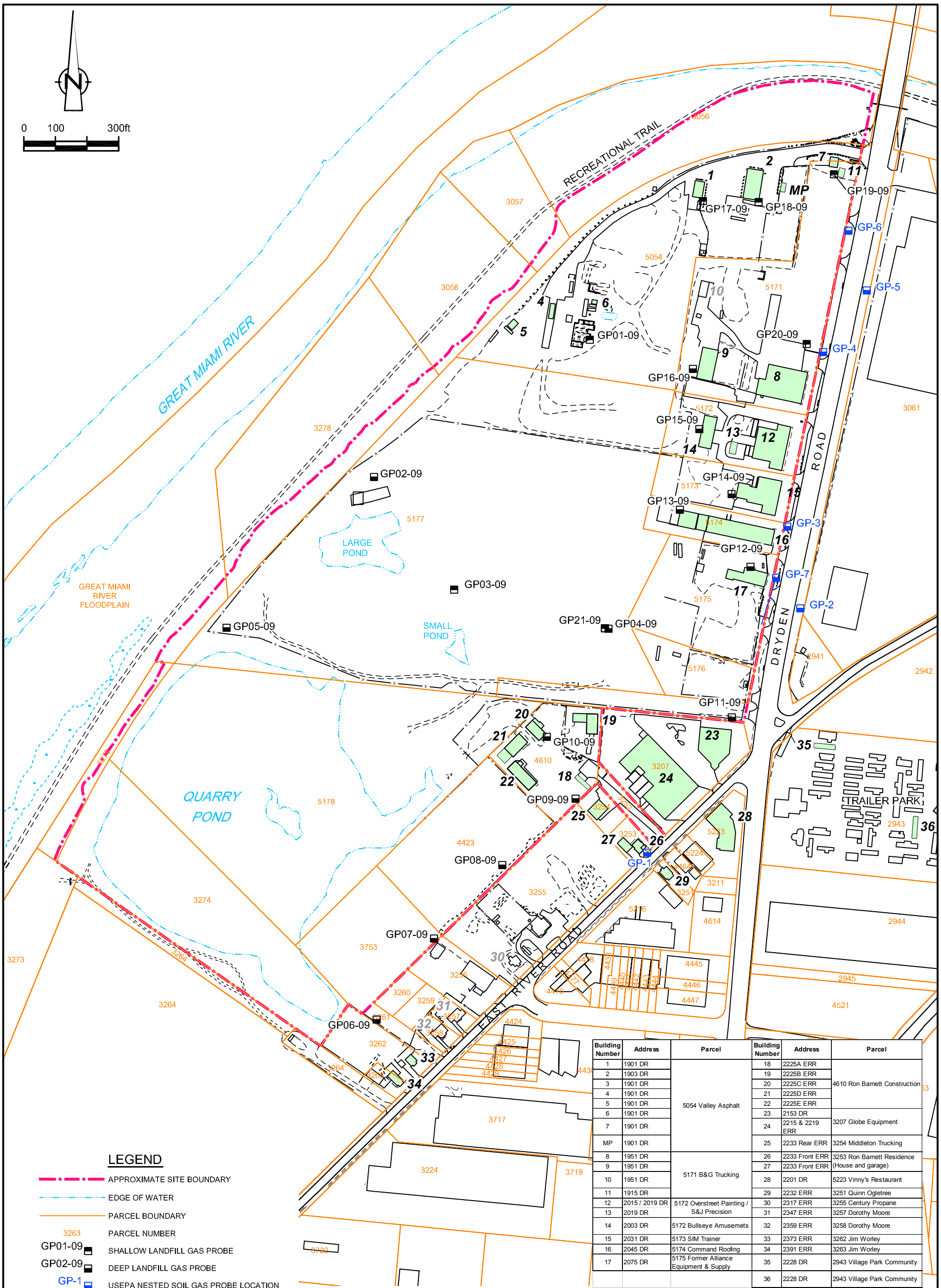
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- MW-206 ● UPPER AQUIFER MONITORING WELL LOCATION
- MW-1 ● HISTORIC DP&L MONITORING WELL LOCATION
- VAS-01 ▲ VERTICAL AQUIFER SAMPLING LOCATION
- • VAS LOCATION COMPLETED TO 70 FEET BELOW GROUND SURFACE OR LESS

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 2.4

GROUNDWATER SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA010 JAN 22/2014



Building Number	Address	Parcel	Building Number	Address	Parcel
1	1901 DR	5054 Valley Asphalt	18	2225A ERR	4610 Ron Barnett Construction
2	1903 DR		19	2225B ERR	
3	1901 DR		20	2225C ERR	
4	1901 DR		21	2225D ERR	
5	1901 DR		22	2225E ERR	
6	1901 DR		23	2153 DR	3207 Globe Equipment
7	1901 DR		24	2215 & 2219 ERR	
MP	1901 DR		25	2233 Rear ERR	3254 Middleton Trucking
8	1951 DR	5171 B&G Trucking	26	2233 Front ERR	3253 Ron Barnett Residence (House and garage)
9	1951 DR		27	2233 Front ERR	
10	1951 DR		28	2201 DR	5223 Vinny's Restaurant
11	1915 DR		29	2232 ERR	3251 Quinn Ogletree
12	2015 / 2019 DR	5172 Overstreet Painting / S&J Precision	30	2317 ERR	3255 Century Propane
13	2019 DR		31	2347 ERR	3257 Dorothy Moore
14	2003 DR	5172 Bullseye Amusemets	32	2359 ERR	3258 Dorothy Moore
15	2031 DR	5173 SIM Trainer	33	2373 ERR	3262 Jim Worley
16	2045 DR	5174 Command Roofing	34	2391 ERR	3263 Jim Worley
17	2075 DR	5175 Former Alliance Equipment & Supply	35	2228 DR	2943 Village Park Community
			36	2228 DR	2943 Village Park Community

LEGEND

- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3263 PARCEL NUMBER
- GP01-09 SHALLOW LANDFILL GAS PROBE
- GP02-09 DEEP LANDFILL GAS PROBE
- GP-1 USEPA NESTED SOIL GAS PROBE LOCATION
- 1 USEPA REMOVAL PROGRAM BUILDING NUMBER
- VI INVESTIGATED BUILDINGS

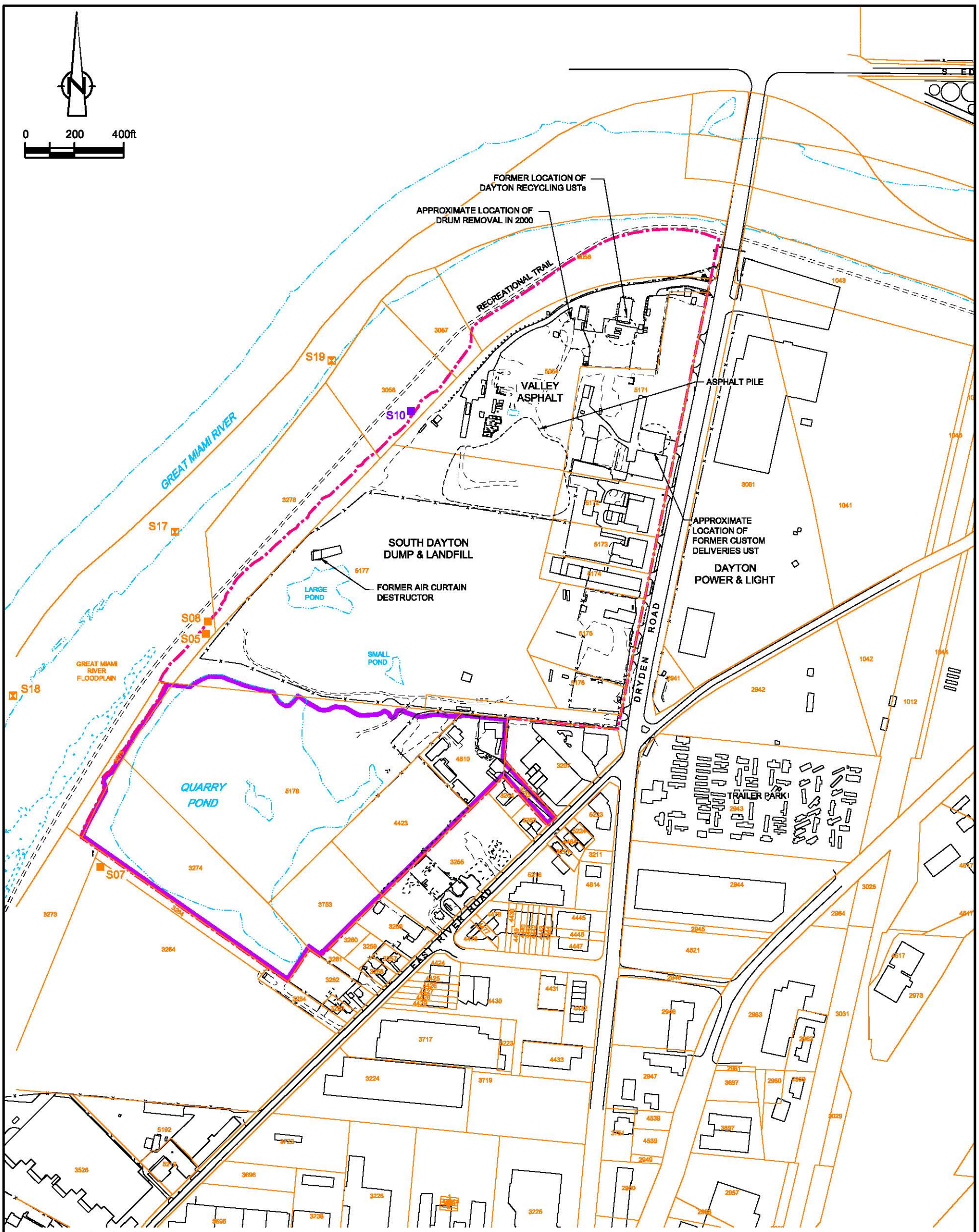
figure 2.5

VAPOR INTRUSION INVESTIGATION BUILDING NUMBERS SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-14(019)GN-WA012 JAN 27/2014



LEGEND

- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- S15 OHIO EPA SEDIMENT SAMPLE LOCATION (APPROXIMATE)
- S01 OHIO EPA SOIL BORING LOCATION (APPROXIMATE)
- S1 EPA SOIL BORING LOCATION (APPROXIMATE)

figure 2.6

GREAT MIAMI RIVER SOIL AND SEDIMENT SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2006

38443-14(019)GN-WA004 JAN 27/2014

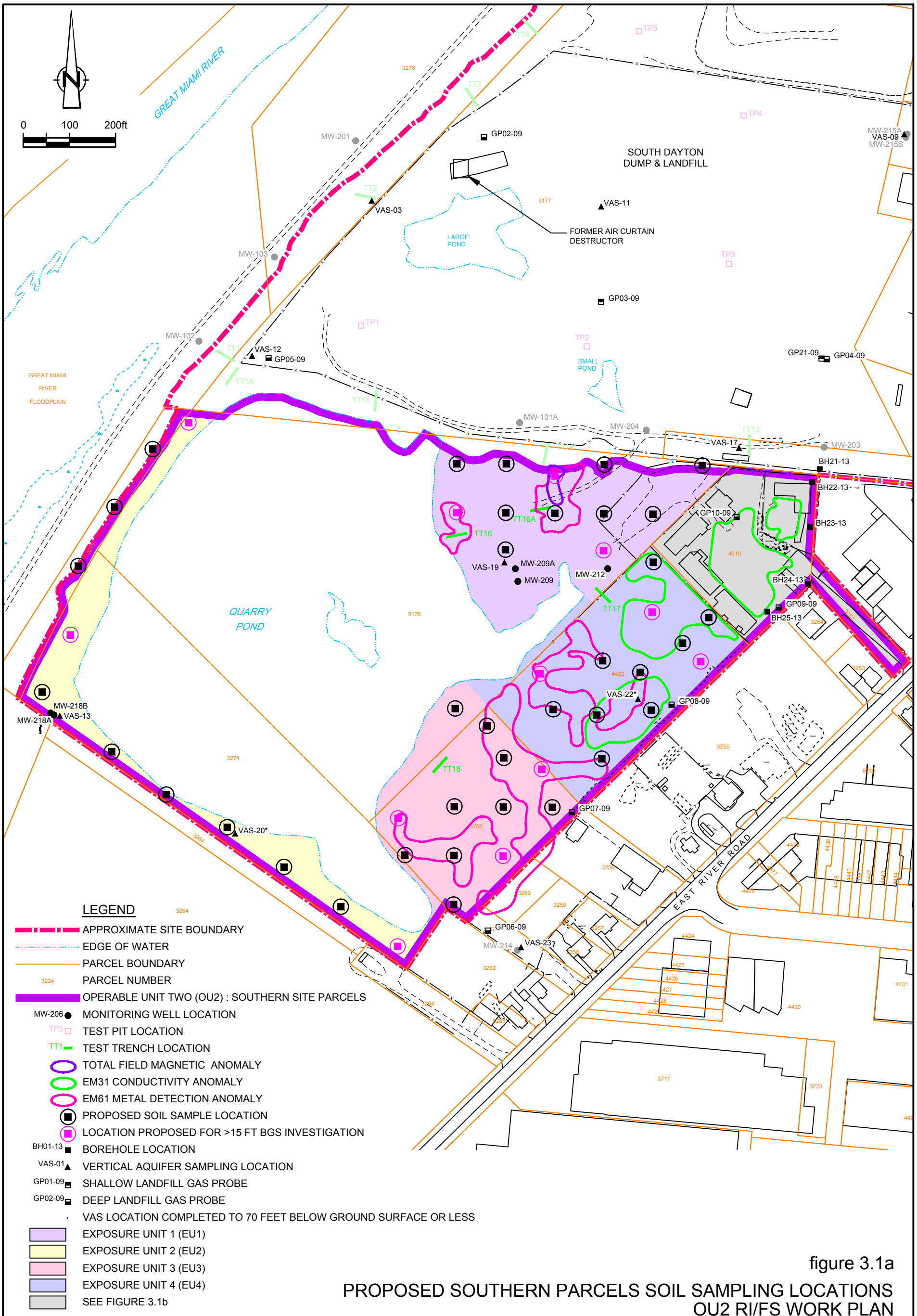
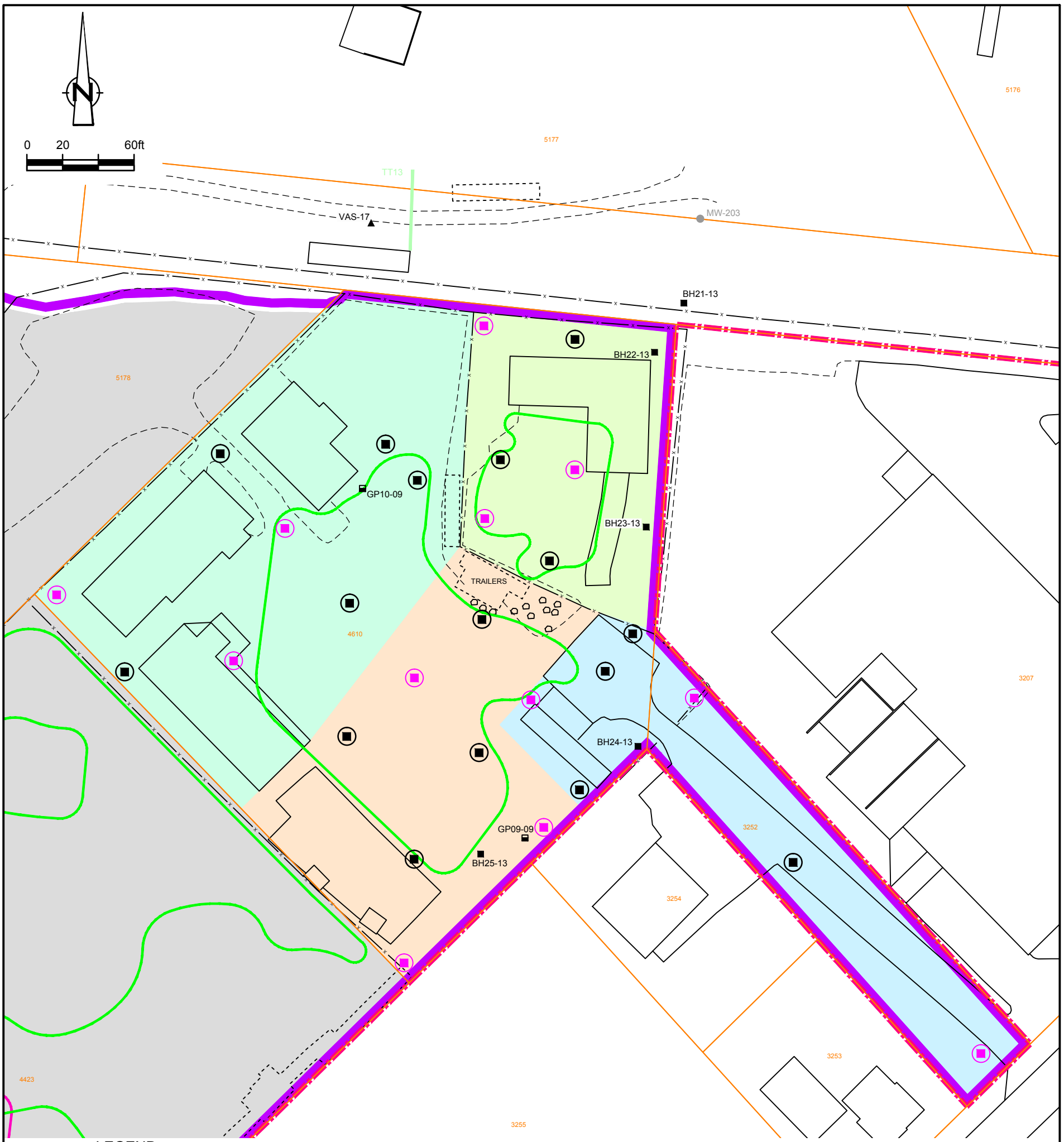


figure 3.1a

PROPOSED SOUTHERN PARCELS SOIL SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-14(019)GN-WA014 APR 25/2014



LEGEND

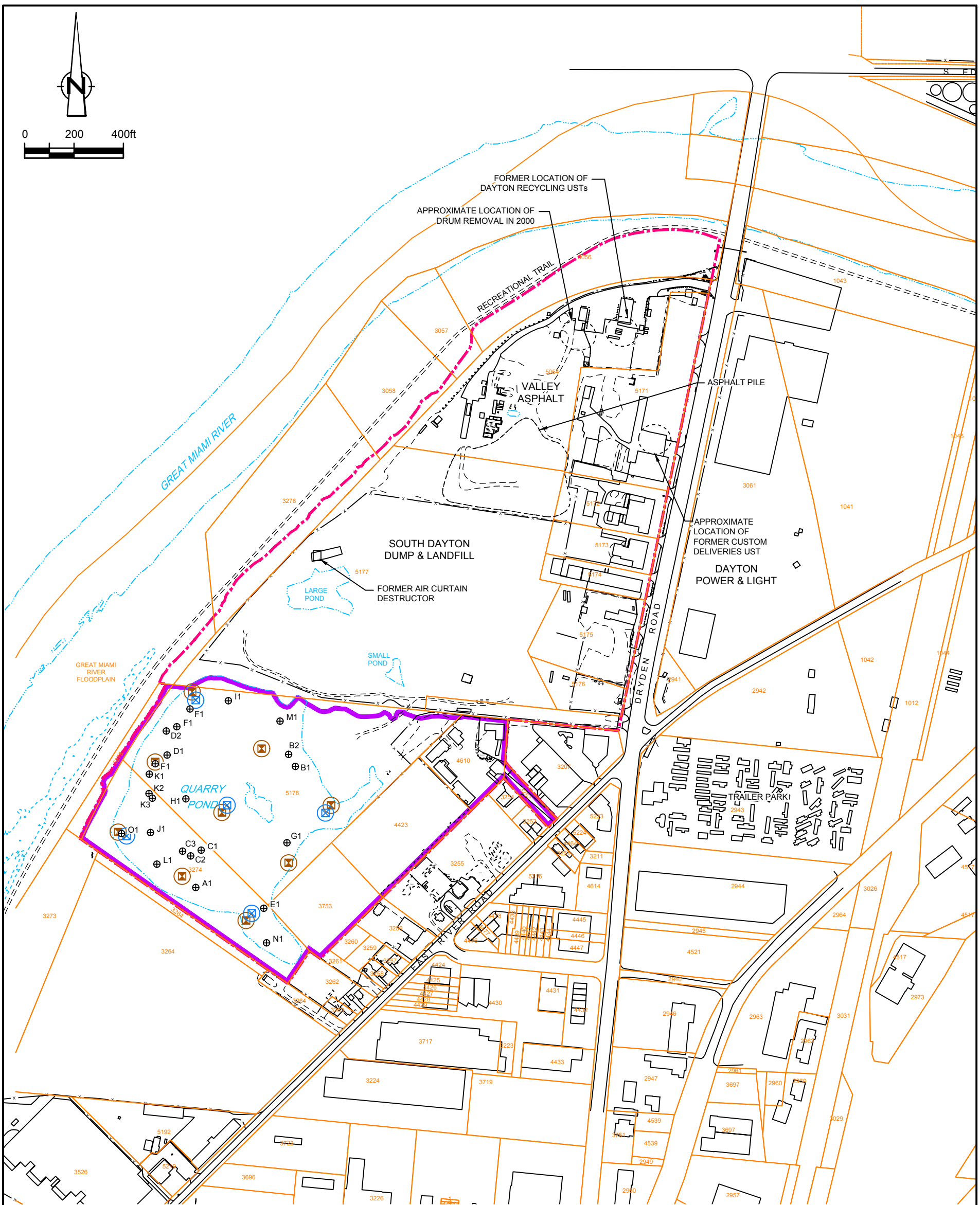
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- MW-206 MONITORING WELL LOCATION
- TOTAL FIELD MAGNETIC ANOMALY
- EM31 CONDUCTIVITY ANOMALY
- EM61 METAL DETECTION ANOMALY
- PROPOSED SOIL SAMPLE LOCATION
- LOCATION PROPOSED FOR >15 FT BGS INVESTIGATION
- BH01-13 BOREHOLE LOCATION
- VAS-01 VERTICAL AQUIFER SAMPLING LOCATION
- GP02-09 DEEP LANDFILL GAS PROBE
- EXPOSURE UNIT 5 (EU5)
- EXPOSURE UNIT 6 (EU6)
- EXPOSURE UNIT 7 (EU7)
- EXPOSURE UNIT 8 (EU8)
- SEE FIGURE 3.1a

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 3.1b

PROPOSED SOUTHERN PARCELS SOIL SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA017 APR 30/2014



LEGEND

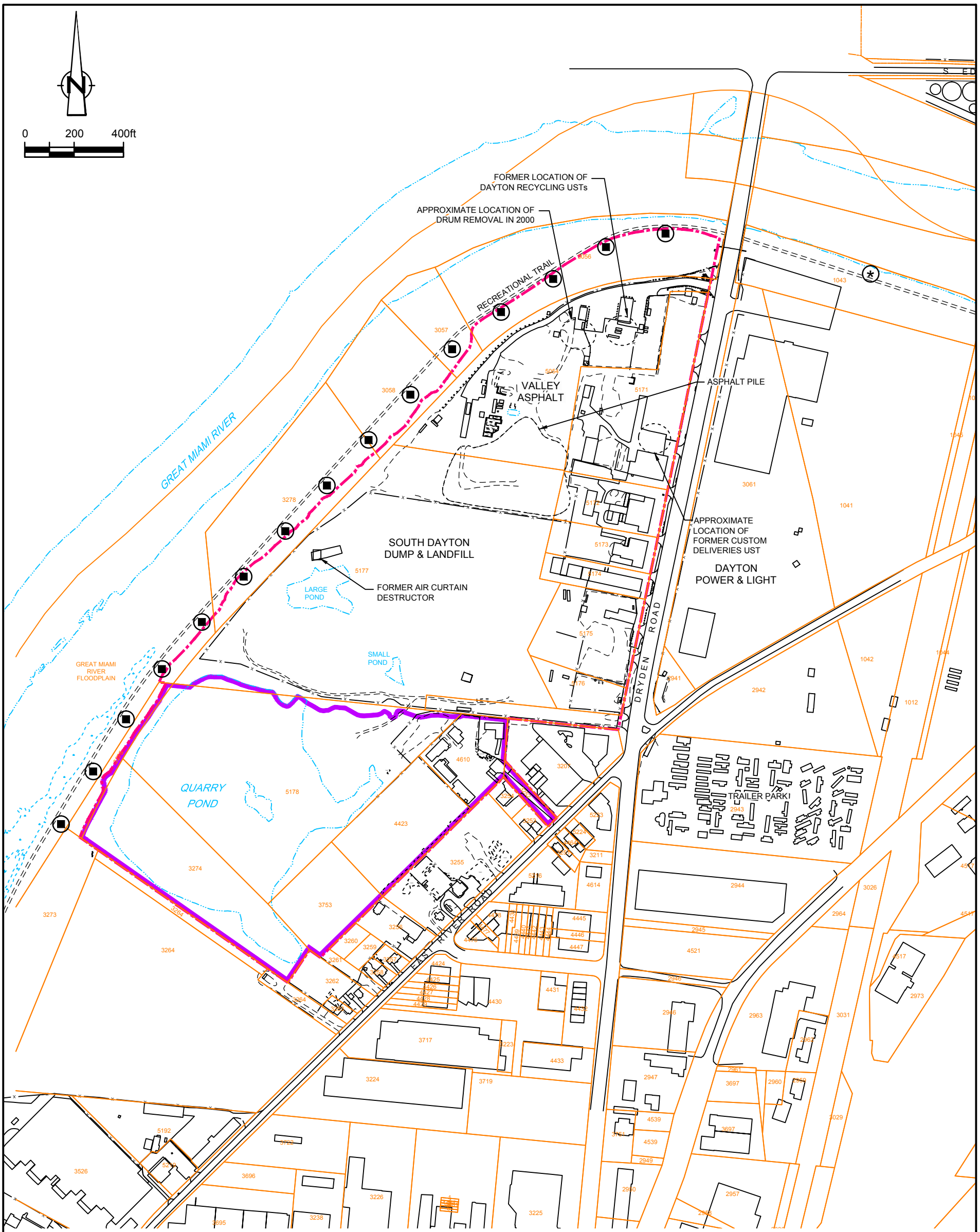
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- A1 OHIO EPA SONAR SURVEY OBJECT LOCATION
- PROPOSED SEDIMENT SAMPLING LOCATION
- PROPOSED SURFACE WATER SAMPLE LOCATION

figure 3.2

PROPOSED QUARRY POND SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-14(019)GN-WA007 APR 29/2014



LEGEND

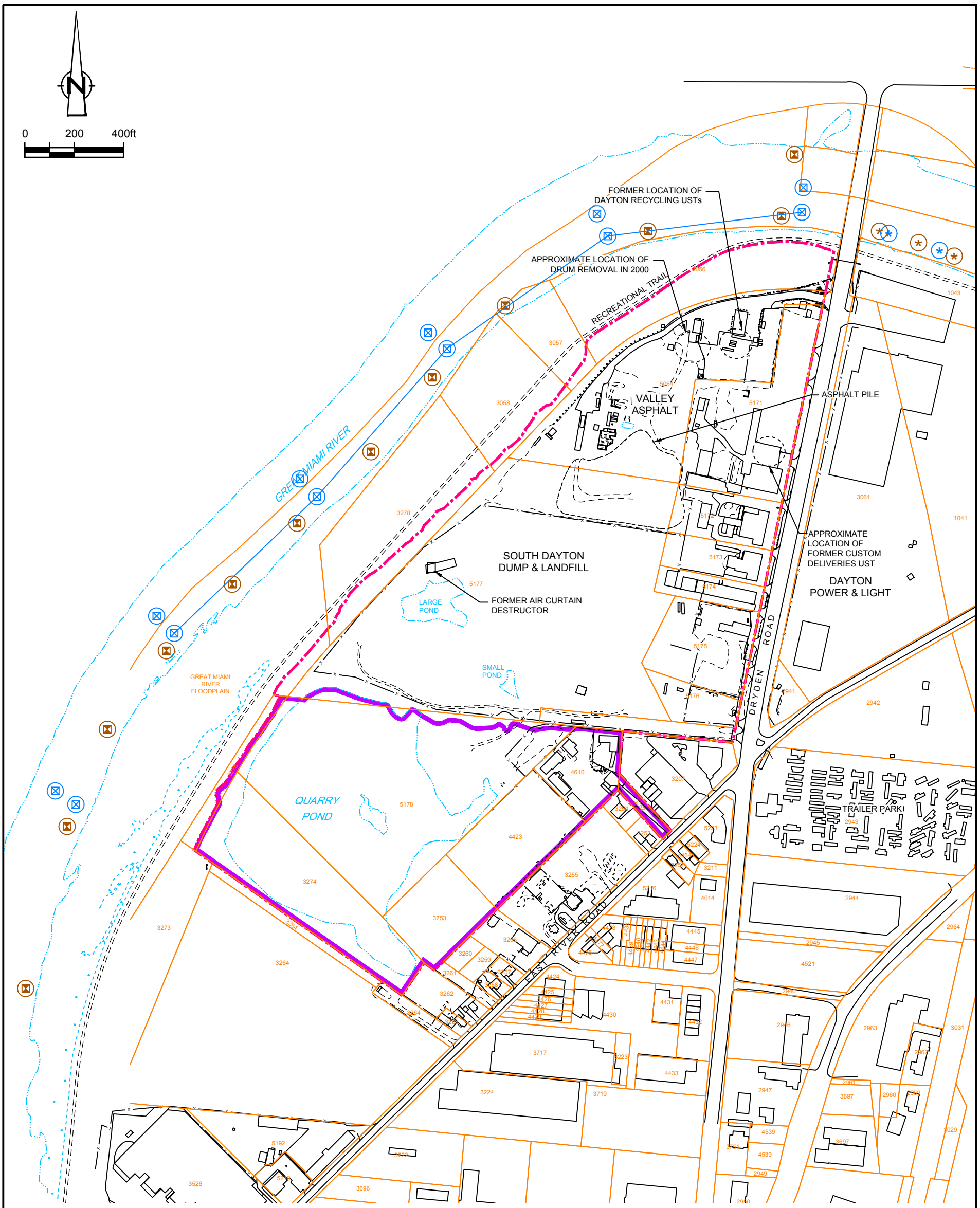
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- PROPOSED SOIL SAMPLING LOCATION (HAND-DUG DUE TO PRESENCE OF HIGH PRESSURE GAS LINE)
- PROPOSED UPGRADIENT BACKGROUND SOIL SAMPLE LOCATIONS (10 DISCRETE SAMPLES WILL BE COLLECTED)

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 3.3

PROPOSED FLOODPLAIN SOIL SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA006 APR 22/2014



LEGEND

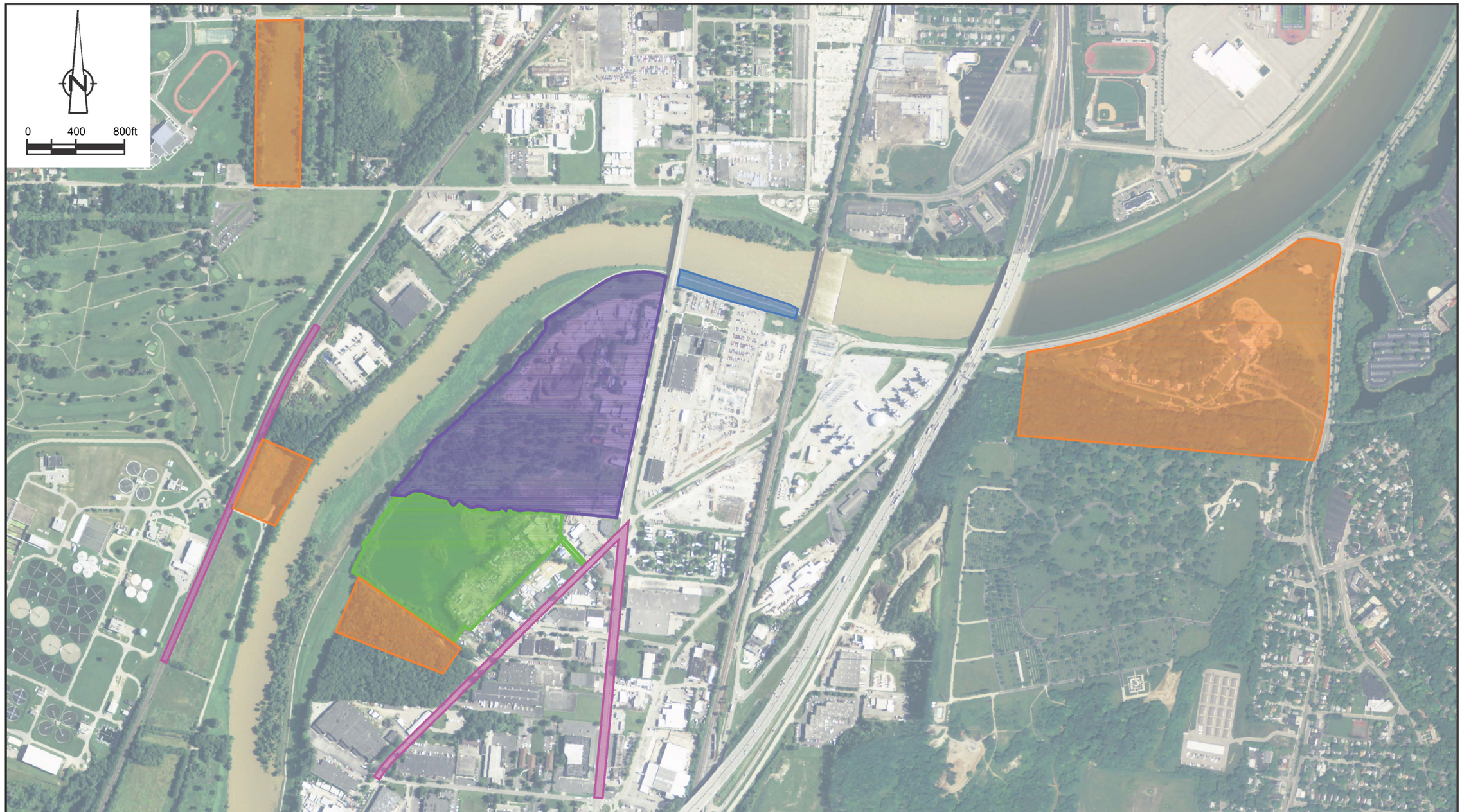
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT ONE (OU2)
- PROPOSED SEDIMENT SAMPLING LOCATION
- PROPOSED SURFACE WATER SAMPLE LOCATION
- PROPOSED UPGRADIENT BACKGROUND SAMPLE LOCATIONS WILL CONSIST OF TRANSECTS OF TWO (SW) / THREE (SEDIMENT) SAMPLES REGULARLY SPACED UPSTREAM OF THE SITE AND DOWNSTREAM OF THE DAM OVER 2 SAMPLING ROUNDS

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 3.4

PROPOSED GREAT MIAMI RIVER SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA008 APR 22/2014



LEGEND

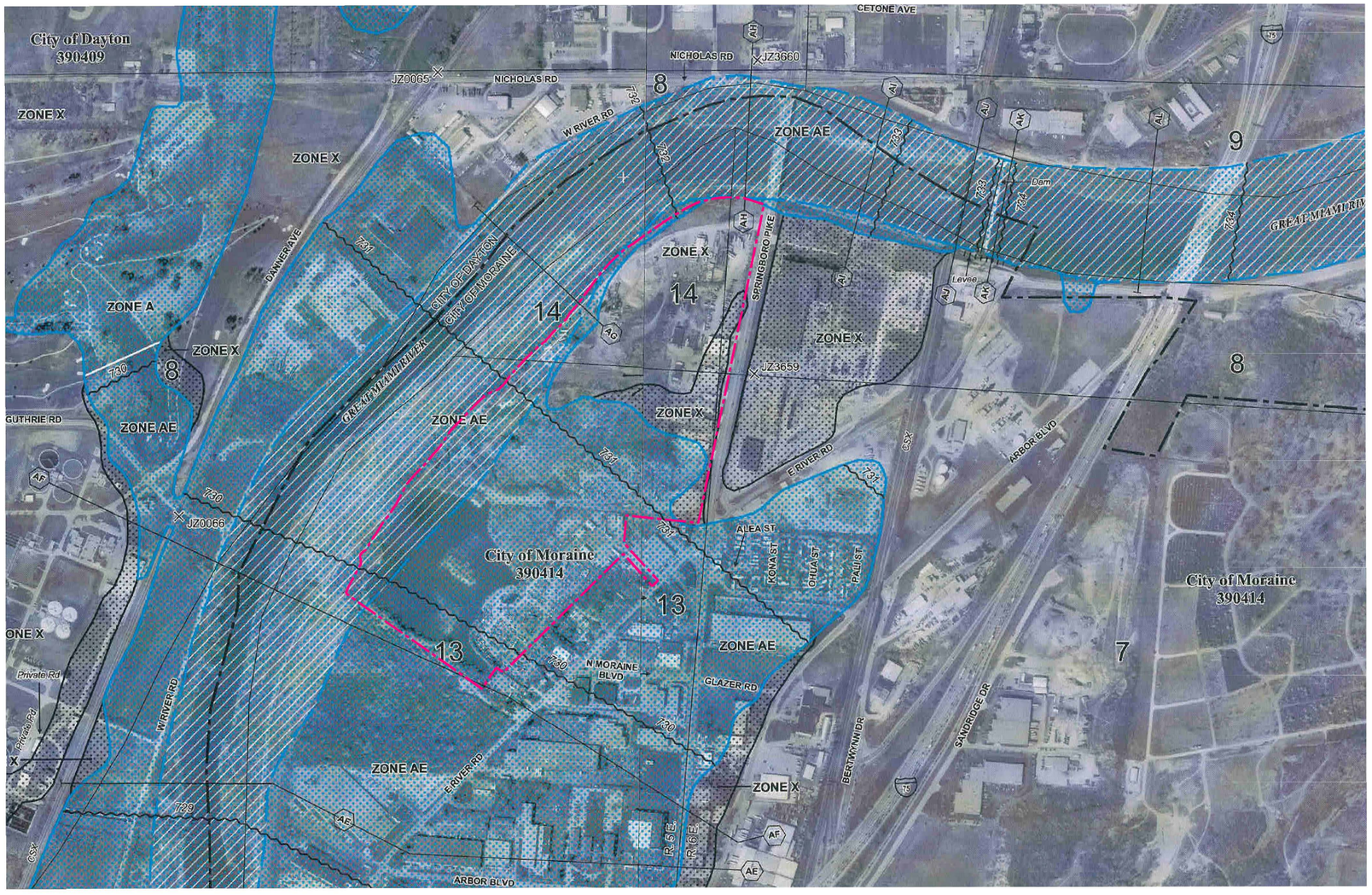
- PROPOSED ROADSIDE BACKGROUND SOIL SAMPLING AREA
- OPERABLE UNIT ONE (OU1) : PRESUMPTIVE REMEDY AREA
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- PROPOSED BACKGROUND SOIL SAMPLING AREA
- PROPOSED UPGRADIENT FLOODPLAIN SOIL SAMPLING AREA

AERIAL IMAGE SOURCE:
NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) MONTGOMERY COUNTY, OH, 2010, MOSAIC PROVIDED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE (USDA), 2013.

figure 3.5

PROPOSED BACKGROUND SOIL SAMPLING LOCATIONS
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA013 JAN 27/2014



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

A — A	Cross section line
23 - - - - 23	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4989000 FT	5000-foot grid ticks: Ohio State Plane coordinate system, South zone (FIPS Zone 3402), Transverse Mercator
4989000m N	1000-meter Universal Transverse Mercator grid values, zone 17
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile
	APPROXIMATE SITE BOUNDARY

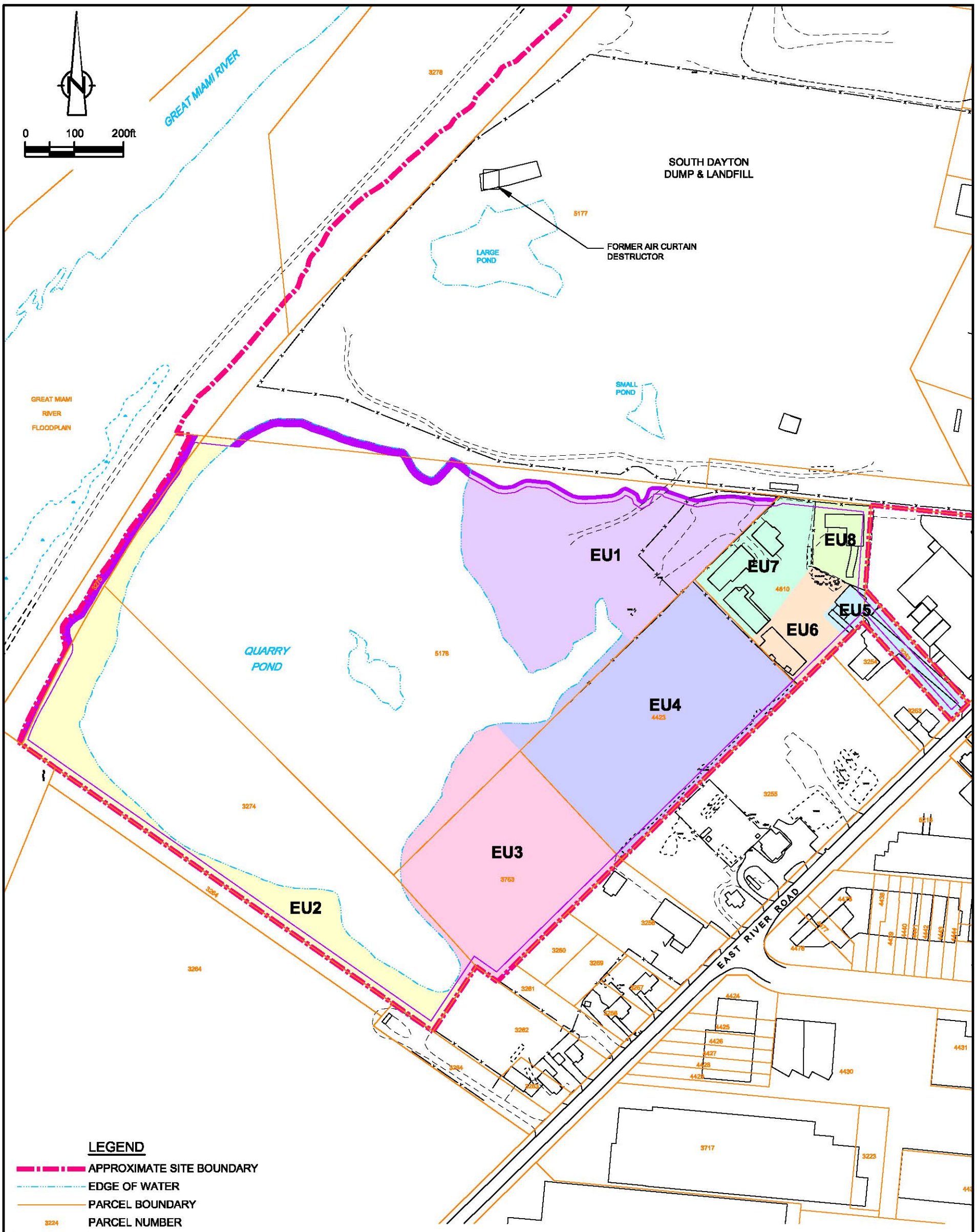
0 400 800ft

figure 5.1

FLOODWAY AND FLOOD PLAIN MAP
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCE: FEMA FLOOD INSURANCE RATE MAP, PANELS 251, 252, AND 253, JANUARY 6, 2005.

38443-14(019)GN-WA015 APR 24/2014



LEGEND

- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3224 PARCEL NUMBER
- OPERABLE UNIT TWO (OU2) : SOUTHERN SITE PARCELS
- EXPOSURE UNIT 1 (EU1)
- EXPOSURE UNIT 2 (EU2)
- EXPOSURE UNIT 3 (EU3)
- EXPOSURE UNIT 4 (EU4)
- EXPOSURE UNIT 5 (EU5)
- EXPOSURE UNIT 6 (EU6)
- EXPOSURE UNIT 7 (EU7)
- EXPOSURE UNIT 8 (EU8)

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 8/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 5.2

EXPOSURE UNITS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA016 APR 25/2014

TABLE 2.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S10(EPA)*	*S07(OEPA)*	*S08(OEPA)*	*TT-16*	*TT-17*	*TT-17*	*TT-18*	*TT-18*
Sample ID:			*S10*	*96-DV-03-S07*	*96-DV-03-S08*	*S-38443-093008-KMV-033*	*S-38443-093008-KMV-034*	*S-38443-093008-KMV-035*	*S-38443-100108-KMV-036*	*S-38443-100108-KMV-037*
Sample Date:	*USEPA Regional Screening Levels [1]*		*10/23/1990*	*7/9/1996*	*7/9/1996*	*9/30/2008*	*9/30/2008*	*9/30/2008*	*10/1/2008*	*10/1/2008*
Sample Depth:			*0-1 ft BWS*	*0-0.2 ft BWS*	*0.2-0.3 ft BWS*	*2 ft BWS*	*5 ft BWS*	*14 ft BWS*	*5 ft BWS*	*12 ft BWS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*								
Volatiles										
1,1,1-Trichloroethane	8700	38000	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,1,2,2-Tetrachloroethane	0.56	2.8	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,1,2-Trichloroethane	1.1	5.3	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,1-Dichloroethane	3.3	17	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,1-Dichloroethene	240	1100	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,2,4-Trichlorobenzene	22	99	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0054	0.069	-	-	-	0.0094 U	0.01 U	0.012 U	R	0.0098 U
1,2-Dibromoethane (Ethylene dibromide)	0.034	0.17	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,2-Dichlorobenzene	1900	9800	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,2-Dichloroethane	0.43	2.2	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,2-Dichloroethene (total)	700	9200	0.005 U	0.011 U	0.011 U	-	-	-	-	-
1,2-Dichloropropane	0.94	4.7	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,3-Dichlorobenzene	-	-	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
1,4-Dichlorobenzene	2.4	12	-	-	-	0.0047 U	0.005 U	0.0061 U	0.023 J	0.0049 U
2-Butanone (Methyl ethyl ketone) (MEK)	28000	200000	0.01 U	0.011 U	0.011 U	0.0047 J	0.02 U	0.024 U	R	0.02 U
2-Hexanone	210	1400	-	0.011 U	0.011 U	0.019 U	0.02 U	0.024 U	R	0.02 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	5300	53000	0.01 U	0.011 U	0.011 U	0.019 U	0.02 U	0.024 U	R	0.02 U
Acetone	61000	630000	0.005 U	0.011 U	0.011 U	0.013 J	0.02 U	0.024 U	R	0.02 U
Benzene	1.1	5.4	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Bromodichloromethane	0.27	1.4	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Bromoform	62	220	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Bromomethane (Methyl bromide)	7.3	32	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Carbon disulfide	820	3700	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Carbon tetrachloride	0.61	3	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Chlorobenzene	290	1400	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Chloroethane	15000	61000	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Chloroform (Trichloromethane)	0.29	1.5	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Chloromethane (Methyl chloride)	120	500	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
cis-1,2-Dichloroethene	160	2000	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
cis-1,3-Dichloropropene	-	-	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Cyclohexane	7000	29000	-	-	-	0.0094 U	0.01 U	0.012 U	0.21 J	0.0098 U
Dibromochloromethane	0.68	3.3	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Dichlorodifluoromethane (CFC-12)	94	400	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Ethylbenzene	5.4	27	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Isopropyl benzene	2100	11000	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Methyl acetate	78000	1000000	-	-	-	0.0094 U	0.01 U	0.012 U	R	0.0098 U
Methyl cyclohexane	-	-	-	-	-	0.0094 U	0.01 U	0.012 U	0.41 J	0.00074 J
Methyl tert butyl ether (MTBE)	43	220	-	-	-	0.019 U	0.02 U	0.024 U	R	0.02 U
Methylene chloride	56	960	-	0.011 JBU	0.016	0.0047 U	0.005 U	0.0061 U	0.5 J	0.0049 U
Styrene	6300	36000	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Tetrachloroethene	22	110	0.005 U	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Toluene	5000	45000	0.005 U	0.011 U	0.01 J	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
trans-1,2-Dichloroethene	150	690	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
trans-1,3-Dichloropropene	-	-	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Trichloroethene	0.91	6.4	0.005 U	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U

TABLE 2.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S10(EPA)*	*S07(OEPA)*	*S08(OEPA)*	*TT-16*	*TT-17*	*TT-17*	*TT-18*	*TT-18*
Sample ID:			*S10*	*96-DV-03-S07*	*96-DV-03-S08*	*S-38443-093008-KMV-033*	*S-38443-093008-KMV-034*	*S-38443-093008-KMV-035*	*S-38443-100108-KMV-036*	*S-38443-100108-KMV-037*
Sample Date:	*USEPA Regional Screening Levels [1]*		*10/23/1990*	*7/9/1996*	*7/9/1996*	*9/30/2008*	*9/30/2008*	*9/30/2008*	*10/1/2008*	*10/1/2008*
Sample Depth:			*0-1 ft BWS*	*0-0.2 ft BWS*	*0.2-0.3 ft BWS*	*2 ft BWS*	*5 ft BWS*	*14 ft BWS*	*5 ft BWS*	*12 ft BWS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*								
Trichlorofluoromethane (CFC-11)	790	3400	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Trifluorotrichloroethane (Freon 113)	43000	180000	-	-	-	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Vinyl chloride	0.06	1.7	-	0.011 U	0.011 U	0.0047 U	0.005 U	0.0061 U	R	0.0049 U
Xylenes (total)	630	2700	0.005 U	0.011 U	0.011 U	0.0094 U	0.01 U	0.012 U	R	0.0021 J
Semi-Volatiles										
1,2,4-Trichlorobenzene	22	99	-	0.38 U	0.37 U	-	-	-	-	-
1,2-Dichlorobenzene	1900	9800	-	0.38 U	0.37 U	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	0.38 U	0.37 U	-	-	-	-	-
1,4-Dichlorobenzene	2.4	12	-	0.38 U	0.37 U	-	-	-	-	-
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4.6	22	-	-	-	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
2,4,5-Trichlorophenol	6100	62000	-	0.94 U	0.92 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
2,4,6-Trichlorophenol	44	160	-	0.38 U	0.37 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
2,4-Dichlorophenol	180	1800	-	0.38 U	0.37 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
2,4-Dimethylphenol	1200	12000	-	0.38 U	0.37 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
2,4-Dinitrophenol	120	1200	-	0.94 U	0.92 U	0.79 U	0.36 U	1.6 U	0.45 U	0.35 U
2,4-Dinitrotoluene	1.6	5.5	-	0.38 U	0.37 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
2,6-Dinitrotoluene	0.33	1.2	-	0.38 U	0.37 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
2-Chloronaphthalene	6300	82000	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
2-Chlorophenol	390	5100	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
2-Methylnaphthalene	230	2200	0.33 U	0.38 U	0.39	0.016 U	0.0073 U	0.042	0.01	0.062
2-Methylphenol	3100	31000	-	0.38 U	0.37 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
2-Nitroaniline	610	6000	-	0.94 U	0.92 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
2-Nitrophenol	-	-	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
3,3'-Dichlorobenzidine	1.1	3.8	-	-	-	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
3-Nitroaniline	-	-	-	0.94 U	0.92 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
4,6-Dinitro-2-methylphenol	4.9	49	-	0.94 U	0.92 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
4-Bromophenyl phenyl ether	-	-	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
4-Chloro-3-methylphenol	6100	62000	-	0.38 U	0.37 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
4-Chloroaniline	2.4	8.6	-	0.38 U	0.37 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
4-Chlorophenyl phenyl ether	-	-	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
4-Methylphenol	6100	62000	-	0.38 U	0.37 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
4-Nitroaniline	24	86	-	0.94 U	0.92 U	0.48 U	0.22 U	1 U	0.27 U	0.21 U
4-Nitrophenol	-	-	-	0.94 U	0.92 U	0.79 U	0.36 U	1.6 U	0.45 U	0.35 U
Acenaphthene	3400	33000	0.11 J	0.38 U	0.091 J	0.045	0.0085	0.25	0.0091 U	0.14
Acenaphthylene	-	-	-	0.38 U	0.37 U	0.087	0.0073 U	0.033 U	0.0091 U	0.008
Acetophenone	7800	100000	-	-	-	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
Anthracene	17000	170000	0.34 J	0.38 U	0.29 J	0.19	0.018	0.37	0.0091 U	0.05
Atrazine	2.1	7.5	-	-	-	0.48 U	0.22 U	1 U	0.27 U	0.21 U
Benzaldehyde	7800	100000	-	-	-	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
Benzo(a)anthracene	0.15	2.1	**1.8[a]**	0.058 J	**1.1[a]**	**0.7[a]**	0.084	**1.2[a]**	0.0091 U	0.078
Benzo(a)pyrene	0.015	0.21	**1.2[ab]**	**0.062 J[a]**	**0.82[ab]**	**0.87[ab]**	**0.089[a]**	**0.99[ab]**	0.0091 U	**0.073[a]**
Benzo(b)fluoranthene	0.15	2.1	**2.5[ab]**	0.38 U	**1[a]**	**1.1[a]**	0.12	**1.3[a]**	0.0091 U	0.1
Benzo(g,h,i)perylene	-	-	0.99	0.38 U	0.16 J	0.63	0.067	0.56	0.0091 U	0.05
Benzo(k)fluoranthene	1.5	21	0.4 J	0.38 U	0.95	0.4	0.059	0.6	0.0091 U	0.042
Biphenyl (1,1-Biphenyl)	51	210	-	-	-	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U

TABLE 2.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S10(EPA)*	*S07(OEPA)*	*S08(OEPA)*	*TT-16*	*TT-17*	*TT-17*	*TT-18*	*TT-18*
Sample ID:			*S10*	*96-DV-03-S07*	*96-DV-03-S08*	*S-38443-093008-KMV-033*	*S-38443-093008-KMV-034*	*S-38443-093008-KMV-035*	*S-38443-100108-KMV-036*	*S-38443-100108-KMV-037*
Sample Date:	*USEPA Regional Screening Levels [1]*		*10/23/1990*	*7/9/1996*	*7/9/1996*	*9/30/2008*	*9/30/2008*	*9/30/2008*	*10/1/2008*	*10/1/2008*
Sample Depth:			*0-1 ft BWS*	*0-0.2 ft BWS*	*0.2-0.3 ft BWS*	*2 ft BWS*	*5 ft BWS*	*14 ft BWS*	*5 ft BWS*	*12 ft BWS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*								
bis(2-Chloroethoxy)methane	180	1800	-	0.38 U	0.37 U	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
bis(2-Chloroethyl)ether	0.21	1	-	0.38 U	0.37 U	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
bis(2-Ethylhexyl)phthalate (DEHP)	35	120	0.33 U	0.032 J	0.23 J	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Butyl benzylphthalate (BBP)	260	910	0.096 J	0.026 J	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Caprolactam	30000	300000	-	-	-	0.79 U	0.36 U	1.6 U	0.45 U	0.35 U
Carbazole	-	-	-	0.38 J	0.28 J	0.09 J	0.055 U	0.4	0.068 U	0.053 U
Chrysene	15	210	0.33 U	0.083 J	1.2	0.82	0.11	1.4	0.0091 U	0.08
Dibenz(a,h)anthracene	0.015	0.21	**0.11 J[a]**	0.38 U	**0.31 J[ab]**	**0.15[a]**	0.014	**0.14[a]**	0.0091 U	0.011
Dibenzofuran	78	1000	0.33 U	0.38 U	0.16 J	0.12 U	0.055 U	0.18 J	0.068 U	0.084
Diethyl phthalate	49000	490000	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Dimethyl phthalate	-	-	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Di-n-butylphthalate (DBP)	6100	62000	0.33 U	0.028 J	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Di-n-octyl phthalate (DnOP)	610	6200	-	0.38 U	0.019 J	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Fluoranthene	2300	22000	2.5	0.11 J	2	1.7	0.23	3.7	0.0091 U	0.19
Fluorene	2300	22000	0.12 J	0.38 U	0.087 J	0.064	0.0085	0.25	0.0091 U	0.1
Hexachlorobenzene	0.3	1.1	-	0.38 U	0.37 U	0.016 U	0.0073 U	0.033 U	0.0091 U	0.0071 U
Hexachlorobutadiene	6.2	22	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Hexachlorocyclopentadiene	370	3700	-	0.38 U	0.37 U	0.79 U	0.36 U	1.6 U	0.45 U	0.35 U
Hexachloroethane	12	43	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Indeno(1,2,3-cd)pyrene	0.15	2.1	**0.97[a]**	0.048 J	**0.48[a]**	**0.54[a]**	0.055	**0.53[a]**	0.0091 U	0.045
Isophorone	510	1800	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Naphthalene	3.6	18	0.33 U	0.38 U	0.25 J	0.016 U	0.0073 U	0.11	0.0091 U	0.046
Nitrobenzene	4.8	24	-	0.38 U	0.37 U	0.24 U	0.11 U	0.5 U	0.14 U	0.11 U
N-Nitrosodi-n-propylamine	0.069	0.25	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
N-Nitrosodiphenylamine	99	350	0.33 U	0.38 U	0.027 J	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Pentachlorophenol	0.89	2.7	-	0.94 U	0.92 U	0.36 U	0.16 U	0.75 U	0.2 U	0.16 U
Phenanthrene	-	-	1.8	0.063 J	1.7	0.85	0.14	3.4	0.0091 U	0.25
Phenol	18000	180000	-	0.38 U	0.37 U	0.12 U	0.055 U	0.25 U	0.068 U	0.053 U
Pyrene	1700	17000	3.4	0.13 J	1.9	1.4	0.18	2.9	0.0091 U	0.16
Metals										
Aluminum	77000	990000	10600	6890	14300	5270	6830	3180	5680	2310
Antimony	31	410	2.4 U	0.68 U	**278[a]**	7.2 UJ	6.6 UJ	0.65 J	0.78 J	6.4 U
Arsenic	0.61	2.4	**8.1[ab]**	**6.0[ab]**	**141[ab]**	**5.5[ab]**	**6.8[ab]**	**10.9[ab]**	**17.7[ab]**	**2.9[ab]**
Barium	15000	190000	120	112	13000	53.8	78.0	73.0	389	17.8 J
Beryllium	160	2000	0.35 B	0.62 B	0.77 B	0.24 J	0.33 J	0.36 J	0.97	0.099 J
Cadmium	70	800	1 U	0.57 B	0.69 B	0.29 J	0.18 J	0.11 J	0.68 U	0.10 J
Calcium	-	-	83700	12900	5410	91200 J	50600 J	27500 J	5650	142000
Chromium	-	-	27.6	17.3	62.0	7.8	10.4	8.1	11.7	4.6
Cobalt	23	300	4.7 B	6.6 B	17.5	4.8 J	6.3	2.6 J	4.5 J	2.8 J
Copper	3100	41000	37.6 EJ	22.5	1830	12.6	12.3	21.3	17.2	8.6
Iron	55000	720000	16300	13200	**59500[a]**	11200	14200	12000	9890	6040
Lead	400	800	94.8	31.5	**652[a]**	18.4 J	14.9 J	7.5 J	6.4 J	9.1 J
Magnesium	-	-	28000	6100	2480	44300	13800	13400	1290	53600
Manganese	1800	23000	446	681	614	624 J	441 J	76.0 J	84.9	297
Mercury	10	43	0.008 U	0.18	0.11 U	0.035 J	0.040 J	0.054 J	0.14 U	0.11 U

TABLE 2.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S10(EPA)*	*S07(OEPA)*	*S08(OEPA)*	*TT-16*	*TT-17*	*TT-17*	*TT-18*	*TT-18*
Sample ID:			*S10*	*96-DV-03-S07*	*96-DV-03-S08*	*S-38443-093008-KMV-033*	*S-38443-093008-KMV-034*	*S-38443-093008-KMV-035*	*S-38443-100108-KMV-036*	*S-38443-100108-KMV-037*
Sample Date:	*USEPA Regional Screening Levels [1]*		*10/23/1990*	*7/9/1996*	*7/9/1996*	*9/30/2008*	*9/30/2008*	*9/30/2008*	*10/1/2008*	*10/1/2008*
Sample Depth:			*0-1 ft BWS*	*0-0.2 ft BWS*	*0.2-0.3 ft BWS*	*2 ft BWS*	*5 ft BWS*	*14 ft BWS*	*5 ft BWS*	*12 ft BWS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*								
Nickel	1500	20000	23.1	12.9	78.3	10.7	11.0	7.5	8.8	7.4
Potassium	-	-	1190 B	886 B	1400	960 J	725 J	399 J	1070	365 J
Selenium	390	5100	2.6	0.90 U	2.1	30.0 U	27.5 U	1.1 J	3.7 J	26.6 U
Silver	390	5100	1.1 B	0.45 B	0.23 B	1.2 U	1.1 U	1.2 U	1.4 U	1.1 U
Sodium	-	-	136 B	207 B	254 B	162 J	550 U	625 U	130 J	177 J
Thallium	0.78	10	2 U	2.2 B[a]	4.0[a]	0.14 U	0.15 U	0.46	0.54	0.11 U
Vanadium	390	5200	24.3	17.4	18.5	14.5 J	18.1 J	13.8 J	28.2	6.2
Zinc	23000	310000	126	76.9	286	42.4 J	40.0 J	27.3 J	10.3	23.2
PCBs										
Aroclor-1016 (PCB-1016)	3.9	21	-	0.038 U	0.037 U	0.04 UJ	0.036 UJ	0.041 U	0.045 UJ	0.035 UJ
Aroclor-1221 (PCB-1221)	0.14	0.54	-	0.076 U	0.074 U	0.04 UJ	0.036 UJ	0.041 U	0.045 UJ	0.035 UJ
Aroclor-1232 (PCB-1232)	0.14	0.54	-	0.038 U	0.037 U	0.04 UJ	0.036 UJ	0.041 U	0.045 UJ	0.035 UJ
Aroclor-1242 (PCB-1242)	0.22	0.74	-	0.038 U	0.037 U	0.04 UJ	0.036 UJ	0.041 U	0.045 UJ	0.035 UJ
Aroclor-1248 (PCB-1248)	0.22	0.74	1.4 X[ab]	0.038 U	0.037 U	0.04 UJ	0.036 UJ	0.059	0.045 UJ	0.035 UJ
Aroclor-1254 (PCB-1254)	0.22	0.74	-	0.038 U	0.037 U	0.04 UJ	0.036 UJ	0.041 U	0.045 UJ	0.035 UJ
Aroclor-1260 (PCB-1260)	0.22	0.74	0.41 X[a]	0.038 U	0.037 U	0.04 UJ	0.036 UJ	0.041 U	0.045 UJ	0.035 UJ
Pesticides										
4,4'-DDD	2	7.2	-	0.00065 J	0.0037 U	0.1 UJ	0.19 UJ	0.042 UJ	0.023 UJ	0.036 UJ
4,4'-DDE	1.4	5.1	-	0.0038 U	0.0024 PJ	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
4,4'-DDT	1.7	7	-	0.0016 PJ	0.0088 P	0.1 UJ	0.19 UJ	0.042 UJ	0.023 UJ	0.036 UJ
Aldrin	0.029	0.1	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
alpha-BHC	0.077	0.27	-	0.0019 U	0.00071 PJ	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
alpha-Chlordane	-	-	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
beta-BHC	0.27	0.96	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
delta-BHC	-	-	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Dieldrin	0.03	0.11	-	0.0038 U	0.0037 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Endosulfan I	370	3700	-	0.00042 PJ	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Endosulfan II	370	3700	-	0.0014 J	0.0054	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Endosulfan sulfate	-	-	-	0.0038 U	0.0037 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Endrin	18	180	-	0.0038 U	0.0037 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Endrin aldehyde	-	-	-	0.0064 P	0.0037 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Endrin ketone	-	-	-	0.0038 U	0.0037 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
gamma-BHC (lindane)	0.52	2.1	-	0.0019 U	0.0018 J	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
gamma-Chlordane	-	-	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Heptachlor	0.11	0.38	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Heptachlor epoxide	0.053	0.19	-	0.0019 U	0.0019 U	0.1 U	0.19 U	0.042 U	0.023 U	0.036 U
Methoxychlor	310	3100	-	0.019 U	0.019 U	0.2 UJ	0.36 UJ	0.082 UJ	0.045 UJ	0.07 UJ
Toxaphene	0.44	1.6	-	0.19 U	0.19 U	4 UJ	7.4 UJ	1.7 UJ	0.91 UJ	1.4 UJ

TABLE 2.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S10(EPA)*	*S07(OEPA)*	*S08(OEPA)*	*TT-16*	*TT-17*	*TT-17*	*TT-18*	*TT-18*
Sample ID:			*S10*	*96-DV-03-S07*	*96-DV-03-S08*	*S-38443-093008-KMV-033*	*S-38443-093008-KMV-034*	*S-38443-093008-KMV-035*	*S-38443-100108-KMV-036*	*S-38443-100108-KMV-037*
Sample Date:	*USEPA Regional Screening Levels [1]*		*10/23/1990*	*7/9/1996*	*7/9/1996*	*9/30/2008*	*9/30/2008*	*9/30/2008*	*10/1/2008*	*10/1/2008*
Sample Depth:			*0-1 ft BWS*	*0-0.2 ft BWS*	*0.2-0.3 ft BWS*	*2 ft BWS*	*5 ft BWS*	*14 ft BWS*	*5 ft BWS*	*12 ft BWS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*								
Herbicides										
2,4,5-TP (Silvex)	490	4900	-	-	-	0.024 U	0.022 U	0.025 U	0.027 U	0.021 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	690	7700	-	-	-	0.096 U	0.088 U	0.1 U	0.11 U	0.085 U
General Chemistry										
Cyanide (total)	22	140	-	0.30 B	2.3	0.60 U	0.55 U	0.25 J	0.68 U	0.52 J
Total solids (%)	-	-	-	-	-	83.3	91.0	80.1	73.2	94.1

Notes:

All concentrations are expressed in units of milligrams per kilogram (mg/kg) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013

ft BWS - Feet below water surface

B - Compound is found in the associated blank as well as in the sample (Organics).

E - Estimated or not reported due to interference. (Inorganics)

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument. (Organics)

J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.

R - The parameter was rejected.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

X - Denotes manually entered data. This always occurs on multi-component quantitations and sometimes occurs on individual pesticides when the analyst had to correct the integration of a peak.

- - Not applicable.

TABLE 2.2

HISTORIC SURFACE WATER ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:					*SW-1-99*	*SW-1-00*	*SW-2-99*	*SW-2-00*	*SW-3-99*	*SW-3-00*
Sample ID:					*SW-1*	*SW-1*	*SW-2*	*SW-2*	*SW-3*	*SW-3*
Sample Date:					*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*
	USEPA Regional Screening Levels [1]		*Ecological Screening Value*	*Ecological Screening Value Reference [2]*						
Parameter	*MCL a*	*TapWater b*	*c*							
Volatiles										
1,1,1-Trichloroethane	0.2	7.5	0.076	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2,2-Tetrachloroethane	-	0.000066	0.26	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2-Trichloroethane	0.005	0.00024	0.74	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethane	-	0.0024	0.047	EPA R V	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethene	0.007	0.26	0.21	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethane	0.005	0.00015	2	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethene (total)	-	0.13	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloropropane	0.005	0.00038	0.36	EPA R V	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	4.9	22	O OMZA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
2-Hexanone	-	0.034	-	-	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	1	0.17	EPA R V	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone	-	12	1.7	EPA R V	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Benzene	0.005	0.00039	0.16	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromodichloromethane	0.08	0.00012	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromoform	0.08	0.0079	0.23	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromomethane (Methyl bromide)	-	0.007	0.016	EPA R V	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon disulfide	-	0.72	0.015	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Carbon tetrachloride	0.005	0.00039	0.24	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chlorobenzene	0.1	0.072	0.047	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloroethane	-	21	1.1	M. C	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform (Trichloromethane)	0.08	0.00019	0.14	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloromethane (Methyl chloride)	-	0.19	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	-	-	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Dibromochloromethane	0.08	0.00015	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Ethylbenzene	0.7	0.0013	0.061	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Methylene chloride	0.005	0.0099	1.9	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Styrene	0.1	1.1	0.032	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Tetrachloroethene	0.005	0.0097	0.053	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Toluene	1	0.86	0.062	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
trans-1,3-Dichloropropene	-	-	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Trichloroethene	0.005	0.00044	0.22	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Vinyl chloride	0.002	0.000015	0.93	O OMZA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylenes (total)	10	0.19	0.027	O OMZA	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.
MCL - Maximum contaminant level.
U - Compound was analyzed for but not detected.
[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013
[2] - Ohio OMZA: Ohio River Basin Aquatic Life and Human Health Tier I Criteria and Tier II Values, Outside Mixing Zone Area OAC 3745-1-32, July 27, 2005.
USEPA NRWQC: National Recommended Water Quality Criteria, EPA-822-R-02-047, Continuous Chronic Concentration, Office of Water, November 2002.
EPA Region V: Ecological Data Quality Levels, August 22, 2003. Available on the Internet at http://www.epa.gov/Region5/rcraca/edql.html

TABLE 2.3

HISTORIC SEDIMENT ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location: [5]					*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample ID: [5]					*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample Date:					*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*
Sample Depth:					*15-18 ft BWS*	*15-18 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*-*	*-*	*-*	*-*	*-*	*-*
Sample Location:	*USEPA Regional Screening Levels [1]*		*USEPA Ecological Screening Levels [2]*	*Ecological Screening Values [3][4]*	*Quarry Pond*	*Quarry Pond*	*GMR*	*Duplicate GMR*	*GMR*	*GMR*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*	*c*	*d*												
Volatiles																
1,1,1-Trichloroethane	8700	38000	0.213	0.170	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2,2-Tetrachloroethane	0.56	2.8	0.85	0.94	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2-Trichloroethane	1.1	5.3	0.518	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethane	3.3	17	0.000575	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethene	240	1100	0.0194	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethane	0.43	2.2	0.26	0.4	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethene (total)	700	9200	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloropropane	0.94	4.7	0.333	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
2-Butanone (Methyl ethyl ketone) (MEK)	28000	200000	0.0424	-	0.026 U	0.01 J	0.015 U	0.014 U	0.005 J	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
2-Hexanone	210	1400	0.0582	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Methyl isobutyl ketone (MIBK)	5300	53000	0.0251	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone	61000	630000	0.0099	-	**0.047[c]**	**0.043[c]**	0.015 U	0.014 U	**0.033[c]**	**0.019[c]**	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	**0.037[c]**
Benzene	1.1	5.4	0.142	0.05	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromodichloromethane	0.27	1.4	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromoform	62	220	0.492	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromomethane (Methyl bromide)	7.3	32	0.00137	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon disulfide	820	3700	0.0239	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Carbon tetrachloride	0.61	3	1.45	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chlorobenzene	290	1400	0.291	0.82	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloroethane	15000	61000	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform (Trichloromethane)	0.29	1.5	0.121	0.001	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloromethane (Methyl chloride)	120	500	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	-	-	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Dibromochloromethane	0.68	3.3	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Ethylbenzene	5.4	27	0.175	0.05	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Methylene chloride	56	960	0.159	2	0.026 BUJ	0.029 BUJ	0.015 BUJ	0.014 BUJ	0.018 BUJ	0.018 BUJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Styrene	6300	36000	0.254	0.1	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Tetrachloroethene	22	110	0.99	0.01	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Toluene	5000	45000	1.22	0.05	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.001 J	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.014
trans-1,3-Dichloropropene	-	-	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Trichloroethene	0.91	6.4	0.112	0.001	0.0008 J	0.029 U	0.0007 J	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Vinyl chloride	0.06	1.7	0.202	0.01	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylenes (total)	630	2700	0.433	0.05	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Semi-Volatiles																
1,2,4-Trichlorobenzene	22	99	5.062	9.2	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
1,2-Dichlorobenzene	1900	9800	0.294	0.3	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	1.315	1.7	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
1,4-Dichlorobenzene	2.4	12	0.318	0.35	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4,5-Trichlorophenol	6100	62000	-	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
2,4,6-Trichlorophenol	44	160	0.208	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4-Dichlorophenol	180	1800	0.0817	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4-Dimethylphenol	1200	12000	0.304	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4-Dinitrophenol	120	1200	0.00621	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
2,4-Dinitrotoluene	1.6	5.5	0.0144	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,6-Dinitrotoluene	0.33	1.2	0.0398	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Chloronaphthalene	6300	82000	0.417	1	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Chlorophenol	390	5100	0.0319	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Methylnaphthalene	230	2200	0.0202	0.330	**0.12 J[c]**	**0.075 J[c]**	**0.023 J[c]**	0.019 J	0.016 J	**0.031 J[c]**	-	-	-	-	-	-

TABLE 2.3

HISTORIC SEDIMENT ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location: [5]					*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample ID: [5]					*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample Date:					*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*
Sample Depth:					*15-18 ft BWS*	*15-18 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*-*	*-*	*-*	*-*	*-*	*-*
Sample Location:	*USEPA Regional Screening Levels [1]*		*USEPA Ecological Screening Levels [2]*	*Ecological Screening Values [3][4]*	*Quarry Pond*	*Quarry Pond*	*GMR*	*Duplicate GMR*	*GMR*	*GMR*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*	*c*	*d*												
2-Methylphenol	3100	31000	0.0554	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Nitroaniline	610	6000	-	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
3,3'-Dichlorobenzidine	1.1	3.8	0.127	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	4.9	49	0.104	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	1.55	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Chloro-3-methylphenol	6100	62000	0.388	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Chloroaniline	2.4	8.6	0.146	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Methylphenol	6100	62000	0.0202	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Nitroaniline	24	86	-	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
4-Nitrophenol	-	-	0.0133	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
Acenaphthene	3400	33000	0.00671	0.330	**0.059 J[c]**	**0.092 J[c]**	**0.021 J[c]**	**0.015 J[c]**	**0.04 J[c]**	**0.089 J[c]**	-	-	-	-	-	-
Acenaphthylene	-	-	0.00587	0.33	0.85 U	**0.061 J[c]**	**0.16 J[c]**	**0.15 J[c]**	**0.014 J[c]**	**0.022 J[c]**	-	-	-	-	-	-
Anthracene	17000	170000	0.0572	0.33	**0.11 J[c]**	**0.23 J[c]**	**0.4 J[cd]**	**0.39 J[cd]**	**0.075 J[c]**	**0.17 J[c]**	-	-	-	-	-	-
Benzo(a)anthracene	0.15	2.1	0.108	0.33	**0.49 J[acd]**	**1.5[acd]**	**2.2[abcd]**	**2.1[acd]**	**0.6[acd]**	**1.3[acd]**	-	-	-	-	-	-
Benzo(a)pyrene	0.015	0.21	0.15	0.33	**0.46 J[abcd]**	**1.8[abcd]**	**2.1[abcd]**	**2.1[abcd]**	**0.58[abcd]**	**1.1[abcd]**	-	-	-	-	-	-
Benzo(b)fluoranthene	0.15	2.1	10.4	-	**0.8 J[a]**	**2.5[ab]**	**2.7[ab]**	**2.3[ab]**	**1[a]**	**1.8[a]**	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	0.17	-	**0.49 J[c]**	**2[c]**	**2.2[c]**	**1.6[c]**	**0.66[c]**	**1.4[c]**	-	-	-	-	-	-
Benzo(k)fluoranthene	1.5	21	0.24	-	**0.3 J[c]**	**0.95[c]**	**0.93[c]**	**0.93[c]**	**0.41 J[c]**	**0.69[c]**	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	180	1800	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
bis(2-Chloroethyl)ether	0.21	1	3.52	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	35	120	0.182	0.182	0.85 U	**0.47 J[cd]**	0.5 U	0.084 J	**0.33 J[cd]**	**0.36 J[cd]**	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	260	910	1.97	11	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.084 J	-	-	-	-	-	-
Carbazole	-	-	-	-	0.085 J	0.11 J	0.02 J	0.015 J	0.084 J	0.19 J	-	-	-	-	-	-
Chrysene	15	210	0.166	0.33	**0.55 J[cd]**	**1.5[cd]**	**2.5[cd]**	**2.1[cd]**	**0.71[cd]**	**1.5[cd]**	-	-	-	-	-	-
Dibenz(a,h)anthracene	0.015	0.21	0.033	0.33	**0.12 J[ac]**	**0.48 J[abcd]**	**0.43 J[abcd]**	**0.32 J[abc]**	**0.15 J[ac]**	**0.31 J[abc]**	-	-	-	-	-	-
Dibenzofuran	78	1000	0.449	2.0	0.07 J	0.095 J	0.011 J	0.007 J	0.034 J	0.1 J	-	-	-	-	-	-
Diethyl phthalate	49000	490000	0.295	0.630	0.85 U	0.039 J	0.024 J	0.027 J	0.051 J	0.033 J	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	6100	62000	1.114	11	0.85 BUJ	0.94 BUJ	0.5 BUJ	0.46 BUJ	0.58 BUJ	0.6 BUJ	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	610	6200	40.6	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Fluoranthene	2300	22000	0.423	0.330	**1.1[cd]**	**2.6[cd]**	**2[cd]**	**2[cd]**	**1.4[cd]**	**2.2[cd]**	-	-	-	-	-	-
Fluorene	2300	22000	0.0774	0.330	0.076 J	**0.16 J[c]**	0.053 J	0.043 J	0.06 J	**0.13 J[c]**	-	-	-	-	-	-
Hexachlorobenzene	0.3	1.1	0.02	0.0025	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Hexachlorobutadiene	6.2	22	0.0265	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Hexachlorocyclopentadiene	370	3700	0.901	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Hexachloroethane	12	43	0.584	1	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.15	2.1	0.2	-	**0.46 J[ac]**	**1.9[ac]**	**1.9[ac]**	**1.4[ac]**	**0.65[ac]**	**1.4[ac]**	-	-	-	-	-	-
Isophorone	510	1800	0.432	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Naphthalene	3.6	18	0.176	0.330	0.07 J	0.077 J	0.031 J	0.025 J	0.018 J	0.063 J	-	-	-	-	-	-
Nitrobenzene	4.8	24	0.145	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	0.069	0.25	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
N-Nitrosodiphenylamine	99	350	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Pentachlorophenol	0.89	2.7	23	0.002	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
Phenanthrene	-	-	0.204	0.33	**0.89[cd]**	**1.5[cd]**	**0.7[cd]**	**0.61[cd]**	**0.83[cd]**	**1.9[cd]**	-	-	-	-	-	-
Phenol	18000	180000	0.0491	0.05	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Pyrene	1700	17000	0.195	0.33	**1.3[cd]**	**3[cd]**	**4.7 E[cd]**	**3.7 E[cd]**	**1.4[cd]**	**2.7[cd]**	-	-	-	-	-	-

TABLE 2.3

HISTORIC SEDIMENT ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location: [5]					*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample ID: [5]					*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample Date:					*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*
Sample Depth:					*15-18 ft BWS*	*15-18 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*-*	*-*	*-*	*-*	*-*	*-*
Sample Location:	*USEPA Regional Screening Levels [1]*		*USEPA Ecological Screening Levels [2]*	*Ecological Screening Values [3][4]*	*Quarry Pond*	*Quarry Pond*	*GMR*	*Duplicate GMR*	*GMR*	*GMR*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*	*c*	*d*												
Metals																
Aluminum	77000	990000	-	-	2750	6590	9750	8450	8940	8600	-	-	-	-	-	-
Antimony	31	410	-	12	9.1 U	13.5 U	7.9 U	8.1 U	10 U	10.1 U	-	-	-	-	-	-
Arsenic	0.61	2.4	9.79	0.724	**10.3[abcd]**	**12.6[abcd]**	**9.2[abd]**	**9.2[abd]**	**6.0[abd]**	**9[abd]**	-	-	-	-	-	-
Barium	15000	190000	-	200	73.0	137	128	125	117	130	-	-	-	-	-	-
Beryllium	160	2000	-	-	0.28 B	0.35 B	0.54 B	0.48 B	0.5 B	0.47 B	-	-	-	-	-	-
Cadmium	70	800	0.99	1.0	1.0 U	1.5 U	0.89 U	0.91 U	1.1 U	1.1 U	-	-	-	-	-	-
Calcium	-	-	-	-	53600	11800	61700	58100	81900	74900	-	-	-	-	-	-
Chromium	-	-	43.4	52.3	23.1	17.2	14.9	13.7	18	22.3	-	-	-	-	-	-
Cobalt	23	300	50	20	3.7 B	6.7 B	6.6 B	6.2 B	6.5 B	7.2 B	-	-	-	-	-	-
Copper	3100	41000	31.6	18.7	**29.3[d]**	**24.7[d]**	**29.3[d]**	**29.0[d]**	**26[d]**	**33.5[cd]**	-	-	-	-	-	-
Iron	55000	720000	-	-	11300	13500	16400	15500	15000	15800	-	-	-	-	-	-
Lead	400	800	35.8	30.2	**33.7[d]**	**42.0[cd]**	**51.6[cd]**	**47.2[cd]**	**30.5[d]**	**47.9[cd]**	-	-	-	-	-	-
Magnesium	-	-	-	-	13600	21600	17200	16100	24200	20600	-	-	-	-	-	-
Manganese	1800	23000	-	-	205	545	299	258	330	420	-	-	-	-	-	-
Mercury	10	43	0.174	0.130	0.08 U	0.12 U	**0.63[cd]**	**0.65[cd]**	0.09 U	0.13 B	-	-	-	-	-	-
Nickel	1500	20000	22.7	15.9	13.4	**18.7 B[d]**	**16.2[d]**	**17.9[d]**	**19.9[d]**	**23.7[cd]**	-	-	-	-	-	-
Potassium	-	-	-	-	297 B	736 B	812 B	709 B	1090 B	991 B	-	-	-	-	-	-
Selenium	390	5100	-	-	1.1 B	0.59 B	0.4 B	0.59 B	0.73 B	0.59 B	-	-	-	-	-	-
Silver	390	5100	0.5	2	1.4 U	2.1 U	1.2 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
Sodium	-	-	-	-	165 B	206 B	144 B	131 B	191 B	183 B	-	-	-	-	-	-
Thallium	0.78	10	-	-	0.68 B	0.98 U	**1.0 B[a]**	0.66 B	**0.84 B[a]**	**0.9 B[a]**	-	-	-	-	-	-
Vanadium	390	5200	-	-	9.6 B	16.8 B	21.8	19.2	20.2	20	-	-	-	-	-	-
Zinc	23000	310000	121	12.4	**80.7[d]**	**143[cd]**	**93.6 B[d]**	**80.4[d]**	**114[d]**	**132[cd]**	-	-	-	-	-	-
PCBs																
Aroclor-1016 (PCB-1016)	3.9	21	-	-	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	0.14	0.54	-	0.067	0.18 U	0.19 U	0.1 U	0.093 U	0.12 U	0.12 U	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	0.14	0.54	-	-	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	0.22	0.74	-	-	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	0.22	0.74	-	-	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	0.22	0.74	-	0.060	**0.66[ad]**	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	0.22	0.74	-	-	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Pesticides																
4,4'-DDD	2	7.2	0.00488	0.0033	0.0017 JP	0.0094 U	0.0022 JP	**0.0049[cd]**	**0.0034 JP[d]**	**0.0036 JP[d]**	-	-	-	-	-	-
4,4'-DDE	1.4	5.1	0.00316	0.0033	0.0087 U	0.0022 JP	0.0050 U	0.0046 U	0.0026 JP	0.0024 JP	-	-	-	-	-	-
4,4'-DDT	1.7	7	0.00416	0.0033	**0.0044 JP[cd]**	0.0024 JP	0.0021 JP	0.0022 JP	0.0027 JP	0.0023 JP	-	-	-	-	-	-
Aldrin	0.029	0.1	0.002	0.0025	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0013 JP	-	-	-	-	-	-
alpha-BHC	0.077	0.27	0.006	-	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
alpha-Chlordane	-	-	-	-	0.012	0.0018 JP	0.00072 JP	0.0024 U	0.0070 P	0.0066 P	-	-	-	-	-	-
beta-BHC	0.27	0.96	0.005	-	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
delta-BHC	-	-	71.5	-	0.0045 U	0.0049 U	0.0014 JP	0.0015 JP	0.0030 U	0.0031 U	-	-	-	-	-	-
Dieldrin	0.03	0.11	0.0019	0.0033	**0.0096 P[cd]**	**0.0026 JP[c]**	0.00086 JP	0.0046 U	**0.0025 JP[c]**	**0.0040 JP[cd]**	-	-	-	-	-	-
Endosulfan I	370	3700	0.00326	-	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
Endosulfan II	370	3700	0.00194	-	0.0087 U	0.0094 U	0.0050 U	0.0046 U	0.0058 U	0.0060 U	-	-	-	-	-	-
Endosulfan sulfate	-	-	0.0346	-	0.0037 JP	0.0094 U	0.0050 U	0.0046 U	0.0030 JP	0.0060 U	-	-	-	-	-	-
Endrin	18	180	0.00222	0.033	**0.034[cd]**	0.0094 U	**0.0034 JP[c]**	**0.0048 P[c]**	**0.0024 JP[c]**	0.0060 U	-	-	-	-	-	-
Endrin aldehyde	-	-	0.48	-	0.0079 JP	0.0094 U	0.0050 U	0.0046 U	0.0058 U	0.0060 U	-	-	-	-	-	-
Endrin ketone	-	-	-	-	0.0087 U	0.0049 J	0.0032 JP	0.0040 JP	0.0058 U	0.0025 JP	-	-	-	-	-	-

TABLE 2.3

HISTORIC SEDIMENT ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location: [5]					*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample ID: [5]					*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SEDIMENT-1*	*SED-1*	*SEDIMENT-2*	*SED-2*	*SEDIMENT-3*	*SED-3*
Sample Date:					*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*
Sample Depth:					*15-18 ft BWS*	*15-18 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*0-0.5 ft BWS*	*-*	*-*	*-*	*-*	*-*	*-*
Sample Location:	*USEPA Regional Screening Levels [1]*		*USEPA Ecological Screening Levels [2]*	*Ecological Screening Values [3][4]*	*Quarry Pond*	*Quarry Pond*	*GMR*	*Duplicate GMR*	*GMR*	*GMR*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*	*Quarry Pond*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*	*c*	*d*												
gamma-BHC (lindane)	0.52	2.1	0.00237	-	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	0.0049 P	0.0032 J	0.0014 J	0.0024 U	0.0069	0.0056 P	-	-	-	-	-	-
Heptachlor	0.11	0.38	0.0006	-	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
Heptachlor epoxide	0.053	0.19	0.00247	0.0006	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
Methoxychlor	310	3100	0.0136	0.019	**0.018 J[c]**	**0.017 JP[c]**	**0.05[cd]**	**0.065[cd]**	0.0089 JP	0.012 JP	-	-	-	-	-	-
Toxaphene	0.44	1.6	0.000077	0.028	0.45 U	0.49 U	0.26 U	0.24 U	0.3 U	0.31 U	-	-	-	-	-	-
General Chemistry																
Cyanide (total)	22	140	0.0001	-	**0.27 B[c]**	0.17 U	**0.19 B[c]**	**0.21 B[c]**	**0.23 B[c]**	**0.32 B[c]**	-	-	-	-	-	-
Percent moisture (%)	-	-	-	-	-	-	-	-	-	-	13.5	15	15.0	13	20.3	32
Total organic carbon (TOC)	-	-	-	-	-	-	-	-	-	-	390	-	550	-	100 U	-

Notes:

All concentrations are expressed in units of milligrams per kilogram (mg/kg) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013.

[2] - United States Environmental Protection Agency RCRA Ecological Screening Levels, August 22, 2003

[3] - USEPA. 2001. Supplemental Guidance to RAGS: Region 4 Bulletins, Ecological Risk Assessment.

Originally published November 1995. Website version last updated November 30, 2001:

http://www.epa.gov/region4/superfund/programs/riskassess/ecolbul.html

[4] - G.P. Friday, 1998. Ecological Screening Values for Surface Water, Sediment, and Soil.

Wesinghouse Savannah River Company. Report WSRC-TR-98-00110

[5] - Sample IDs and locations SEDIMENT-1, SEDIMENT-2, SEDIMENT-3 are equivalent to SED-1, SED-2 and SED-3, respectively

ft BWS - Feet below water surface

GMR - Great Miami River

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

U - Compound was analyzed for but not detected.

- - Not applicable.

TABLE 2.4

HISTORIC SOIL VAPOR VOC ANALYTICAL RESULTS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:					*GP06-09*	*GP07-09*	*GP08-09*	*GP09-09*	*GP10-09*
Sample ID:					*A-038443-091609-NH-019*	*A-038443-091609-GL-020*	*A-038443-091709-NH-021*	*A-038443-091509-NH-009*	*A-038443-091509-GL-010*
Sample Date:					*9/16/2009*	*9/16/2009*	*9/17/2009*	*9/15/2009*	*9/15/2009*
	RESIDENTIAL SVSL		*INDUSTRIAL SVSL*						
Parameter	*ELCR*	*HI*	*ELCR*	*HI*					
	a	*b*	c	d					
Volatiles									
1,1,1-Trichloroethane	-	52000	-	220000	1.6 U	55 U	0.93 J	18	14
1,1,2,2-Tetrachloroethane	0.42	-	2.1	-	2.1 U	70 U	2.1 U	2.1 U	2.1 U
1,1,2-Trichloroethane	1.5	2.1	7.7	8.8	1.6 U	55 U	1.6 U	1.6 U	1.6 U
1,1-Dichloroethane	15	-	77	-	1.2 U	41 U	1.2 U	1.2 U	2.1
1,1-Dichloroethene	-	2100	-	8800	0.79 U	40 U	0.79 U	0.79 U	0.79 U
1,2,4-Trichlorobenzene	-	21	-	88	5.9 U	190 U	5.9 U	5.9 U	5.9 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0016	2.1	0.02	8.8	9.7 UJ	490 UJ	9.7 UJ	9.7 UJ	9.7 UJ
1,2-Dibromoethane (Ethylene dibromide)	0.041	94	0.20	390	3.1 U	78 U	3.1 U	3.1 U	3.1 U
1,2-Dichlorobenzene	-	2100	-	8800	2.4 U	61 U	2.4 U	2.4 U	2.4 U
1,2-Dichloroethane	0.94	73	4.7	310	0.81 U	62 U	0.81 U	0.81 U	0.81 U
1,2-Dichloropropane	2.4	42	12	180	0.92 U	70 U	0.92 U	0.92 U	0.92 U
1,3-Dichlorobenzene[w]	2.2	8300	11	35000	2.4 U	120 U	2.0 J	2.4 U	2.4 U
1,4-Dichlorobenzene	2.2	8300	11	35000	2.4 U	120 U	2.4 U	2.4 U	2.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	52000	-	220000	2.9 U	150 U	1.9 J	1.5 J	3.2
2-Hexanone	-	310	-	1300	2.0 U	210 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	31000	-	130000	1.6 U	210 U	1.6 U	1.6 U	3.9 J
Acetone	-	320000	-	1400000	7.1 U	120 U	17 UJ	11 U	21 U
Benzene	3.1	310	16	1300	0.96 U	49 U	1.8	1.9	1.7
Bromodichloromethane	0.66	-	3.3	-	2.0 U	68 U	2.0 U	2.0 U	2.0 U
Bromoform	22	-	110	-	4.1 U	100 U	4.1 U	4.1 U	4.1 U
Bromomethane (Methyl bromide)	-	52	-	220	1.6 U	79 U	1.6 U	1.6 U	1.6 U
Carbon disulfide	-	7300	-	31000	6.5	160 U	8.4	13	11
Carbon tetrachloride	4.1	1000	20	4400	1.9 U	64 U	1.9 U	1.9 U	1.9 U
Chlorobenzene	-	520	-	2200	1.4 U	47 U	1.4 U	1.9	1.4 U
Chloroethane	-	100000	-	440000	1.1 U	53 U	1.1 U	1.1 U	1.1 U
Chloroform (Trichloromethane)	1.1	1000	5.3	4300	1.5 U	49 U	**1.2 J[a]**	**14[ac]**	**4.5[a]**
Chloromethane (Methyl chloride)	-	940	-	3900	1.7 U	42 UJ	1.7 U	1.5 J	1.2 J
cis-1,2-Dichloroethene[x]	-	630	-	2600	0.79 U	40 U	0.79 U	1.4	0.79 U
cis-1,3-Dichloropropene[y]	6.1	210	31	880	1.8 U	46 U	1.8 U	1.8 U	1.8 U
Cyclohexane	-	63000	-	260000	1.7 U	35 U	2.1	1.7 U	1.7 U
Dibromochloromethane	0.9	-	4.5	-	3.4 U	86 U	3.4 U	3.4 U	3.4 U
Dichlorodifluoromethane (CFC-12)	-	1000	-	4400	4.0	75 U	63	2.5	24
Ethylbenzene	9.7	10000	49	44000	1.3 U	44 U	4.4	3.2	5.4
Isopropyl benzene	-	4200	-	18000	2.5 U	50 U	2.5 U	2.5 U	2.5 U
Methyl tert butyl ether (MTBE)	94	31000	470	130000	3.6 U	37 U	3.6 U	3.6 U	1.4 J
Methylene chloride	960	6300	12000	26000	1.0 U	19 J	0.55 J	1.0 U	1.0 U
Naphthalene	0.72	31	3.6	130	2.6 U	160 U	2.6 U	**3.8[ac]**	**7.9[ac]**
Styrene	-	10000	-	44000	1.7 U	43 U	1.7 U	1.7 U	1.7 U
Tetrachloroethene	94	420	470	1800	1.5 J	69 U	25	**120[a]**	40
Toluene	-	52000	-	220000	1.1 U	27 J	22	12	18
trans-1,2-Dichloroethene	-	630	-	2600	0.79 U	40 U	0.79 U	0.79 U	0.79 U
trans-1,3-Dichloropropene[z]	6.1	210	31	880	1.8 U	46 UJ	1.8 U	1.8 U	1.8 U
Trichloroethene	4.3	21	30	88	1.0 J	54 U	1.6 J	**2000[abcd]**	**40[abc]**
Trichlorofluoromethane (CFC-11)	-	7300	-	31000	8.8	40 J	74	5.2	5.2
Trifluorotrichloroethane (Freon 113)	-	310000	-	1300000	3.8 U	78 U	3.8 U	3.8 U	3.8 U
Vinyl chloride	1.6	1000	28	4400	0.51 U	52 U	0.51 U	0.51 U	0.51 U
Xylenes (total)	-	1000	-	4400	1.3 U	44 U	13	19	30

Notes:

All concentrations are expressed in units of micrograms per cubic meter ($\mu g/m^3$) unless otherwise noted.
J - The parameter was positively identified; however, the associated parameter concentration is estimated.
ELCR - Excess Lifetime Cancer Risk
HI - Hazard Index
SVSL = Soil Vapor Screening Level.
U - The parameter was not detected. The associated numerical value is the sample quantitation limit.
UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.
The residential soil vapor screening levels (SVSLs) are based on the USEPA 2013 Regional Screening Levels (November 2013) for Residential Air. The RSLs are derived assuming a 10^{-6} target estimated lifetime cancer risk level or a hazard index of 1.
The SVSLs were derived from the USEPA (November 2013) RSLs by applying the USEPA Region 5 Vapor Intrusion Guidebook (Oct 2010) default soil-vapor-to-indoor-air attenuation factor of 0.1.
[w] = An RSL is not available for 1,3-dichlorobenzene; the RSL for 1,4-dichlorobenzene was considered an evaluation surrogate for 1,3-dichlorobenzene.
[x] = An RSL is not available for cis-1,2-dichloroethene; the RSL for trans-1,2-dichloroethene was considered an evaluation surrogate for cis-1,2-dichloroethene.
[y] = An RSL is not available for cis-1,3-dichloropropene; the RSL for 1,3-dichloropropene was considered an evaluation surrogate for cis-1,3-dichloropropene.
[z] = An RSL is not available for trans-1,3-dichloropropene; the RSL for 1,3-dichloropropene was considered an evaluation surrogate for trans-1,3-dichloropropene.

TABLE 2.5

HISTORIC SOIL VAPOR FIELD PARAMETERS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Sample Location:	*GP06-09*	*GP06-09*	*GP06-09*	*GP06-09*	*GP06-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP08-09*	*GP08-09*	*GP08-09*	*GP08-09*
Sample ID:	*GP06-09*	*GP06-09*	*GP06-09*	*GP06-09*	*GP06-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP08-09*	*GP08-09*	*GP08-09*	*GP08-09*
Sample Date:	*9/18/2009*	*10/14/2009*	*12/9/2009*	*11/1/2012*	*1/10/2013*	*9/18/2009*	*10/14/2009*	*12/9/2009*	*11/1/2012*	*1/10/2013*	*9/18/2009*	*10/14/2009*	*12/9/2009*	*11/1/2012*
Parameter														
Field Parameters														
Methane	0.1	0	0	0 / 0	0 / 0	0	0	0	0 / 0	0 / 0	0	0	0	0 / 0.1
Carbon Dioxide (%)	8.2	6.1	2.5	2.4 / 2.1	1.5 / 1.5	13.6	12.8	5.1	6.2 / 6.7	13.7 / 13.8	10.5	9.1	3.9	0 / 0.4
Oxygen (%)	--	10.1	16	19.1 / 19.5	19.3 / 19.0	--	4.4	13.9	13.1 / 12.8	4.7 / 5.0	--	7.8	16	21.9 / 21.6
Lower Explosive Limit (%)	--	0	0	0 / 0	0 / 0	--	0	0	0 / 0	0 / 0	--	0	0	0 / 2
Manometer Pressure (inches H_2O)	--	0	-1.1	0.8	0	--	0	0	2.81	2.41	--	0	0	0.8
PID (ppm)	--	0	0	--	--	--	0	0	--	--	--	0	0	--
Barometric Pressure (in. Hg)	29.28	29.27	28.58	--	--	29.28	29.27	28.58	--	--	29.28	29.27	28.58	--
Balance (%)	--	83.8	81.5	78.5 / 78.4	79.2 / 79.5	--	82.9	81	80.7 / 80.5	81.6 / 81.2	--	83	80.1	78.1 / 77.9
Ambient Air Temperature (^oF)	--	--	35	--	--	--	--	35	--	--	--	--	35	--

Notes:

Bold values exceed 10% of the LEL for methane

Bold and shaded values exceed the LEL for methane (5%)

Bold, shaded, and *italic* values exceed the UEL for methane (15%)

UEL - Upper explosive limit

LEL - Lower explosive limit

19.1 / 19.5 - filtered / unfiltered field reading

- - Not applicable.

TABLE 2.5

HISTORIC SOIL VAPOR FIELD PARAMETERS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Sample Location:	*GP08-09*	*GP09-09*	*GP09-09*	*GP09-09*	*GP09-09*	*GP09-09*	*GP10-09*	*GP10-09*	*GP10-09*	*GP10-09*	*GP10-09*
Sample ID:	*GP08-09*	*GP09-09*	*GP09-09*	*GP09-09*	*GP09-09*	*GP09-09*	*GP10-09*	*GP10-09*	*GP10-09*	*GP10-09*	*GP10-09*
Sample Date:	*1/10/2013*	*9/18/2009*	*10/14/2009*	*12/9/2009*	*11/1/2012*	*1/7/2013*	*9/18/2009*	*10/14/2009*	*12/9/2009*	*11/1/2012*	*1/7/2013*
Parameter											
Field Parameters											
Methane	0 / 0	0.1	0	0	0 / 0	0 / 0	0	0.1	0	0 / 0	0 / 0
Carbon Dioxide (%)	1.5 / 2.1	9.2	8.1	4.4	4.2 / 4.5	4.9 / 4.4	4.4	3.5	2.4	4.0 / 4.3	4.1 / 4.5
Oxygen (%)	21.2 / 20.6	--	12.1	13.5	19.8 / 19.7	16.2 / 16.2	13.5	--	8.3	3.1 / 2.4	0.1 / 0.0
Lower Explosive Limit (%)	0 / 0	--	0	0	0 / 0	0 / 0	0	--	0	0 / 0	0 / 0
Manometer Pressure (inches H_2O)	-0.4	--	0	-0.4	0	0	-0.4	--	-2	5.22	4.42
PID (ppm)	--	--	0	0	--	--	0	--	0	--	--
Barometric Pressure (in. Hg)	--	29.28	29	28.64	--	--	28.64	29.28	28.64	--	--
Balance (%)	77.3 / 77.3	--	79.8	82.1	76 / 75.8	78.9 / 79.4	82.1	--	89.3	92.9 / 93.3	95.8 / 95.5
Ambient Air Temperature (^oF)	--	--	--	35	--	--	35	--	35	--	--

Notes:

Bold values exceed 10% of the LEL for methane

Bold and shaded values exceed the LEL for methane (5%)

Bold, shaded, and *italic* values exceed the UEL for methane (15%)

UEL - Upper explosive limit

LEL - Lower explosive limit

19.1 / 19.5 - filtered / unfiltered field reading

- - Not applicable.

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
1	*State the Problem*			
	i) Problem description	Insufficient soil quality data exist for OU2 in order to determine: - The nature and extent of contaminated soil and fill. - The nature and lateral and vertical extent of the contaminated soil and fill material.	- Insufficient soil quality data exist for OU2 in order to determine whether contaminant concentrations are from historic site activities or are due to elevated background concentrations (either naturally occurring or anthropogenic regional contamination).	If soil or fill containing site-related contaminants of concern (COCs) at concentrations greater than screening values and background reference conditions is found in Phases 1A and 1B for Southern Parcels, there may still be insufficient data to establish the presence or absence of direct contact, ingestion, and inhalation risks to receptors via soil and/or fill exposure pathways.
	ii) Planning team	See note at bottom		
	iii) Conceptual model	Fill was placed in a portion of the Southern Parcels. The fill includes but may not be limited to CDD. The fill may contain contaminants. OU2 soil may have site-related contaminants from wind-blown deposition, run-off, groundwater leaching, and/or redepositing of contamination (i.e. regrading). - Contaminants in soil may pose a risk to human receptors via the direct contact, inhalation and ingestion pathways. Cover material at the Site is limited or non-existent, which could lead to erosional run-off of contaminants towards the Quarry Pond, which may pose a risk to human receptors and ecological receptors (e.g. wildlife, aquatic organisms) - Infiltrating precipitation can cause contaminants in soil and fill to migrate downwards, ultimately impacting groundwater. - Groundwater migrating from OU1 could deposit contaminants in the soil and/or fill of OU2.		
	iv) General intended use for data	The soil and fill data collected will be compared to USEPA Residential and Industrial Soil Regional Screening Levels (RSLs) to identify direct contact/ingestion/inhalation human health risks, and compared to USEPA RCRA Ecological Screening Levels (ESLs) (USEPA, 2003) to identify ecological risks associated with soil and fill in OU2. The data collected will ultimately be used in the Remedial Investigation Report and Baseline Risk Assessment for OU2.	The data collected from sampling locations in the Southern Parcels will be compared to background conditions, to determine if there are measurable levels of Site-related contaminants. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The collected data will be used to generate exposure estimates for an assessment of direct contact/ingestion/inhalation human health risks and risks to ecological receptors. The data collected will ultimately be used in the Baseline Human Health Risk Assessment and Ecological Risk Assessment for OU2.
	v) Resources, constraints, deadlines	Sufficient resources will be committed to sample soil on the Southern Parcels under the OU2 RI/FS work plan. Sampling may be postponed due to flooding.		

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
2	*Goals of the Study:*			
	i) Primary study question	Do soil and fill samples from the Southern Parcels contain contaminants at concentrations greater than Industrial or Residential Soil RSLs, or USEPA RCRA ESLs[1]?	Are contaminant concentrations due to Site activities or locally occurring background concentrations?	Does soil or fill in OU2 contain Site-related contaminants that pose unacceptable human health risks or unacceptable risks to ecological receptors?
	ii) Alternate outcomes or actions	- If sampling demonstrates that contaminant concentrations in soil and fill are less than RSLs, no further sampling or remedial action is planned. - If sampling demonstrates that contaminant concentrations in soils or fill are greater than screening levels/criteria, further evaluation is needed to determine if the contamination is Site-related, and is a risk to human health and the environment, and/or remedial measures.	- If sampling demonstrates that contaminant concentrations in OU2 are not greater than those found in background reference soils, no further sampling is planned. - If statistical analysis indicates that additional sampling is required to obtain the necessary precision and accuracy, additional background samples will be collected.	- If sampling demonstrates that human health and ecological risks from all combined exposure pathways are acceptable, no further action is required. - If sampling demonstrates unacceptable human health or ecological risks, further evaluation, risk management and/or remediation would be required.
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)	Decision (Action Level)	Estimation
	iv.a) Decision statement	Determine whether any Site-related contaminant concentrations in soil and fill are greater than USEPA Industrial/Residential Soil RSLs, or USEPA RCRA ESLs[1] in OU2.	Determine whether any measurable levels of Site-related contaminants, relative to background reference conditions, occur in soil and fill in OU2.	Determine where contaminant concentrations require further consideration or response action, and where no further investigation is necessary.
	iv.b) Estimation statement & assumptions	--	--	The parameter of interest is the mean (for estimating direct contact/ingestion/inhalation risks) of soil/fill contaminant concentrations within identified exposure areas in OU2. The exposure areas are defined in Section 5.2 of the OU2 RI/FS Work Plan. The statistical measure of interest is the 95% UCL of the mean for each exposure unit. The size and location of each exposure unit has been identified based on property ownership boundaries and current and reasonably foreseeable activities and land uses.

[1] Ecological Screening Levels (ESLs) will be presented and defined in the Screening Level Environmental Risk Assessment (SLERA) workplan

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
3	***Identify Information Inputs:***			
	i) Information types needed	- Identification and chemical analysis of soil and fill in OU2. - Contaminant concentrations in soil and fill in OU2. - Background soil contaminant concentrations. - Soil samples will be collected on a random basis (random oriented grid) from each exposure area; however, CRA will ensure that samples are collected from areas where geophysical anomalies have been identified and will adjust the random sample locations as needed to achieve this. - Soil samples will also be collected at data gap locations or areas of suspected soil contamination. - Exposure areas, determined by current and reasonably foreseeable activities land uses, exposure routes, property ownership boundaries and topography.		- Supplemental analyses of soil samples obtained to fill in significant data gaps across the exposure area. - Exposure routes and receptors - Toxicological information on the contaminants of concern.
	ii) Information Sources	- Existing soil/fill data - New results from all soil and fill samples collected from OU2, and data on background conditions. - Conceptual site model.		- New soil/fill data from the Phase 2 investigation - Available validated previous data (e.g., from Phase 1), within the exposure area.
	iii) Basis of Action Level	Action Levels are: - USEPA Industrial and Residential Soil RSLs - USEPA RCRA ESLs The data collected will be compared against USEPA Residential and Industrial Soil RSLs, and ESLs to identify potential human health and ecological risks associated with soil samples from OU2.		--
	iv) Appropriate sampling & analysis methods	Methods are described in the Field Sampling Plan (CRA, May, 2013) and the Quality Assurance Project Plan (CRA, September 2008).		

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* *Investigation Item:*	*Phase 1A* *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* *Comparison to Background Reference Conditions*	*Phase 2* *Additional sampling (if necessary) to develop risk assessment exposure estimates*
4	***Define the Boundaries of the Study:***			
	i) Target population, sample units	The initial target population is surficial and subsurface soils on the Southern Parcels. The sampling units are individual samples.	The sampling units are individual samples collected from the soil off-Site (beyond the Southern Parcels). The initial target population of background samples is surficial and subsurface soils from off-Site, near-by properties that have similar soil conditions to on-Site native soils.	Target population is soil and fill exceeding screening levels and comprising the exposure units for assessment of exposure risks for human receptors.
	ii) Specify spatial boundaries	The spatial boundaries are the limits of site-related soil and fill contamination. Surficial soil is to a maximum depth of 2 ft bgs for human health risk purposes, and 3 ft bgs for ecological risk. The spatial boundaries of the sub-surface soil samples for screening human health risks will be to a depth of 15 ft bgs, i.e., the maximum soil depth construction workers would be expected to encounter. There is no predetermined maximum depth for characterizing the extent and magnitude of contamination. [Per the groundwater DQO in Table 3.2, additional unsaturated soil samples will be collected at depths greater than 15 ft bgs to investigate potential leaching threats to groundwater.] Boreholes will be advanced a minimum of 5 ft into native material or until refusal, whichever is encountered first.	Background reference surface and subsurface sampling locations will be identified in areas outside a reasonable zone of potential influence (via surface runoff or substantial airborne dust deposition) for the Site. Distance from the Site and prevailing wind directions will be considered in making this determination.	The spatial boundaries are the limits of OU2, which is everywhere that environmental media have been impacted by Site contaminants outside of OU1. Surficial soil is to a maximum depth of 2 ft bgs for human health risk purposes, and 3 ft bgs for ecological risk. The spatial boundaries of the sub-surface soil samples for screening human health risks will be to a maximum depth of 15 ft bgs, i.e., the maximum soil depth construction workers would be expected to encounter. [Per the groundwater DQO in Table 3.2, the spatial boundaries to evaluate risks to groundwater will be the entire depth of soil above the water table.]
	iii) Specify temporal boundaries	The temporal boundaries are indefinite, assuming continued exposure at levels found during sampling. The practical temporal limits are based on the exposure assumptions of the Action Levels.		

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* *Investigation Item:*	*Phase 1A* *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* *Comparison to Background Reference Conditions*	*Phase 2* *Additional sampling (if necessary) to develop risk assessment exposure estimates*
	iv) Identify any other practical constraints	Practical constraints anticipated for sampling of OU2 soil and fill include the presence of cars on the Jim City Parcels and buildings and equipment on the Ron Barnett Parcels. Safety issues associated with sampling adjacent to surface water will also be considered for sampling activities on the Quarry Pond Parcels.	If different surficial soil substrates are encountered (e.g., silt vs. sand vs. clay), these differences may require additional sampling (e.g., further reference samples) to appropriately evaluate potential Site-related impacts. Off-Site sampling may be restricted by permission of property owners, and availability of suitable locations for background locations.	Practical constraints anticipated for sampling of Southern Parcels soil include the presence of cars on the Jim City Parcels and buildings and equipment on the Ron Barnett Parcels. Off-Site sampling, if required for delineation purposes, may be restricted by permission of property owners.
	v.a) Scale of inference for decision making	Comparisons to Action Levels will be carried out on an individual-location basis.	Comparisons to background reference conditions will be carried out on an individual-location basis.	--
	v.b) Scale of estimates			The scale of the exposure estimate is to be identified in a Site-specific risk assessment.

5 ***Develop the Analytic Approach:***

i.a) Specify Action Level	1) USEPA Industrial Soil RSLs 2) USEPA Residential Soil RSLs 3) USEPA RCRA ESLs	Background Threshold Values based on background reference data, following USEPA's ProUCL Technical Guide (2013)	--
i.b) Specify estimator	--		The arithmetic mean (per USEPA RAGS requirements) surface soil concentration of each contaminant that is greater than screening criteria.

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* *Investigation Item:*	*Phase 1A* *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* *Comparison to Background Reference Conditions*	*Phase 2* *Additional sampling (if necessary) to develop risk assessment exposure estimates*
	ii.a) Specify population parameter of interest and theoretical decision rule	Individual observations at sampling locations on the Southern Parcels.		--
	ii.b) Specify estimation procedure	--		The study will estimate the mean concentration of the exposure unit population represented by the soil samples obtained.
6	***Specify Performance or Acceptance Criteria:***			
	i.a) Set baseline (null) and alternative hypotheses	Baseline H_0: soil sample concentrations are less than Action Levels. Alternative H_1: soil samples contain contaminant concentrations greater than Action Levels.	Baseline H_0: soil sample concentrations from the Southern Parcels are no different than reference background concentrations Alternative H_1: soil samples from the Southern Parcels contain contaminants at concentrations greater than reference conditions.	--
	i.b) Specify how uncertainty accounted for in estimate	--		Uncertainty will be accounted for using a confidence interval on the population mean (per USEPA RAGS guidance).

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* *Investigation Item:*	*Phase 1A* *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* *Comparison to Background Reference Conditions*	*Phase 2* *Additional sampling (if necessary) to develop risk assessment exposure estimates*
	ii.a) Determine impact of decision errors (false positives/negatives)	N/A: no statistical test is employed (direct / individual point-based comparison to Action Levels)	- If a false positive (Type I) error occurs, unnecessary additional investigation (Phase 2) may occur. - If a false negative (Type II) error occurs, conditions that are not due to background contaminant concentrations and pose potential health risks to receptors persist.	--
	ii.b) Specify confidence level for estimate	--		The confidence level of the estimate will be 95 percent, unless specified otherwise (based on data distribution and/or the presence of non-detect results) in USEPA's ProUCL Technical Guide (2013).
	iii) Specify "gray region" for test	N/A: no statistical test is employed (direct / individual point-based comparison to Action Levels)	N/A: since comparing individual concentrations against reference conditions, no statistical test is employed.	--
	iv.a) Set tolerable limits on decision errors	N/A: no statistical test is employed (direct / individual point-based comparison to Action Levels)	The Background Threshold Values will be calculated using a 95 percent confidence level, making the false positive rate no greater than 5 percent. Limits on the false negative rate are not appropriate for comparisons of individual results to threshold values.	--
	iv.b) Specify performance or acceptance criteria	--		The lesser value of the 95 percent UCL on the population mean or the maximum individual measurement will be required.

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* *Investigation Item:*	*Phase 1A* *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* *Comparison to Background Reference Conditions*	*Phase 2* *Additional sampling (if necessary) to develop risk assessment exposure estimates*
7	***Develop the Plan for Obtaining Data:***			
	i) Select sampling design	Soil samples from Southern Parcels will be collected from the exposure areas. Exposure areas are determined based on current use and ownership, potential future use, and topography. The exposure areas are defined in Section 5.2 of the OU2 RI/FS Work Plan.	Background surface and subsurface reference samples will be collected at 10 locations to provide a suitable data set (per USEPA's ProUCL Technical Guide, 2013) for the calculation of Background Threshold Values.	The number of additional soil samples required, for delineation purposes and removal of data gaps, will be determined based on the results of the Phase 1A and 1B investigations.
		Separate sets of data will be collected for (i) surface soil 0-2', (ii) subsurface soil 2-15', and (iii) unsaturated samples from a minimum of 24 locations at depths greater than 15 ft bgs. Additional soil samples will be collected at intervals within boreholes exhibiting evidence of contamination (based on field screening, visual and olfactory observations) A minimum of 8 samples per exposure area, per USEPA's ProUCL Technical Guide (2013), spaced on a regular grid with random origin (i.e., a systematic random sampling design), will be obtained for each exposure area identified in the risk assessment. Additional samples will be collected in the areas of any data gaps. Additional samples will be collected from subsurface soil (>15' at 3 locations per exposure area and additional locations) if impacts are identified.	--	--

TABLE 3.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS SOIL AND FILL
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* *Investigation Item:*	*Phase 1A* *Comparison to Residential and Industrial Soil Criteria*	*Phase 1B* *Comparison to Background Reference Conditions*	*Phase 2* *Additional sampling (if necessary) to develop risk assessment exposure estimates*
	ii) Specify/evaluate key assumptions supporting the design	The calculation of 95 percent upper confidence limits on a population mean makes assumptions of data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.	The calculation of Background Threshold Values (statistical limits on an upper percentile, e.g. 95th) for the reference population of surficial soils depends on data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.	The calculation of 95 percent upper confidence limits on a population mean makes assumptions of data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.

Notes:

[1] If investigating a "decision problem", follow items ending in ".a" in subsequent DQO steps (e.g., "ii.a" or "iii.a").
If investigating an "estimation problem", follow ".b" items.
Once the baseline risk assessment for OU2 has been performed, possible remedial goals (PRGs) will be derived from the calculator using site-specific risks.

-- Item not applicable for the type of problem (decision vs. estimation) investigated.

The planning team includes:
Respondents: Ken Brown (ITW); Jim Campbell (ITW); Bryan Heath (NCR); Wendell Barner (TRW)
Steve Quigley (CRA Project Director); Adam Loney (CRA project manager);
Wesley Dyck, Daniela Araujo (CRA statistics expert);
April Gowing, Steve Harris, Vincent Nero and Dan Smith (CRA risk assessment experts);
Paul Wiseman, Rawa Fleisher, Angela Bown (CRA chemists/quality assurance staff);
Julian Hayward, Valerie Chan (CRA project engineers); Mark Hilverda (CRA project hydrogeologist);
Leslie Patterson (USEPA Regional Project Manager); Maddie Smith (Ohio EPA representative); and property owner stakeholders.

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
1	*State the Problem*			
	i) Problem description	Insufficient soil/fill quality data exist for OU2 in order to determine the presence or absence of risks to groundwater from contaminated soil or fill.	Insufficient groundwater quality data exist for OU2 in order to determine whether potential groundwater contamination is from the Site or from off-Site sources.	If soil/fill samples contain Site-related contaminant concentrations greater than USEPA SSL criteria for the protection of groundwater or Ohio EPA leach-based soil values, or if groundwater samples collected in the current (2013-2014) Phase 2A/B groundwater investigation contain Site-related contaminant concentrations greater than USEPA Maximum Contaminant Levels (MCLs) or Tapwater Regional Screening Level (RSL) criteria, a groundwater investigation will be conducted to delineate areas of OU2 groundwater contamination.
	ii) Planning team	See note at bottom		
	iii) Conceptual model	- Fill and/or contaminated soils above or below the water table may act as a source for groundwater contamination due to leaching and infiltration (Phase 1). Contaminated groundwater related to Site-activities may have migrated outside the boundaries of OU1. Shallow groundwater in the Upper Aquifer Zone typically flows westward and northward across the Site towards the Great Miami River (GMR), with a southwesterly component of flow oriented towards the Quarry Pond. Depending on the surface water elevation, it is apparent that groundwater in the Upper Aquifer Zone both discharges to, and is recharged by, the GMR. Thus, groundwater could transport contaminants to surface water. Groundwater flow in the Lower Aquifer Zone is predominantly southwest across the Site, with an occasional slight component of flow southeast towards monitoring wells MW-210B and MW-214. The Lower Aquifer Zone is a designated sole-source aquifer. - VOCs, such as TCE, may volatilize from groundwater into vadose zone soil gas, which may migrate to indoor air via foundation cracks and utility penetrations in buildings, or may discharge to ambient air via dispersion (Phase 2). - The leachate seep investigation was completed over two days in September 2008. Field staff monitored the Site for the presence of leachate seeps through 2008 and 2009. No leachate seeps were observed during that time. Should leachate be observed during OU2 investigations, leachate seep sampling will be completed in accordance with the Leachate Seep Letter Work Plan (CRA, May 6, 2008).		
	iv) General intended use for data	The soil data collected from each borehole will be used to identify areas in OU2 that may contribute to groundwater contamination. The data collected will be compared against Ohio EPA leach-based soil values and USEPA screening levels in soil (SSLs) that are protective of groundwater to identify risks associated with soil in OU2.		The OU1 Phase 2A/B data and any previously generated and validated data (historic monitoring wells and vertical aquifer samples (VAS)) will be used to determine the extent and magnitude of groundwater contamination above action levels, and generate exposure estimates for an assessment of ingestion, dermal contact, and inhalation of groundwater contaminants. The data will also be used to determine risks of groundwater contaminant volatilization into vadose zone soil gas, which may migrate to indoor air or discharge to ambient air. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.
	v) Resources, constraints, deadlines	Sufficient resources will be committed to sample soil, groundwater, and leachate and seeps (if present) on the Southern Parcels and beyond (if necessary) under the OU2 RI/FS work plan. Sampling may be postponed due to flooding.		

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
2	*Goals of the Study:*			
	i) Primary study question	Do soil samples from soil borings in OU2 contain Site-related contaminants at concentrations greater than Ohio EPA leach-based soil values or USEPA SSLs?		What is the extent of groundwater with Site-related contaminants exceeding USEPA MCLs, Tapwater RSLs, or USEPA Vapor Intrusion Screening Levels (VISLs)?
	ii) Alternate outcomes or actions	- If sampling demonstrates that contaminant concentrations in soil are less than screening levels/criteria for leaching to groundwater, these potential migration pathways can be eliminated in the CSM for this area. - If soil samples collected from the boreholes demonstrate that contaminant concentrations in soils are greater than screening levels/criteria, and greater than background reference conditions, groundwater investigative activities may be warranted to identify and if necessary delineate groundwater plumes and/or fully characterize risks to human health.		- If sampling demonstrates that human health risks are acceptable, no further action is required. - If sampling demonstrates the presence of a Site-related groundwater contaminant plume, further study may be needed to evaluate alternatives for groundwater restoration. - If sampling demonstrates unacceptable human health risks, further evaluation, risk management and/or remediation would be required.
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)		Decision (Action Level)
	iv.a) Decision statement	Determine whether contaminant concentrations in the soil borings are greater than USEPA SSLs or Ohio EPA leach-based soil values.		Determine whether groundwater in OU2 with Site-related contamination poses an unacceptable ingestion, dermal contact, or inhalation risks to human health.
	iv.b) Estimation statement & assumptions	--		--

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
3	***Identify Information Inputs:***			
	i) Information types needed	- Soil sample analysis from OU2 - Soil samples will be collected on a random basis (random oriented grid) across OU2. - Soil samples will also be collected at data gap locations (i.e., remaining geophysical anomalies) or areas of suspected soil contamination.	- Soil sample analysis from background locations	- Existing and newly-collected groundwater data from OU2.
	ii) Information Sources	- Newly-collected and existing data from OU2	- Newly-collected and existing data from background locations.	- Newly-collected and validated data - Any available previous validated data (e.g., from historic monitoring wells and VAS samples) from OU2.
	iii) Basis of Action Level	- Action Levels are: - USEPA SSLs - Ohio EPA leach-based soil values		Action levels are: - USEPA MCLs, and RSLs for Tap Water where MCLs are unavailable - USEPA and/or ODH VISLs for groundwater
	iv) Appropriate sampling & analysis methods	Methods are described in the Field Sampling Plan (CRA, May, 2013) and the Quality Assurance Project Plan (CRA, September 2008).		

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
4	***Define the Boundaries of the Study:***			
	i) Target population, sample units	- The target population is soil on the Southern Parcels, to be extended to soils elsewhere in OU2 if the extent of contamination above screening levels cannot be delineated in the Southern Parcels alone. The sampling units are individual samples collected from the soil.	- The target population is soil outside of OU1 and the Southern Parcels that are expected to represent background contaminant levels. The sampling units are individual samples collected from the soil.	Target population is groundwater within the Southern Parcels. If a Site-related groundwater plume extends beyond the Southern Parcels, additional sampling to delineate the plume will be necessary. Sampling units are individual groundwater samples collected from monitoring wells.
	ii) Specify spatial boundaries	The spatial boundaries are the limits of Site-related contamination above screening levels. Additional unsaturated soil samples will be collected at depths greater than 15 ft bgs. Boreholes will be advanced through the entire thickness of fill material and up to approximately 5 feet into the underlying native material, or to 15 feet below ground surface (ft bgs), whichever occurs last.		The spatial boundaries are defined by the extent of Site-related groundwater contamination in OU2.
	iii) Specify temporal boundaries	The temporal boundaries are indefinite, assuming continued exposure at levels found during sampling. The practical temporal limits are based on the exposure assumptions of the Action Levels.		- Permanent monitoring wells can be installed at any time based on the results of the soil/fill investigation. - Two sampling events total will be carried out at newly installed monitoring wells, during periods of high (i.e. February - April) or low (i.e., June - September) groundwater elevations. Seasonal groundwater flow fluctuations will be evaluated based on historic Site data, and will be demonstrated by the completion of a Site-wide groundwater elevation monitoring round completed prior to each sampling event.
	iv) Identify any other practical constraints	- Practical constraints anticipated for sampling of Southern Parcel soil include the presence of cars on the Jim City Parcels and buildings and equipment on the Ron Barnett Parcels. - Safety issues associated with sampling adjacent to surface water will also be considered for sampling activities on the Quarry Pond Parcels.		
	v.a) Scale of inference for decision making	Comparisons to Action Levels and background levels will be carried out on an individual-location basis.		
	v.b) Scale of estimates	--		--
5	***Develop the Analytic Approach:***			

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
	i.a) Specify Action Level	- Action Levels are: - USEPA SSLs - Ohio EPA leach-based soil values		Action levels are: - USEPA MCLs, and RSLs for Tap Water where MCLs are unavailable - USEPA and/or ODH VISLs for groundwater
	i.b) Specify estimator	--		--
	ii.a) Specify population parameter of interest and theoretical decision rule	Individual observations at sampling locations on the Southern Parcels, to be extended to soils elsewhere in OU2 if the extent of contamination above screening levels cannot be delineated in the Southern Parcels alone.		
	ii.b) Specify estimation procedure	--		--
6	***Specify Performance or Acceptance Criteria:***			
	i.a) Set baseline (null) and alternative hypotheses	Baseline H_0: soil sample concentrations are less than Action Levels Alternative H_1: soil samples contain contaminant concentrations greater than Action Levels		Baseline H_0: groundwater sample concentrations are less than Action Levels or are consistent with upgradient conditions (i.e., source is upgradient, either on or off-Site) Alternative H_1: groundwater sample concentrations are greater than Action Levels or upgradient conditions (i.e., contamination is related to Southern Site Parcels in OU2).
	i.b) Specify how uncertainty accounted for in estimate	--		--
	ii.a) Determine impact of decision errors (false positives/negatives)	N/A: no statistical test is employed (direct comparison to Action Levels)		N/A: no statistical test is employed (direct comparison to Action Levels)

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
	ii.b) Specify confidence level for estimate	--		--
	iii) Specify "gray region" for test	N/A: no statistical test is employed (direct comparison to Action Levels)		
	iv.a) Set tolerable limits on decision errors	N/A: no statistical test is employed (direct comparison to Action Levels)		
	iv.b) Specify performance or acceptance criteria	--		--

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Investigation of Soil/Fill on Southern Parcels*	*Phase 1B* / *Comparison of Soil to Background*	*Phase 2* / *Groundwater Investigation (See OU1 Phase 2A/B DQO)*
7	***Develop the Plan for Obtaining Data:***			
	i) Select sampling design	- Soil samples from Southern Parcels will be collected from each exposure area - Exposure areas are determined based on current use and ownership, potential future use, and topography. Exposure areas are detailed in Section 5.2 of the OU2 RI/FS Work Plan. - Separate sets of data will be collected for (i) surface soil 0-2', (ii) subsurface soil 2-15', and (iii) unsaturated samples from a minimum of 24 locations at depths greater than 15 ft bgs. - Additional soil samples will be collected at intervals within boreholes exhibiting evidence of contamination (based on field screening, visual and olfactory observations) - A minimum of 8 samples per exposure area, per USEPA's ProUCL Technical Guide (2013), spaced on a regular grid with random origin (i.e., a systematic random sampling design), will be obtained for each exposure area identified in the risk assessment. Additional samples will be collected in the areas of any data gaps (i.e. remaining geophysical anomalies). Additional samples will be collected from subsurface soil (>15' at 3 locations per exposure area, and additional locations if impacts are identified).	- Groundwater samples from Southern Parcels will be collected from exposure areas with soil/fill concentrations greater than USEPA SSL criteria for the protection of groundwater or Ohio EPA leach-based soil values, or groundwater concentrations greater than USEPA RSLs from samples collected in the proposed (2014) Phase 1B/2A groundwater investigation - Exposure areas are determined based on current use and ownership, potential future use, and topography. Exposure areas are detailed in Section 5.2 of the OU2 RI/FS Work Plan - Monitoring wells will be installed at select locations identified as areas of potentially unacceptable risks or areas of significantly elevated contaminant concentrations. Respondents will discuss Phase 1 data, and all previous data with USEPA to determine the next steps and suitable locations of permanent monitoring wells. - Two sampling events will be carried out at newly installed monitoring wells. Parameters included in the second round of analysis may be decreased depending on the results of the first round. ex	
	ii) Specify/evaluate key assumptions supporting the design	The calculation of 95 percent upper confidence limits on a population mean makes assumptions of data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.		

TABLE 3.2

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – GROUNDWATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 2*
DQO Step	*Investigation Item:*	*Investigation of Soil/Fill on Southern Parcels*	*Comparison of Soil to Background*	*Groundwater Investigation (See OU1 Phase 2A/B DQO)*

Notes:

[1] If investigating a "decision problem", follow items ending in ".a" in subsequent DQO steps (e.g., "ii.a" or "iii.a").
If investigating an "estimation problem", follow ".b" items.
Once the baseline risk assessment for OU2 has been performed, possible remedial goals (PRGs) will be derived from the calculator using site-specific risks.

-- Item not applicable for the type of problem (decision vs. estimation) investigated.

The planning team includes:
Respondents: Ken Brown (ITW); Jim Campbell (ITW); Bryan Heath (NCR); Wendell Barner (TRW)
Steve Quigley (CRA Project Director); Adam Loney (CRA project manager);
Wesley Dyck, Daniela Araujo (CRA statistics expert);
April Gowing, Steve Harris, Vincent Nero and Dan Smith (CRA risk assessment experts);
Paul Wiseman, Rawa Fleisher, Angela Bown (CRA chemists/quality assurance staff);
Julian Hayward, Valerie Chan (CRA project engineers); Mark Hilverda (CRA project hydrogeologist);
Leslie Patterson (USEPA Regional Project Manager); Maddie Smith (Ohio EPA representative); and property owner stakeholders.

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1* / *Investigation of Soil, Fill, and Groundwater on Southern Parcels*	*Phase 2* / *Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)*
1	***State the Problem***		
	i) Problem description	- The OU2 Southern Site Parcel soil and fill areas have not been fully characterized, and they may contain materials that can produce elevated concentrations of explosive gases and NMOCs in landfill gas, and VOCs in soil gas. - Businesses operating on Site are located above or immediately adjacent to fill material, in close proximity to the soil gas probe locations where elevated levels of VOCs and explosive gases were detected. - A data gap exists with respect to possible groundwater contamination outside of OU1 that may have concentrations capable of posing a vapor intrusion threat. - A data gap exists with respect to potential soil contamination that may pose a vapor intrusion threat to businesses operating on or near the Southern Parcels.	- If soil, fill, or groundwater samples containing Site-related contaminant concentrations with the potential to produce landfill gas/soil vapor are identified, actual soil gas concentrations will be investigated through the installation of soil gas probes in the affected area to assess the present conditions and potential for migration.
	ii) Planning team	See note at bottom	
	iii) Conceptual model	- VOCs, such as TCE, may volatilize from groundwater, soil, or subsurface landfill contents into vadose zone soil gas, which may migrate to indoor air via foundation cracks and utility penetrations in buildings. - Workers or residents in buildings where VOCs are present at concentrations greater than target criteria may be subject to potential risks due to inhalation hazards. - Potential future users of the Site include workers both outdoors and in buildings on areas of the Site that are currently vacant.	
	iv) General intended use for data	The collected soil/fill and groundwater data will be used to evaluate the potential for soil, fill, or groundwater contamination to act as a source for landfill gas/soil vapor, and to identify areas with potential landfill gas/soil vapor impacts.	The collected soil gas data will be used for direct comparison to the action levels, and each result will represent a reasonable worst-case maximum potential concentration migrating to indoor air at each structure. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.
	v) Resources, constraints, deadlines	An iterative sampling approach may be required to refine estimates based on earlier findings from the OU1 vapor intrusion investigation.	Sufficient resources have been reserved to collect and analyze soil gas from the probes. Sampling may be constrained by access agreements to off-Site parcels or buildings. An iterative sampling approach may be required to refine estimates based on findings from the soil, fill, and groundwater investigations.

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Investigation Phase:	*Phase 1*	*Phase 2*
DQO Step	*Investigation Item:*	*Investigation of Soil, Fill, and Groundwater on Southern Parcels*	*Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)*
2	*Goals of the Study:*		
	i) Primary study question	Does OU2 soil, fill, or groundwater contain Site-related contaminant concentrations that indicate VOCs or methane in soil gas may pose a threat to human health?	- Do contaminant concentrations in soil vapor pose an unacceptable risk, via the vapor intrusion pathway, to occupants of structures on or immediately adjacent to the Site? - Are concentrations of combustible gases within a structure greater than the screening criteria of 1 and 10 percent of the LEL (as per the USEPA Region V Vapor Intrusion Guidebook, October 2010), or the regulatory criterion of 25 percent of the LEL (as per OAC Chapter 3745-27-12)? - Taken together, how do the concentrations of contaminants and combustible gases in soil vapor affect future use of the Site? - Does the OU2 soil vapor act as a source of soil gas to the structures studied in the Vapor Intrusion investigation?
	ii) Alternate outcomes or actions	- If soil/fill borehole samples and/or groundwater samples contain VOCs at concentrations less than the action levels, and methane below 1 and 10 percent of the LEL, no further action is necessary. - If VOCs and/or methane are present at concentrations greater than the action levels and 1 and 10 percent of the LEL, then further evaluation is required.	- If soil gas samples contain VOCs at concentrations less than the action levels, and methane below 1 and 10 percent of the LEL, no further action is necessary. - If VOCs and/or methane are present at concentrations greater than the action levels and 1 and 10 percent of the LEL, then further evaluation is required.
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)	Decision (Action Level)
	iv.a) Decision statement	Determine whether VOCs are present in OU2 soil/fill material and groundwater at levels posing a potential risk to occupants of current and future on-Site structures.	Determine whether VOCs are present in the OU2 areas at levels posing a potential risk to potential current and future occupants of off-Site structures identified as being at risk from volatilization of groundwater into indoor air based on the OU2 soil investigation and Phase 2 of the Groundwater DQO investigation.
	iv.b) Estimation statement & assumptions	--	--

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1* / *Investigation of Soil, Fill, and Groundwater on Southern Parcels*	*Phase 2* / *Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)*
3	***Identify Information Inputs:***		
	i) Information types needed	- Analytical data from soil boreholes installed within the soil and fill material, and monitoring well groundwater samples.	- This would be a new data collection effort, with analyses performed on samples collected from soil gas probes installed within the soil and/or fill material.
	ii) Information Sources	- New data from the OU2 soil and groundwater investigations will form the basis of assessment.	- New data from the OU2 soil vapor/landfill gas investigation will form the basis of assessment.
	iii) Basis of Action Level	Action Levels are: - Ohio Department of Health (ODH) Industrial and Residential Action Levels - USEPA Vapor Intrusion Screening Levels (VISLs: groundwater, indoor air, and sub-slab soil vapor levels calculated from USEPA RSLs and ODH screening levels for air inhalation). - 1, 10, or 25 percent of the LEL	
	iv) Appropriate sampling & analysis methods	- Methods are described in the Field Sampling Plan (CRA, May, 2013) and the Quality Assurance Project Plan (CRA, September 2008). - During the soil borehole investigation, methane values will be recorded in the field using a Landtec GEM-2000, or equivalent equipped with a charcoal carbon filter to differentiate methane from VOCs.	- Methods are described in the Vapor Intrusion Investigation Work Plan (USEPA, November 2011) and Field Sampling Plan (CRA, May, 2013). - VOC and naphthalene analysis is via EPA method TO-15. - During soil gas probe installation, methane values will be recorded in the field using a Landtec GEM-2000, or equivalent.

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Investigation Phase:	*Phase 1*	*Phase 2*
DQO Step	*Investigation Item:*	*Investigation of Soil, Fill, and Groundwater on Southern Parcels*	*Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)*
4	*Define the Boundaries of the Study:*		
	i) Target population, sample units	The target population is surficial and subsurface soils and fill, and groundwater on the Southern Parcels (and beyond the Southern Parcels, if necessary). The sampling units are individual samples collected from the soil, divided into background reference, and exposure units for assessment of risks to human receptors.	Target population is soil gas within the soils and/or the fill area where potential VOC-containing residues are present in the vadose zone, or concentrations of VOCs in groundwater are greater than Phase 1 action levels, and therefore, represent a vapor intrusion risk.
	ii) Specify spatial boundaries	Spatial boundaries are initially the limits of the Southern Parcels within the OU2 boundary, which included the fill area and occupied buildings.	Spatial boundaries are (initially) the limits of the Southern Parcels within the OU2 boundary, which includes the fill area and occupied buildings, where VOC residues are present in the vadose zone or concentrations of contaminants in groundwater are greater than Phase 1 Action Levels. If soil vapor/landfill gas migration beyond the Southern Parcels is indicated by either Phase 1 or Phase 2 sampling, additional soil probes outside of the Southern Parcels will be necessary.
	iii) Specify temporal boundaries	The temporal boundaries are indefinite, assuming continued exposure at levels found during sampling. The practical temporal limits are based on exposure assumptions used in the derivation of the Action Levels.	
	iv) Identify any other practical constraints	- Practical constraints anticipated for sampling of Southern Parcel soil and fill include the presence of cars on the Jim City Parcels and buildings and equipment on the Ron Barnett Parcels. - Safety issues associated with sampling adjacent to surface water will also be considered for sampling activities on the Quarry Pond Parcels.	- Practical constraints anticipated for sampling of Southern Parcel soil gas include the presence of cars on the Jim City Parcels and buildings and equipment on the Ron Barnett Parcels. - Safety issues associated with sampling adjacent to surface water will also be considered for sampling activities on the Quarry Pond Parcels. - Depending on soil borehole sample analytical results, the soil gas probe may not be able to be screened in intervals that delineate the specific stratigraphic layer(s) contributing to combustible gas concentrations.
	v.a) Scale of inference for decision making	The initial decision unit is the soil, fill, and groundwater within the Southern Parcels. The decision unit may be expanded to soil, fill, and groundwater beyond the Southern Parcels, if necessary.	The initial decision unit is the soil gas within the Southern Parcels. The decision unit may be expanded to soil gas beyond the Southern Parcels, if necessary.
	v.b) Scale of estimates	--	

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1* / *Investigation of Soil, Fill, and Groundwater on Southern Parcels*	*Phase 2* / *Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)*
5	***Develop the Analytic Approach:***		
	i.a) Specify Action Level	1) USEPA Industrial Soil RSLs for Inhalation Screening Levels 2) USEPA Residential Soil RSLs for Inhalation Screening Levels	1) ODH Industrial and Residential Action Levels 2) USEPA Vapor Intrusion Screening Levels (VISLs: groundwater, indoor air, and sub-slab soil vapor levels calculated from USEPA RSLs for air inhalation). 3) 1 and 10 percent of the LEL 4) 25 percent of the LEL
	i.b) Specify estimator	--	
	ii.a) Specify population parameter of interest and theoretical decision rule	Individual observations at sampling locations on the Southern Parcels	Maximum concentration in soil gas samples and explosive gas measurements at each structure compared directly to criteria.
	ii.b) Specify estimation procedure	--	
6	***Specify Performance or Acceptance Criteria:***		
	i.a) Set baseline (null) and alternative hypotheses	Baseline H_0: soil or groundwater contamination concentrations are less than Action Levels Alternative H_1: soil or groundwater contamination concentrations are greater than Action Levels	Baseline H_0: soil vapor contamination concentrations are less than Action Levels Alternative H_1: soil vapor contamination concentrations are greater than Action Levels
	i.b) Specify how uncertainty accounted for in estimate	--	
	ii.a) Determine impact of decision errors (false positives/negatives)	N/A: since comparing to maximum value, no statistical test is employed	
	ii.b) Specify confidence level for estimate	--	

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1* / *Investigation of Soil, Fill, and Groundwater on Southern Parcels*	*Phase 2* / *Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)*
	iii) Specify "gray region" for test	N/A: since comparing to maximum value, no statistical test is employed	
	iv.a) Set tolerable limits on decision errors	N/A: since comparing to maximum value, no statistical test is employed	
	iv.b) Specify performance or acceptance criteria	--	
7	***Develop the Plan for Obtaining Data:***		
	i) Select sampling design	See Step 7i) of Tables 3.1 and 3.2	- CRA will install temporary soil gas probes at select locations dependent on the observations CRA makes during the drilling of the soil borings - CRA will assess the need for further soil gas or vapor intrusion monitoring within or beyond the fill material limits, based on the results of the initial monitoring.
	ii) Specify/evaluate key assumptions supporting the design	--	

TABLE 3.3

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SOUTHERN PARCELS SOIL GAS INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Investigation Phase:	***Phase 1***	***Phase 2***
DQO Step	***Investigation Item:***	***Investigation of Soil, Fill, and Groundwater on Southern Parcels***	***Soil Gas Probe Investigation based on Southern Parcels Soil, Fill, and Groundwater Investigations (if necessary)***

Notes:

[1] If investigating a "decision problem", follow items ending in ".a" in subsequent DQO steps (e.g., "ii.a" or "iii.a").
If investigating an "estimation problem", follow ".b" items.
Once the baseline risk assessment for OU2 has been performed, possible remedial goals (PRGs) will be derived from the calculator using site-specific risks.

-- Item not applicable for the type of problem (decision vs. estimation) investigated.

The planning team includes:
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Steve Quigley (CRA Project Director); Adam Loney (CRA project manager);
Wesley Dyck, Daniela Araujo (CRA statistics expert);
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Leslie Patterson (USEPA Regional Project Manager); Maddie Smith (Ohio EPA representative); and property owner stakeholders.

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
1	*State the Problem*			
	i) Problem description	Surface water samples have not previously been obtained from the Great Miami River (GMR) as it flows past the Site. It is unknown whether and to what extent the Site has any measurable impact on water quality in the GMR. Intermittent drainage pathways and leachate seeps have not been identified at the Site to date.		Limited historic surface water samples have been obtained from the Quarry Pond. Historic Quarry Pond surface water samples did not contain any VOCs. No other parameters were assessed. The impact of Site contaminants on the Quarry Pond is not known. Intermittent drainage pathways have not been identified at the Site to date.
	ii) Planning team	See note at bottom		
	iii) Conceptual model	- Shallow groundwater from the Site typically flows towards the west and/or north towards the GMR, which could carry contaminants into its surface waters. - Erosion of surface soils from the Site could also carry Site-related contaminants to the GMR, which is at a lower elevation, via overland surface flow. - During flood events, any potential GMR contaminants originating off-Site could affect the Site. - Greater contaminant concentrations may be present at groundwater discharge points into the GMR and this will be investigated through sampling completed along transects. - Persons can come into contact with river water when using the GMR for recreation. - Wildlife and aquatic organisms are in contact with and ingest GMR water.		- Shallow and deep groundwater from the Site typically flows towards the west towards the Quarry Pond, which could carry contaminants into the Quarry Pond. - During flood events, off-Site contaminants could be deposited in the Quarry Pond. - Erosion of surface soils from the Site could also carry Site-related contaminants to the Quarry Pond, which is at a lower elevation, via overland surface flow. - Persons can come into contact with pond water when using the Quarry Pond area for recreation. - Wildlife and aquatic organisms are in contact with and ingest Quarry Pond water.
	iv) General intended use for data	The data collected will be compared against ambient water quality criteria to assess if human or aquatic ecosystem health is potentially impaired. In addition, CRA will visually inspect the bank of the GMR adjacent to the Site for evidence of leachate and/or runoff discharges potentially related to the Site (i.e., erosion rills, iron oxidation, turbidity, etc.). Sample locations will be matched up with Site discharges, if observed. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The data collected from sampling locations along the Site's boundaries will be compared to upstream (background) conditions, to determine if there are any measurable inputs of contaminants from the Site. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The data collected will be compared against ambient water quality criteria to assess if human health or aquatic ecosystem health is potentially impaired. In addition, CRA will visually inspect the Quarry Pond embankments for evidence of leachate and/or runoff discharges (i.e., erosion rills, iron oxidation, turbidity, etc.). Sample locations will be matched up with Site discharges, if observed. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*Surface Water*		
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
	v) Resources, constraints, deadlines	Surface water quality and storm water runoff may be influenced by rainfall events, water temperature and other seasonal effects, which requires monitoring at different times of the year and under different conditions. Surface water sampling may not be possible during high flows. Surface water and storm water runoff sampling may not be possible during ice-cover conditions. Surface water sampling will be completed during low flow periods where contaminants entering via groundwater would present the greatest risks. Storm water runoff sampling will be completed following rainfall events should a significant runoff pathway be identified. Intermittent drainage pathways have not been identified at the Site to date.		
2	*Goals of the Study:*			
	i) Primary study question	Does surface water quality fail to meet ambient water quality criteria for protection of human health (direct contact, ingestion, and ingestion of aquatic organisms), and aquatic organisms?	Does the Site add contaminants to surface water in the GMR as it flows past the Site? If so, to what extent?	Does surface water quality fail to meet ambient water quality criteria for protection of aquatic organisms and human health (trespassers, recreational users and anglers)?
	ii) Alternate outcomes or actions	- If sampling demonstrates that ambient water quality criteria are met, no further monitoring is planned. - If sampling demonstrates that criteria are not met, comparison with background conditions is warranted.	- If sampling demonstrates conditions adjacent to the Site are less than or equal to those found upstream, no further monitoring is planned. - If sampling demonstrates conditions are greater than upstream, and that contaminant concentrations are greater than Action Level criteria (see Phase 1A to left), further evaluation and/or control measures may be warranted.	- If sampling demonstrates that ambient water quality criteria are met, no further monitoring is planned. - If sampling demonstrates that criteria are not met, further evaluation and/or control measures may be warranted.
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)		
	iv.a) Decision statement	Determine whether any contaminants are present at concentration greater than ambient water quality criteria in the GMR as it flows past the Site.	Determine whether any measurable input of contaminants from the Site, relative to upstream conditions, occurs in the GMR as it flows past the Site.	Determine whether any contaminants are greater than ambient water quality criteria in the Quarry Pond.
	iv.b) Estimation statement & assumptions	--		

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
3	***Identify Information Inputs:***			
	i) Information types needed	Surface water sample analysis is required to assess conditions in the GMR as it flows past the Site.		Surface water samples are required to assess conditions in the Quarry Pond.
	ii) Information Sources	New data from the investigation will form the basis of assessment.		New data from the investigation will form the basis of assessment.
	iii) Basis of Action Level	Action Levels are: - Ambient water quality criteria (Ohio drainage basin) - Ohio EPA Aquatic Life and Human Health Tier 1 and II Values - USEPA RSL (tapwater) - USEPA National Recommended Water Quality Criteria for human health for consumption of water + organisms	The selected Action Level is a Background Threshold Value (e.g., 95th percentile) based on upstream conditions.	Action Levels are: - Ambient water quality criteria (Ohio drainage basin) - Ohio EPA Aquatic Life and Human Health Tier 1 and II Values - USEPA RSL (tapwater) - USEPA National Recommended Water Quality Criteria for human health for consumption of water + organisms
	iv) Appropriate sampling & analysis methods	Methods are described in the Field Sampling Plan (CRA, May, 2013), CRA's Standard Operating Procedures, and the Quality Assurance Project Plan (CRA, September 2008). VOC samples will be collected using a peristaltic pump to minimize sample aeration while allowing for sample preservation. All other parameters will be sampled by directly dipping sample containers in the surface water body (GMR or Quarry Pond).		
4	***Define the Boundaries of the Study:***			
	i) Target population, sample units	The target population is all water flowing in the GMR as it flows past the Site. The sampling units are individual grab samples collected from the GMR, divided into upstream and near-Site reaches. The surface water sample locations will be adjusted based on the location of intermittent drainage pathways and GMR discharge points, if any are identified.		The target population is all water in the Quarry Pond. The sampling units are individual grab samples collected from the Quarry Pond. The surface water sample locations will be adjusted based on the location of intermittent drainage pathways and GMR discharge points, if any are identified.

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
ii) Specify spatial boundaries		In order to ensure that any potential contributions from nearby facilities (e.g. former GM-Delphi plant) are accounted for, CRA proposes to specify upstream sampling locations as those occurring to the east of Dryden Road, on the near-Site side of any dams. Near-Site sampling locations are those occurring to the west of Dryden Road (i.e., as surface water flows past the Site), and these will be located on the near (south/east) shore of the GMR. Due to the industrial activity in the area, chemical use and contaminants in the area may have been used by more than one facility. In order to establish whether contamination is or has resulted from Site activities, the background locations have been set close to the Site.		Spatial boundaries are the boundaries of Quarry Pond surface water.
iii) Specify temporal boundaries		The temporal boundaries are defined by the duration of monitoring, which will occur over two sampling rounds		The temporal boundaries are defined by the duration of monitoring, which will occur over two sampling rounds.
iv) Identify any other practical constraints		Sampling may be postponed due to flooding or ice conditions in the GMR. The outfall of the City of Dayton Waste Water Treatment Plant across the river GMR, just south of the downstream limit of the Site, may substantially impact downstream water quality, making any subsequent Site effects difficult to discern. If any dams/weirs are encountered, samples will be collected from the side of the dam closest to the Site (i.e., downstream of any upstream dams, and upstream of any downstream dams). Dilution of contaminants is likely towards the center and far bank of the GMR, and increases with distance downstream of the Site.		Sampling may be postponed due to flooding or iced conditions in the Quarry Pond.
v.a) Scale of inference for decision making		Comparisons to Action Levels will be carried out on an individual-location basis. For the RA, the 95% UCL of the mean concentration in an exposure unit will be used. A single exposure unit will be applied for the GMR.	Comparisons to upstream conditions will be carried out on an individual-location basis.	Comparisons to Action Levels will be carried out on an individual-location basis.
v.b) Scale of estimates		--		

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
5	***Develop the Analytic Approach:***			
	i.a) Specify Action Level	- Ambient Water Quality Criteria - Ohio EPA Aquatic Life and Human Health Tier 1 and II Values - USEPA RSL (tapwater) - USEPA National Recommended Water Quality Criteria for human health for consumption of water + organisms	Background Threshold Values based on upstream data, following USEPA's ProUCL Technical Guide (2013)	- Ambient Water Quality Criteria - Ohio EPA Aquatic Life and Human Health Tier 1 and II Values - USEPA RSL (tapwater) - USEPA National Recommended Water Quality Criteria for human health for consumption of water + organisms
	i.b) Specify estimator	--		
	ii.a) Specify population parameter of interest and theoretical decision rule	Individual observations at near-Site sampling locations.		
	ii.b) Specify estimation procedure	--		
6	***Specify Performance or Acceptance Criteria:***			
	i.a) Set baseline (null) and alternative hypotheses	Baseline H_0: surface water concentrations are less than Action Levels Alternative H_1: surface water concentrations are greater than Action Levels	Baseline H_0: near-Site surface water is no different than upstream Alternative H_1: near-Site surface water contains contaminant concentrations greater than upstream conditions	Baseline H_0: surface water concentrations are less than Action Levels Alternative H_1: surface water contaminant concentrations are greater than Action Levels
	i.b) Specify how uncertainty accounted for in estimate	--		

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
	ii.a) Determine impact of decision errors (false positives/negatives)	N/A: no statistical test is employed (direct comparison to Action Levels)	- If a false positive (Type I) error occurs, unnecessary additional investigation may occur. - If a false negative (Type II) error occurs, conditions that are not due to background conditions and that pose potential risk to aquatic ecosystem and/or human receptors could persist.	N/A: no statistical test is employed (direct comparison to Action Levels)
	ii.b) Specify confidence level for estimate	--		
	iii) Specify "gray region" for test	N/A: no statistical test is employed (direct comparison to Action Levels)	N/A: since comparing to maximum value, no statistical test is employed	N/A: no statistical test is employed (direct comparison to Action Levels)
	iv.a) Set tolerable limits on decision errors	N/A: no statistical test is employed (direct comparison to Action Levels)	The Background Threshold Values will be calculated using a 95 percent confidence level, making the false positive rate no greater than 5 percent. Since individual near-Site samples will be compared against background samples, the false negative rate will be controlled by two sampling events completed over the study period. An assessment of the decision performance curve achieved based on the monitoring data will be undertaken.	N/A: no statistical test is employed (direct comparison to Action Levels)
	iv.b) Specify performance or acceptance criteria	--		

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*
7	***Develop the Plan for Obtaining Data:***			
	i) Select sampling design	Near-Site samples will be collected close to the proximate (south/east) shore of the GMR, at the mid-point of the GMR at the upstream edge of the Site, and on the near-Site side of any dams; and at intervals of 800 ft (12 samples per event). Prior to surface water sample collection, a Site boundary visual inspection will be completed to identify any areas of discharge (i.e., rust stains, eddies, sediment, etc.) Surface water sampling will be completed during periods of GMR low-flow and the two sampling rounds will be completed at least three months apart.	Upstream samples will be collected at different locations, on the near-Site side of any dams, to provide a suitable data set (8-10 samples, per USEPA's ProUCL Technical Guide, 2013) for the calculation of Background Threshold Values. Near-Site samples will be collected along two three-point transects, upstream of the Site. Surface water sampling will be completed during periods of GMR low-flow and the two sampling rounds will be completed at least three months apart.	Prior to surface water sample collection, visual inspection of the Quarry Pond embankment will be completed to identify any areas of discharge (i.e., rust stains, eddies, sediment, etc.). Five samples will be collected at various points within the Quarry Pond in each of two sampling events (10 samples total). Two sampling rounds will be completed at least three months apart.
	ii) Specify/evaluate key assumptions supporting the design	Mixing in the GMR is expected to be reasonably complete over the travel length of the GMR (greater than one mile) adjacent to the Site. Sampling at key locations (upstream edge, mid-Site, upstream of the WWTP, and downstream) will represent the range of ambient conditions in surface water.	The calculation of Background Threshold Values (statistical limits on an upper percentile, e.g. 95th) for the upstream population of surface waters depends on data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.	

TABLE 3.4

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - SURFACE WATER INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:		*Surface Water*	
	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 1C*
DQO Step	*Investigation Item:*	*Comparison to Ambient Water Quality Criteria*	*Comparison to Upstream Conditions*	*Quarry Pond Surface Water Sampling*

Notes:

[1] If investigating a "decision problem", follow items ending in ".a" in subsequent DQO steps (e.g., "ii.a" or "iii.a").
If investigating an "estimation problem", follow ".b" items.
Once the baseline risk assessment for OU2 has been performed, possible remedial goals (PRGs) will be derived from the calculator using site-specific risks.

-- Item not applicable for the type of problem (decision vs. estimation) investigated.

The planning team includes:
Respondents: Ken Brown (ITW); Jim Campbell (ITW); Bryan Heath (NCR); Wendell Barner (TRW)
Steve Quigley (CRA Project Director); Adam Loney (CRA project manager);
Wesley Dyck, Daniela Araujo (CRA statistics expert);
April Gowing, Steve Harris, Vincent Nero and Dan Smith (CRA risk assessment experts);
Paul Wiseman, Rawa Fleisher, Angela Bown (CRA chemists/quality assurance staff);
Julian Hayward, Valerie Chan (CRA project engineers); Mark Hilverda (CRA project hydrogeologist);
Leslie Patterson (USEPA Regional Project Manager); Maddie Smith (Ohio EPA representative); and property owner stakeholders.

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
1	*State the Problem*				
	i) Problem description	It is unknown whether the Site has a measurable impact on sediment quality in the Great Miami River (GMR). Previous GMR sampling found polycyclic aromatic hydrocarbon (PAH) concentrations and some pesticide concentrations greater than conservative Ecological Screening Levels (ESLs), and arsenic and PAH concentrations greater than USEPA Residential Soil RSLs. However, these common contaminants were also found, in similar concentrations, in upstream samples taken by OEPA (1995) in routine sampling of the GMR. Therefore, further data are needed to assess whether downstream concentrations are greater than upstream concentrations and, if so, whether downstream samples pose potential risks to ecological and human receptors.		If contaminant concentrations are greater than sediment benchmarks protective of aquatic life (Phase 1A-GMR), significantly greater than upstream concentrations (Phase 1B-GMR), and are potentially Site-related, a benthic community survey will be completed in accordance with USEPA Rapid Bioassessment Protocols (EPA 841-B-99-002) or OEPA assessment methods.	Previous Quarry Pond sediment sampling found PAH concentrations greater than conservative ESLs, and arsenic and PAH concentrations greater than USEPA Industrial Soil RSLs. Further data are needed to assess the magnitude and extent of Quarry Pond sediment contamination and, whether Quarry Pond sediments pose potential risks to ecological and human health risks.
	ii) Planning team	See note at bottom			
	iii) Conceptual model	- Shallow groundwater from the Site typically flows towards the west and/or north towards the GMR, which could carry contaminants into its sediment. - Contaminants in sediment can be toxic to benthic organisms. - Fish may uptake contaminants in sediments and can be eaten by other fish, birds, and humans.			- Shallow and deep groundwater from the Site typically flows towards the west towards the Quarry Pond, which could carry contaminants into its sediment. - PAH concentrations greater than conservative ESLs, and arsenic and PAH concentrations greater than USEPA Industrial Soil RSLs, have been found in Quarry Pond sediment.
		- Erosion of surface soils from the Site could also carry Site-related contaminants to the GMR and/or the Quarry Pond, which is at a lower elevation, via overland surface flow. - During flood events, off-site contaminants could be deposited on-site. - Contaminants could be toxic to benthic organisms and impact other species in the aquatic ecosystem. - Persons use the GMR and Quarry Pond for recreation, mainly in boats; however, they could come into dermal contact with the sediment. - Persons consume the fish caught in the Quarry Pond.			

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
	iv) General intended use for data	The sediment data collected will be compared against ESLs[1] to assess whether aquatic ecosystem health is potentially impaired. The sediment data will be used to determine if bioaccumulative contaminants are present and to model edible fish concentrations for the HHRA. Additionally, CRA will compare the data to USEPA Industrial Soil RSLs as a screening evaluation to identify potential human health risks. Industrial Soil RSLs are proposed as a surrogate for human exposure risks from sediments, due to the limited exposure frequency in the GMR compared to a residential exposure scenario. Residential Soil RSLs will be used as an initial screening step to account for early-life susceptibility to mutagens for child receptors. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The data collected from sampling locations adjacent to the landfill's boundaries will be compared to upstream conditions, to determine if there are any measurable inputs of contaminants from the Site. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The data collected will be used to detect aquatic life impairments and assess their relative severity. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The data collected will be compared against ESLs[1] to assess if Quarry Pond aquatic ecosystem health is potentially impaired. Additionally, CRA will compare the data to USEPA Industrial Soil criteria to identify any potential human health risks. Industrial Soil RSLs are proposed as a surrogate for human exposure risks from sediments, due to the limited exposure frequency in the Quarry Pond compared to a residential exposure scenario. Residential Soil RSLs will be used as an initial screening step to account for early-life susceptibility to mutagens for child receptors. The data collected will ultimately be used in the Baseline Risk Assessment for OU2. The data will be used to determine if there is a need to cap or otherwise remediate the sediments in the Quarry Pond. The sediment data will be used to determine if bioaccumulative contaminants are present and to model edible fish concentrations for the HHRA.
	v) Resources, constraints, deadlines	Sufficient resources will be committed to sample sediments under the OU2 RI/FS work plan.			Sufficient resources will be committed to sample sediments under the OU2 RI/FS work plan.

[1] Ecological Screening Levels (ESLs) will be presented and defined in the Screening Level Environmental Risk Assessment (SLERA) workplan

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
2	*Goals of the Study:*				
	i) Primary study question	Does sediment in the GMR and/or Quarry Pond contain Site-related contaminants at concentrations greater than ESLs[1] and/or Industrial Soil RSLs and/or Residential Soil RSLs for protection of human health?	Does the Site add significantly to contaminants in sediments in the GMR adjacent to and down-gradient of the Site?	Are benthic organisms at risk due to sediment concentrations caused by Site-related contamination?	Do sediments in the Quarry Pond contain contaminant concentrations greater than ESLs[1] and/or Industrial Soil RSLs and/or Residential Soil RSLs for protection of human health?
	ii) Alternate outcomes or actions	- If sampling demonstrates that contaminants in sediment are less than screening levels/criteria, no further sampling is planned. - If sampling demonstrates that contaminants are present at concentrations greater than screening levels/criteria, and that contaminant concentrations are greater than upstream conditions (see Phase 1B-GMR to right), further evaluation and/or remedial measures may be warranted.	- If sampling demonstrates conditions adjacent to the Site are less than or equal to those found upstream, no further sampling is planned. - If sampling demonstrates contaminant concentrations are greater than those upstream, and that contaminant concentrations are greater than Action Level criteria (see Phase 1A-GMR to left), further evaluation and/or remediation may be warranted. Further evaluation may consist of an ecological study (i.e., benthic community study; see Phase 2-GMR to the right).	- If the community survey demonstrates that aquatic life in the GMR is not affected by Site-related contaminants, no further sampling is planned. - If the community survey demonstrates that Site-related contaminants impair aquatic life in the GMR and/or the Quarry Pond, further evaluation and/or remedial measures may be warranted.	- If sampling demonstrates that contaminants in sediment are less than screening levels/criteria, no further sampling is planned. - If sampling demonstrates that contaminants are present at concentrations greater than screening levels/criteria, further evaluation and/or remedial measures may be warranted (i.e., acute bioassays on representative Quarry Pond sediments).
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)			

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Medium:*	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
	Investigation Item:	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
	iv.a) Decision statement	Determine whether any contaminant concentrations are greater than Industrial Soil RSLs, Residential Soil RSLs, ESLs, or if the sum of Equilibrium Partitioning Sediment Benchmark Toxic Units (∑ESBTUFCV) > 1, or if the organic carbon normalized excess Simultaneously Extracted Metal (∑SEM) > 150 µmol/goc in the GMR sediments near the Site, or if the concentrations of arsenic are greater than its Probable Effects Concentration (PEC).	Determine whether any measurable input of contaminants from the Site, relative to upstream conditions, occurs in the GMR sediments near the Site.	Determine whether any measureable impact to aquatic life in the GMR occurs due to contaminants from the Site, relative to upstream conditions	Determine whether any contaminant concentrations are greater than ESLs, USEPA Industrial soil criteria, USEPA Residential soil criteria, Sum of Equilibrium Partitioning Sediment Benchmark Toxic Units (∑ESBTUFCV) > 1, or organic carbon normalized excess Simultaneously Extracted Metal (∑SEM) > 150 µmol/goc in the on-Site Quarry Pond sediments.
	iv.b) Estimation statement & assumptions	--			

3 ***Identify Information Inputs:***

i) Information types needed	Sediment sample analysis is required to assess conditions in the GMR near the Site.	A benthic community survey may be required to assess the impact to aquatic life in the GMR near the Site.	Sediment sample analysis is required to assess conditions in the Quarry Pond.
ii) Information Sources	- New data from the investigation will form the basis of assessment. The results from three previous sediment samples collected from the GMR, as well as results of soil samples will be considered during interpretation of the data obtained. - Sediment samples will be analyzed for TCL VOCs, TCL SVOCs (including PAHs), TCL pesticides, TCL herbicides, TAL metals, divalent metals (copper, cadmium, mercury, nickel, lead and zinc) using AVS/SEM analyses, and total metals (including arsenic), organic carbon, black carbon, major anions (chloride, fluoride, cyanide, nitrate, nitrite, sulphate, sulphide) and indicator parameters (pH, temperature, conductivity, oxidation reduction potential (ORP), and dissolved oxygen, and reduction-oxidation (REDOX) parameters.	- New data from the community survey will form the basis of assessment. The results from Phase 1A-GMR and 1B-GMR(see left) will be considered during interpretation of the data obtained.	- New data from the investigation will form the basis of assessment. The results from previous sediment samples collected from the Quarry Pond, as well as results of soil samples will be considered during interpretation of the data obtained. Sediment samples will be analyzed for TCL VOCs, TCL SVOCs (including PAHs), TCL pesticides, TCL herbicides, total TAL metals (including arsenic), divalent metals (copper, cadmium, mercury, nickel, lead and zinc) using AVS/SEM analyses, organic carbon, black carbon, major anions (chloride,

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
					fluoride, cyanide, nitrate, nitrite, sulphate, sulphide) and indicator parameters (pH, temperature, conductivity, oxidation reduction potential (ORP), and dissolved oxygen, and reduction-oxidation (REDOX) parameters.
	iii) Basis of Action Level	Action levels are: - Industrial Soil RSLs - Final Chronic Values (FCV) for PAHs, ∑ESBTUFCV < 1 - Excess SEM < 150 µmol/goc - PEC values for arsenic - Residential Soil RSLs will be used as an initial screening step to account for early-life susceptibility to mutagens for child receptors	The selected action level is a background threshold value (e.g., 95th percentile) based on upstream conditions.	Population and community level response will be evaluated.	Action levels are: - Industrial Soil RSLs - Final Chronic Values (FCV) for PAHs, ∑ESBTUFCV < 1 - Excess SEM < 150 µmol/goc - PEC values for arsenic - Residential Soil RSLs will be used as an initial screening step to account for early-life susceptibility to mutagens for child receptors
	iv) Appropriate sampling & analysis methods	- Methods are described in the Field Sampling Plan (CRA, May, 2013, CRA's Standard Operating Procedures, and the Quality Assurance Project Plan (CRA, September 2008). - Organic carbon in sediments will be analyzed using the Lloyd Kahn or Walkley-Black methods. - PAH results will be evaluated against ∑ESBTUFCV, as detailed in USEPA, 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA-600-R-02-013. - Divalent metals results will be evaluated against the organic carbon normalized excess ∑SEM.		A benthic community survey will be completed in accordance with USEPA Rapid Bioassessment Protocols (EPA 841-B-99-002) or OEPA assessment methods (OEPA, 1989. Biological criteria for the protection of aquatic life), depending on the habitat.	- Methods are described in the Field Sampling Plan, CRA's Standard Operating Procedures, and the Quality Assurance Project Plan. - Organic carbon in sediments will be analyzed using the Lloyd Kahn or Walkley-Black methods. - PAH results will be evaluated against ∑ESBTUFCV, as detailed in USEPA, 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA-600-R-02-013. - Metals results will be evaluated against the organic carbon normalized excess ∑SEM.

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
4	*Define the Boundaries of the Study:*				
	i) Target population, sample units	The target population are the upper (available) layer of sediments (0 - 6 inches below sediment/water interface), and subsurface sediment (greater than 6 inches below sediment/water interface) in the GMR adjacent to the Site. The sampling units are individual grab samples collected from the near-Site reaches of the GMR. Areas easily accessible to humans and with evidence of use will be targeted for sediment sample locations (e.g., areas where anglers or other recreational users are present; areas where water is approximately 3 ft deep or less and where sediment can support body weight. Depositional areas will also be targeted to identify potential ecological risks. Sediment samples will also be collected in depositional locations immediately downstream of any point discharges identified between the upstream dam and the southern Site boundary. The sediment sample locations may be adjusted based on the location of intermittent drainage pathways (if any).	The target population is the upper (available) layer of sediments (0 - 6 inches below sediment/water interface) and subsurface sediment (greater than 6 inches below sediment/water interface) in the upstream sampling locations. The sampling units are individual grab samples collected from the upstream reaches of the GMR. Areas easily accessible to humans and with evidence of use will be targeted for sediment sample locations (e.g., areas where anglers or other recreational users are present; areas where water is approximately 3 ft deep or less and where sediment can support body weight. Depositional areas will also be targeted to identify potential ecological risks. Sediment samples will be collected in depositional locations immediately downstream of any point discharges identified between the upstream dam and east of the Dryden Road bridge. The sediment sample locations may be adjusted based on the location of intermittent drainage pathways (if any).	The target population is the aquatic life in the GMR in the vicinity of the Site. The sampling units are composite samples collected from the GMR, divided by upstream, near-Site, and downstream reaches. Sampling efforts may be concentrated in near-shore habitats, where most species will be collected.	The target populations are the upper (available) layer of sediments (0 - 6 inches below sediment/water interface), and subsurface sediment (greater than 6 inches below sediment/water interface) in the Quarry Pond. The sampling units are individual grab samples collected from the Quarry Pond. Depositional areas and areas where visual evidence of potential leachate migration is observed will be targeted for sediment sample locations. The sample locations may be adjusted based on the locations of intermittent drainage pathways, storm water runoff pathways, if any are identified, and the results of underwater survey inspections conducted by Ohio EPA, Ohio DNR and the Attorney General's Office – Bureau of Criminal Investigations Office, to include consideration of any areas where foreign objects may have been deposited and the likelihood of sediment contamination may be greater.

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

Medium:	*GMR Sediment*			*Quarry Pond Sediments*
Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step / *Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
ii) Specify spatial boundaries	Near-Site sampling locations are those occurring to the west of the Dryden Road bridge (i.e., as surface water passes the Site), and these will be located on the near (south and east) shore of the GMR. Sediment samples will be collected from the top of the sediment layer (i.e., 0 - 6 inches below the sediment/water interface), and subsurface sediments (i.e., greater than 6 inches below the sediment/water interface) in the GMR.	Upstream sampling locations are to the east of the Dryden Road bridge. Sediment samples will be collected from the top of the sediment layer (i.e., 0 - 6 inches below the sediment/water interface), and subsurface sediments (i.e., greater than 6 inches below the sediment/water interface) in the GMR.	Upstream sampling locations are to the east of the Dryden Road bridge. Near-Site sampling locations are those occurring to the west of the Dryden Road bridge (i.e., as surface water passes the Site), and these will be located on the near (south and east) shore of the GMR. Downstream sampling locations are to the south of the City of Dayton Wastewater Treatment Plant.	Sediment samples will be collected from the top of the sediment layer (i.e., 0 - 6 inches below the sediment/water interface), and subsurface sediments (i.e., greater than 6 inches below the sediment/water interface) in the Quarry Pond.
iii) Specify temporal boundaries	The temporal boundaries are indefinite, assuming continued exposure at levels found during sampling. The practical temporal limits are based on exposure assumptions forming the basis for the Action Levels. Initial monitoring will occur over one sampling round. The Respondents will evaluate sediment sample results, and propose additional sampling, if required (e.g. to further evaluate any observed spatial differences, or further define the extent and magnitude of contamination)			The temporal boundaries are indefinite, assuming continued exposure at levels found during sampling. The practical temporal limits are based on exposure assumptions forming the basis for the Action Levels.
iv) Identify any other practical constraints	Sampling may be postponed due to flooding or ice conditions in the GMR. If any dams/weirs are encountered, samples will be collected from the side of the dam closest to the Site (i.e., downstream of any upstream dams, and upstream of any downstream dams).			Sampling may be postponed due to flooding or ice conditions of the Quarry Pond.
v.a) Scale of inference for decision making	Comparisons to Action Levels will be carried out on an individual-location basis.	Comparisons to upstream conditions will be carried out on an individual-location basis.	Criteria in biological indices will be used to evaluate the impacts on aquatic life.	Comparisons to Action Levels will be carried out on an individual-location basis.
v.b) Scale of estimates	--			

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
5	***Develop the Analytic Approach:***				
	i.a) Specify Action Level	- Residential Soil RSLs will be used as an initial screening step to account for early-life susceptibility to mutagens for child receptors - Industrial Soil RSLs - Final Chronic Values (FCV) for PAHs, ∑ESBTUFCV < 1 - Excess SEM < 150 µmol/goc - PEC values for arsenic	Background Threshold Values based on upstream data, following USEPA's ProUCL Technical Guide (2013)	Criteria in biological indices, consisting of the Index of Well-Being (Gammon 1976; Gammon *et al. 1981)*, the Index of Biotic Integrity (Karr 1981; Fausch *et al.* 1984), and the Invertebrate Community Index (DeShon *et al.* unpublished)	- Residential Soil RSLs will be used as an initial screening step to account for early-life susceptibility to mutagens for child receptors - Industrial Soil RSLs - Final Chronic Values (FCV) for PAHs, ∑ESBTUFCV < 1 - Excess SEM < 150 µmol/goc - PEC values for arsenic
	i.b) Specify estimator	--	--	--	--
	ii.a) Specify population parameter of interest and theoretical decision rule	Individual observations at near-Site sampling locations.		Cumulative observations at near-Site sampling locations.	Individual observations at near-Site sampling locations.
	ii.b) Specify estimation procedure	--	--	--	--

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
6	***Specify Performance or Acceptance Criteria:***				
	i.a) Set baseline (null) and alternative hypotheses	Baseline H_0: sediment concentrations are less than Action Levels Alternative H_1: sediment contaminant concentrations are greater than Action Levels	Baseline H_0: Concentrations of Site-related chemicals in near-Site sediments are no different than upstream Alternative H_1: Concentrations of Site-related chemicals in near-Site sediments contain contaminants at concentrations greater than upstream conditions	Baseline H_0: aquatic ecosystem in near-Site reaches are no different than upstream Alternative H_1: aquatic ecosystem in near-Site reaches is impaired in comparison to upstream conditions.	Baseline H_0: sediment concentrations are less than Action Levels Alternative H_1: sediment contaminant concentrations are greater than Action Levels
	i.b) Specify how uncertainty accounted for in estimate	--	--	--	--
	ii.a) Determine impact of decision errors (false positives/negatives)	N/A: no statistical test is employed (direct comparison to Action Levels)	- If a false positive (Type I) error occurs, unnecessary additional investigation may occur. - If a false negative (Type II) error occurs, conditions that are not due to background concentrations and pose potential risk to aquatic ecosystem and/or human receptors could persist.	- If a false positive (Type I) error occurs, unnecessary additional investigation may occur. - If a false negative (Type II) error occurs, conditions posing potential risk to the aquatic ecosystem could persist.	N/A: no statistical test is employed (direct comparison to Action Levels)
	ii.b) Specify confidence level for estimate	--	--	--	--

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
	iii) Specify "gray region" for test	N/A: no statistical test is employed (direct comparison to Action Levels)	For comparisons to upgradient conditions, the gray region will be set equal to a difference in means (on-Site and upgradient) of one standard deviation of the upgradient data.	--	N/A: no statistical test is employed (direct comparison to Action Levels)
	iv.a) Set tolerable limits on decision errors	N/A: no statistical test is employed (direct comparison to Action Levels)	- The Background Threshold Values will be calculated using a 95 percent confidence level, making the false positive rate no greater than 5 percent. - Limits on the false negative rate are not appropriate for comparisons of individual results to threshold values.	--	N/A: no statistical test is employed (direct comparison to Action Levels)
	iv.b) Specify performance or acceptance criteria	Total sediment concentrations will be used in the comparison to Action Levels, rather than subtracting background concentrations, for evaluation in the Ecological Risk Assessment.		--	Total sediment concentrations will be used in the comparison to Action Levels, rather than subtracting background concentrations, for evaluation in the Ecological Risk Assessment.

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
7	***Develop the Plan for Obtaining Data:***				
	i) Select sampling design	Near-Site samples will be collected in one sampling event close to the proximate (south/east) shore of the GMR at (i) the upstream edge of the Site, including both a near-shore and far-shore sample; (ii) mid-Site, downgradient of monitoring wells containing highest VOC concentrations on the side of the Site nearest the river; (iii) further downstream in the mid-Site region, halfway between (ii) and (iv); (iv) downstream of the main Site, upstream of the City's WWTP outlet; and (v) downstream of the entire Site. Samples will be biased towards locations with fine-grained sediments with higher organic carbon (based on visual observation). Proposed sample locations will be adjusted in the field to ensure that the samples are collected from sediments most representative of potential worst-case issues.	Upstream samples will be collected in one sampling event at 9 locations to provide a suitable data set (per USEPA's ProUCL Technical Guide, 2010) for the calculation of Background Threshold Values. Upstream samples will be collected along 3 transects of 3 samples each, regularly spaced downstream of the upstream dam, and upstream low-head of the Site. Near-Site samples will be collected as described in Phase 1A (see left).	Near-Site samples will be collected close to the proximate (south/east) shore of the GMR at (i) the upstream edge of the Site, including both a near-shore and far-shore sample; (ii) mid-Site, downgradient of monitoring wells containing highest VOC concentrations on the side of the Site nearest the river; (iii) further downstream in the mid-Site region, halfway between (ii) and (iv); (iv) downstream of the main Site, upstream of the City's WWTP outlet; and (v) downstream of the entire Site. The sampling effort may be concentrated in near-shore habitats where most species will be collected and will be biased toward areas where the greatest sediment impacts were identified during the Phase 1A and 1B investigations.	Up to 9 samples will be collected from the Quarry Pond, along 3 transects of 3 samples each. Samples will be biased towards locations with fine-grained sediments with higher organic carbon (based on visual observation). Proposed sample locations will be adjusted in the field to ensure that the samples are collected from sediments most representative of potential worst-case issues.

TABLE 3.5

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – SEDIMENT INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Medium:	*GMR Sediment*			*Quarry Pond Sediments*
	Investigation Phase:	*Phase 1A – GMR*	*Phase 1B – GMR*	*Phase 2 - GMR*	*Phase 1A - Quarry Pond*
DQO Step	*Investigation Item:*	*Comparison to Human Health and Ecological Screening Values*	*Comparison to Upstream Conditions*	*Benthic Sampling*	*Comparison to Human Health and Ecological Screening Value*
	ii) Specify/evaluate key assumptions supporting the design	The mechanisms of contaminant transport from the Site to river sediments, i.e., via groundwater migration and seepage or via erosion and runoff, would result in greatest impacts (if any) near-shore and potentially, due to groundwater seepage, midstream. Sampling locations have been selected reflecting this, and covering different potential directions of transport and deposition, covering the full range of possibilities from the Site.	The calculation Background Threshold Values (statistical limits on an upper percentile, e.g. 95th) for the upstream population of sediments depends on data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.	The mechanisms of contaminant transport from the Site to river sediments, i.e., via groundwater migration and seepage or via erosion and runoff, would result in greatest impacts (if any) near-shore. Sampling locations have been selected reflecting this, and covering different potential directions of transport and deposition, covering the full range of possibilities from the Site.	The mechanisms of contaminant transport from the Site to pond sediments, i.e., via groundwater migration and seepage or via erosion and runoff, would result in greatest impacts (if any) near-shore. Sampling locations have been selected reflecting this, and covering different potential directions of transport and deposition, covering the full range of possibilities from the Site.

Notes:

[1] If investigating a "decision problem", follow items ending in ".a" in subsequent DQO steps (e.g., "ii.a" or "iii.a").
If investigating an "estimation problem", follow ".b" items.
Once the baseline risk assessment for OU2 has been performed, possible remedial goals (PRGs) will be derived from the calculator using site-specific risks.

-- Item not applicable for the type of problem (decision vs. estimation) investigated.

The planning team includes:
Respondents: Ken Brown (ITW); Jim Campbell (ITW); Bryan Heath (NCR); Wendell Barner (TRW)
Steve Quigley (CRA Project Director); Adam Loney (CRA project manager);
Wesley Dyck, Daniela Araujo (CRA statistics expert);
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Julian Hayward, Valerie Chan (CRA project engineers); Mark Hilverda (CRA project hydrogeologist);
Leslie Patterson (USEPA Regional Project Manager); Maddie Smith (Ohio EPA representative); and property owner stakeholders.

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
1	***State the Problem***			
	i) Problem description	Potential risk to industrial workers from exposure to on-Site soils has been identified in a human health risk assessment. It is not known if potential soil contamination in the floodplain (a) poses risks to human receptors due to recreational use, and (b) is a result of migration from the Site. Analysis of floodplain soil samples is required to make these assessments. It is also unknown whether floodplain soils pose ecological risks either in-situ or if soils are eroded and enter the Great Miami River (GMR).		If, during Phase 1, floodplain soil containing Site-related contaminants at concentrations greater than screening values and background reference conditions is identified, characterization of conditions within the exposure unit (i.e., nature and extent of contamination) is required for risk assessment purposes.
	ii) Planning team	See note at bottom		
	iii) Conceptual model	- Cover material at the Site is limited or non-existent, which could lead to erosional run-off of contaminants towards the floodplain of the GMR, which may pose a risk to human and ecological receptors. - In addition, movement of contaminants in dust particles carried by wind may result in deposition of contaminants off-Site. - Soil contaminants are assumed to have been deposited by erosion and mixed by subsequent flooding events. -The floodplain can serve as habitat for small mammals and birds.		
	iv) General intended use for data	The data collected will be screened against health-based and ecological risk values. The goal of the investigation is to identify human health direct contact, ingestion, and inhalation risks, and ecological risks associated with surficial soil in the floodplain and determine the magnitude and extent of contamination from Site-related contaminants.	The data collected from sampling locations along the Site's boundaries will be compared to upstream floodplain soil conditions, to determine if there are any measurable inputs of contaminants from the Site and determine the magnitude and extent of contamination from Site-related contaminants. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.	The collected data will be used to determine the magnitude and extent of contamination from Site-related contaminants, and generate human health and/or ecological exposure estimates for a risk assessment. The data collected will ultimately be used in the Baseline Risk Assessment for OU2.
	v) Resources, constraints, deadlines	Sufficient resources will be committed to sample off-Site soil under the OU2 RI/FS work plan. Sampling may be postponed due to flooding, and could be constrained due to access agreements in off-Site areas.		

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
2	***Goals of the Study:***			
	i) Primary study question	Do near-Site floodplain soils contain Site-related contaminants at concentrations that pose a potential risk to receptors, based on the use of screening criteria, i.e., Residential Soil RSLs, and/or Site-specific risk-based values? If so, what are the risks?	Does the Site add contaminants to soil in the floodplain of the GMR near the Site?	What are the risks from floodplain soils contaminated by Site-related sources?
	ii) Alternate outcomes or actions	- If sampling demonstrates that contaminants in soil are less than risk-based screening levels/criteria, no further sampling is planned. - If sampling demonstrates that contaminant concentrations are greater than screening levels/criteria, and greater than background reference conditions (see Phase 1B to right), further evaluation and/or remedial measures may be warranted.	- If sampling demonstrates conditions adjacent to the Site are not greater than those found in background reference soils, no further sampling is planned. - If sampling demonstrates conditions are greater than background, and that contaminant concentrations are greater than Action Level criteria (see Phase 1A to left), further evaluation and/or remediation may be warranted.	- If sampling demonstrates that health risks are acceptable, no further action is required. - If sampling demonstrates unacceptable risks, further evaluation, risk management and/or remediation would be required.
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)	Decision (Action Level)	Estimation
	iv.a) Decision statement	Determine whether any contaminant concentrations are greater than USEPA Residential Soil RSLs or Site-specific risk values in off-Site floodplain soil near the Site.	Determine whether any measurable input of contaminants from the Site, relative to background reference conditions, occurs in near-Site floodplain soil near the Site.	--
	iv.b) Estimation statement & assumptions	--	--	The parameter of interest is 95% UCL of the mean (for estimating inhalation, dermal exposure, and ingestion risks, etc.) of soil contaminant concentrations within an identified off-Site exposure area. Section 5.2 of the OU2 RI/FS Work Plan details the proposed exposure units.

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
3	***Identify Information Inputs:***			
	i) Information types needed	- Soil sample analysis is required to assess conditions in the floodplain of the GMR near the Site. - Soil samples will be collected at locations adjacent to (i.e., downgradient of) known on-Site issues, and also biased toward erosional areas. -Background soil contaminant concentrations (from Table 3.1)		- This would be a supplemental data collection effort, with analyses performed on soil samples obtained to fill in any data gaps across the exposure area.
	ii) Information Sources	- New data from the investigation will form the basis of assessment. The results from three previous sediment samples collected from the GMR will be considered during interpretation of the data obtained.		- New data from the investigation will form the basis of assessment. Available previous validated data (e.g., from Phase 1), within the exposure area would also be used.
	iii) Basis of Action Level	Action Levels are: - USEPA Residential Soil RSLs -USEPA RCRA ESLs[1]	The selected Action Level is a Background Threshold Value (e.g., 95th percentile) based on background reference conditions.	--
	iv) Appropriate sampling & analysis methods	Methods are described in the Field Sampling Plan (CRA, May, 2013) and the Quality Assurance Project Plan (CRA, September 2008).		

[1] Ecological Screening Levels (ESLs) will be presented and defined in the Screening Level Environmental Risk Assessment (SLERA) workplan

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
4	***Define the Boundaries of the Study:***			
	i) Target population, sample units	The target population is surficial soil on the floodplain of the GMR near the Site. CRA has defined the single exposure unit of the floodplain to be the length of bike path/recreational trail adjacent to the Site boundary, as this is the area of heaviest traffic in which receptors are most likely exposed to any Site-related contamination, as discussed in Section 5.2 of the OU2 RI/FS Work Plan. The sampling units are individual samples collected from surface soil located between the Site embankment and the bike path.	The sampling units are individual samples collected from surface soil from background reference sampling locations. Background reference sampling locations will be identified in areas outside a reasonable zone of potential influence (via surface runoff or substantial airborne dust deposition) for the Site.	Target population is surficial floodplain soils comprising the exposure unit for assessment of exposure risks for human receptors.
	ii) Specify spatial boundaries	The spatial boundaries of the floodplain soil sampling locations are the floodplain soil of the GMR, located between the Site embankment and the bike path/recreational trail.	The spatial boundaries of the floodplain soil sampling locations are the floodplain soil of the GMR, located between the Site embankment and the bike path/recreational trail.	The spatial boundaries are the limits of the surficial soils in the identified off-Site exposure area (based on Phase 1 findings).
	iii) Specify temporal boundaries	The temporal boundaries are indefinite, assuming continued exposure at levels found during sampling. The practical temporal limits are based on the exposure assumptions of the Action Levels.		
	iv) Identify any other practical constraints	Due to the presence of a high pressure gas line in the floodplain, soil samples will be hand-dug. If different surficial soil subtrates are encountered (e.g., silt vs. sand vs. clay), these differences may require additional sampling (e.g., further reference samples) to appropriately evaluate potential Site-related impacts. Off-Site sampling may be restricted by permission of property owners, e.g. for background locations.		Further practical constraints are not anticipated for sampling of floodplain soils near to the Site.
	v.a) Scale of inference for decision making	Comparisons to Action Levels will be carried out on an individual-location basis.	Comparisons to background reference conditions will be carried out on an individual-location basis.	--
	v.b) Scale of estimates	--	--	The scale of the exposure estimate is to be identified in a Site-specific risk assessment.

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
5	***Develop the Analytic Approach:***			
	i.a) Specify Action Level	1) USEPA Residential Soil RSLs 2) USEPA RCRA ESLs[1]	Background Threshold Values based on background reference data, following USEPA's ProUCL Technical Guide (2013)	--
	i.b) Specify estimator	--	--	The arithmetic mean (per USEPA RAGS requirements) surface soil concentration of each contaminant that is greater than screening criteria.
	ii.a) Specify population parameter of interest and theoretical decision rule	Individual observations at near-Site sampling locations.		--
	ii.b) Specify estimation procedure	--	--	The study will estimate the mean concentration of the exposure unit population represented by the soil samples obtained.

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
6	***Specify Performance or Acceptance Criteria:***			
	i.a) Set baseline (null) and alternative hypotheses	Baseline H_0: soil sample concentrations are less than Action Levels Alternative H_1: soil samples contaminated at concentrations greater than Action Levels	Baseline H_0: near-Site floodplain soil sample concentrations are no different than reference Alternative H_1: near-Site floodplain soil samples contain contaminants at concentrations greater than reference conditions	--
	i.b) Specify how uncertainty accounted for in estimate	--	--	Uncertainty will be accounted for using a confidence interval on the population mean (per USEPA RAGS guidance).
	ii.a) Determine impact of decision errors (false positives/negatives)	N/A: no statistical test is employed (direct comparison to Action Levels)	- If a false positive (Type I) error occurs, unnecessary additional investigation (Phase 2) may occur. - If a false negative (Type II) error occurs, conditions that are not due to background concentrations of contaminants and that pose potential health risks to receptors persist.	--
	ii.b) Specify confidence level for estimate	--	--	The confidence level of the estimate will be 95 percent, unless specified otherwise (based on data distribution and/or the presence of non-detect results) in USEPA's ProUCL Technical Guide (2013).
	iii) Specify "gray region" for test	N/A: no statistical test is employed (direct comparison to Action Levels)	N/A: since comparing individual concentrations against reference conditions, no statistical test is employed	--
	iv.a) Set tolerable limits on decision errors	N/A: no statistical test is employed (direct comparison to Action Levels)	The Background Threshold Values will be calculated using a 95 percent confidence level, making the false positive rate no greater than 5 percent. Limits on the false negative rate are not appropriate for comparisons of individual results to threshold values.	--
	iv.b) Specify performance or acceptance criteria	--	--	The lesser value of the 95 percent UCL on the population mean or the maximum individual measurement will be used for comparison to risk-based criteria.

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*Phase 1A* / *Comparison to Site-Specific Risk Values*	*Phase 1B* / *Comparison to Background Reference Conditions*	*Phase 2* / *Additional sampling (if necessary) to develop risk assessment exposure estimates*
7	***Develop the Plan for Obtaining Data:***			
	i) Select sampling design	Near-Site surficial soil samples will be collected on the floodplain. These include (i) the upgradient edge of the Site; (ii) mid-Site, downgradient of monitoring wells containing highest VOC concentrations on the side of the Site nearest the river; (iii) further downgradient, halfway between (ii) and (iv); and (iv) at the furthest downgradient boundary of the Site. Approximately 15 surficial soil samples will be collected from the near-Site portion of the floodplain around the recreational trail.	Background reference samples will be collected at 10 locations to provide a suitable data set (per USEPA's ProUCL Technical Guide, 2013) for the calculation of Background Threshold Values. Near-Site samples will be collected as described in Phase 1A (see left).	A minimum of 10 samples, per USEPA's ProUCL Technical Guide (2013), spaced on a regular grid with random origin (i.e., a systematic random sampling design), will be obtained for each exposure area identified in the risk assessment. Samples collected during Phase 1 will be included within the 10 sample data set.
	ii) Specify/evaluate key assumptions supporting the design	Contaminant transport from the Site to floodplain soils via erosion/runoff is expected to result in greatest impacts (if any) closest to the Site at the base of the embankment. Sampling locations have been selected reflecting this (i.e., including locations biased towards areas with highest contamination potential), and cover all different potential directions of transport/deposition from the Site.	The calculation Background Threshold Values (statistical limits on an upper percentile, e.g. 95th) for the reference population of surficial soils depends on data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.	The calculation of 95 percent upper confidence limits on a population mean makes assumptions of data characteristics (e.g., distribution and proportion of detected values), as fully discussed in the USEPA ProUCL Technical Guide (2013). Additionally, the presence of outlying values will be tested, and if present their impact on the values obtained evaluated.

TABLE 3.6

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS – FLOODPLAIN SOIL INVESTIGATION
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL SITE, MORAINE, OHIO

	Investigation Phase:	*Phase 1A*	*Phase 1B*	*Phase 2*
DQO Step	*Investigation Item:*	*Comparison to Site-Specific Risk Values*	*Comparison to Background Reference Conditions*	*Additional sampling (if necessary) to develop risk assessment exposure estimates*

Notes:

[1] If investigating a "decision problem", follow items ending in ".a" in subsequent DQO steps (e.g., "ii.a" or "iii.a").
If investigating an "estimation problem", follow ".b" items.
Once the baseline risk assessment for OU2 has been performed, possible remedial goals (PRGs) will be derived from the calculator using site-specific risks.

-- Item not applicable for the type of problem (decision vs. estimation) investigated.

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APPENDIX A

PROJECT ORGANIZATION

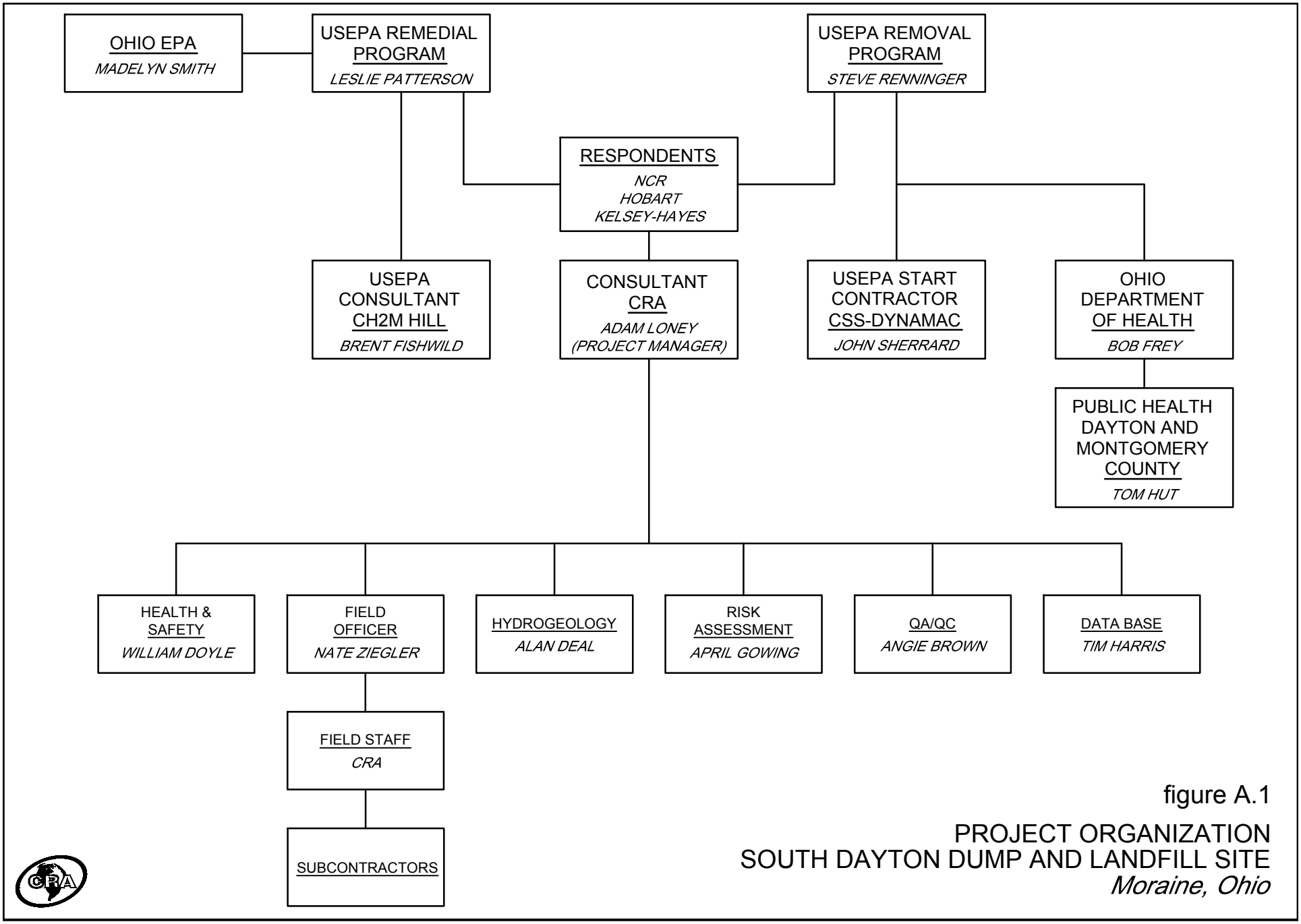

figure A.1

PROJECT ORGANIZATION
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-14(019)GN-WA011 APR 30/2014

APPENDIX B

OU2 PARCELS GROUNDWATER ANALYTICAL RESULTS

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120108-DD-144*	*GW-38443-120208-DD-145*	*GW-38443-120208-DD-146*	*GW-38443-120208-DD-147*	*GW-38443-120208-DD-148*
Sample Date:					*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*
Sample Depth:					*12-17 ft BGS*	*17-22 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.05 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.05 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.05 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetone	-	1.2	2236	9784	0.05 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Benzene	0.005	0.00039	0.0014	0.0071	0.005 U	0.001 U	0.001 U	0.00023 J	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.005 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Cyclohexane	-	1.3	0.103	0.42	0.005 U	0.00013 J	0.001 U	0.00027 J	0.00014 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.05 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.025 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120108-DD-144*	*GW-38443-120208-DD-145*	*GW-38443-120208-DD-146*	*GW-38443-120208-DD-147*	*GW-38443-120208-DD-148*
Sample Date:					*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*
Sample Depth:					*12-17 ft BGS*	*17-22 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	**0.18**[b]	0.0014	0.0017	0.0015	0.0011
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)	10	0.019	0.047	0.21	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	0.001 U	0.001 U	-	-	-
2,4,5-Trichlorophenol	-	0.089	-	-	0.005 U	0.005 U	-	-	-
2,4,6-Trichlorophenol	-	0.0009	-	-	0.005 U	0.005 U	-	-	-
2,4-Dichlorophenol	-	0.0035	-	-	0.002 U	0.002 U	-	-	-
2,4-Dimethylphenol	-	0.027	-	-	0.002 U	0.002 U	-	-	-
2,4-Dinitrophenol	-	0.003	-	-	0.005 U	0.005 U	-	-	-
2,4-Dinitrotoluene	-	0.0002	-	-	0.005 U	0.005 U	-	-	-
2,6-Dinitrotoluene	-	0.000042	-	-	0.005 U	0.005 U	-	-	-
2-Chloronaphthalene	-	0.055	-	-	0.001 U	0.001 U	-	-	-
2-Chlorophenol	-	0.0071	-	-	0.001 U	0.001 U	-	-	-
2-Methylnaphthalene	-	0.0027	-	-	0.0002 U	0.0002 U	-	-	-
2-Methylphenol	-	0.072	-	-	0.001 UJ	0.001 UJ	-	-	-
2-Nitroaniline	-	0.015	-	-	0.002 U	0.002 U	-	-	-
2-Nitrophenol	-	-	-	-	0.002 U	0.002 U	-	-	-
3,3'-Dichlorobenzidine	-	0.00011	-	-	0.005 U	0.005 U	-	-	-
3-Nitroaniline	-	-	-	-	0.002 U	0.002 U	-	-	-
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	0.005 U	0.005 U	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-
4-Chloro-3-methylphenol	-	0.11	-	-	0.002 U	0.002 U	-	-	-
4-Chloroaniline	-	0.00032	-	-	0.002 U	0.002 U	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-
4-Methylphenol	-	0.14	-	-	0.001 U	0.001 U	-	-	-
4-Nitroaniline	-	0.003	-	-	0.002 U	0.002 U	-	-	-
4-Nitrophenol	-	-	-	-	0.005 U	0.005 U	-	-	-
Acenaphthene	-	0.04	-	-	0.0002 U	0.0002 U	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120108-DD-144*	*GW-38443-120208-DD-145*	*GW-38443-120208-DD-146*	*GW-38443-120208-DD-147*	*GW-38443-120208-DD-148*
Sample Date:					*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*
Sample Depth:					*12-17 ft BGS*	*17-22 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-
Acetophenone	-	0.15	-	-	0.001 U	0.001 U	-	-	-
Anthracene	-	0.13	-	-	0.0002 U	0.0002 U	-	-	-
Atrazine	0.003	0.00026	-	-	0.001 U	0.001 U	-	-	-
Benzaldehyde	-	0.150	-	-	0.001 U	0.001 U	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	0.0002 U	0.0002 U	-	-	-
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	0.001 U	0.001 U	-	-	-
bis(2-Chloroethoxy)methane	-	0.0046	-	-	0.001 U	0.001 U	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	0.001 UJ	0.001 UJ	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	0.00089 J	0.002 U	-	-	-
Butyl benzylphthalate (BBP)	-	0.014	-	-	0.001 U	0.001 U	-	-	-
Caprolactam	-	0.77	-	-	0.005 UJ	0.005 UJ	-	-	-
Carbazole	-	-	-	-	0.001 U	0.001 U	-	-	-
Chrysene	-	0.0029	-	-	0.0002 U	0.0002 U	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-
Dibenzofuran	-	0.00058	-	-	0.001 U	0.001 U	-	-	-
Diethyl phthalate	-	1.1	-	-	0.001 U	0.001 U	-	-	-
Dimethyl phthalate	-	-	-	-	0.001 U	0.001 U	-	-	-
Di-n-butylphthalate (DBP)	-	0.067	-	-	0.001 U	0.001 U	-	-	-
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	0.001 U	0.001 U	-	-	-
Fluoranthene	-	0.063	-	-	0.0002 U	0.0002 U	-	-	-
Fluorene	-	0.022	-	-	0.0002 U	0.0002 U	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	0.0002 U	0.0002 U	-	-	-
Hexachlorobutadiene	-	0.00026	-	-	0.001 U	0.001 U	-	-	-
Hexachlorocyclopentadiene	0.05	0.0022	-	-	0.01 UJ	0.01 UJ	-	-	-
Hexachloroethane	-	0.00051	-	-	0.001 U	0.001 U	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-
Isophorone	-	0.067	-	-	0.001 U	0.001 U	-	-	-
Naphthalene	-	0.00014	4.02	20.11	0.0002 U	0.0002 U	-	-	-
Nitrobenzene	-	0.00012	62.18	316.00	0.001 U	0.001 U	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	0.001 U	0.001 U	-	-	-
N-Nitrosodiphenylamine	-	0.01	-	-	0.001 U	0.001 U	-	-	-
Pentachlorophenol	0.001	0.000035	-	-	0.005 U	0.005 U	-	-	-
Phenanthrene	-	-	-	-	0.0002 U	0.0002 U	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120108-DD-144*	*GW-38443-120208-DD-145*	*GW-38443-120208-DD-146*	*GW-38443-120208-DD-147*	*GW-38443-120208-DD-148*
Sample Date:					*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*
Sample Depth:					*12-17 ft BGS*	*17-22 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	0.001 U	0.001 U	-	-	-
Pyrene	-	0.0087	-	-	0.0002 U	0.0002 U	-	-	-
Metals									
Arsenic	0.01	0.000045			**0.0436[ab]**	**0.165[ab]**	**0.101[ab]**	**0.0936[ab]**	**0.0322[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	-	-
Lead	0.015	-	-	-	**0.0408[a]**	**0.033[a]**	**0.0178[a]**	**0.0375[a]**	0.0127
Lead (dissolved)	0.015	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120208-DD-149*	*GW-38443-120208-DD-150*	*GW-38443-120208-DD-151*	*GW-38443-120208-DD-152*	*GW-38443-120308-DD-153*
Sample Date:					*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/3/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*67-72 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetone	-	1.2	2236	9784	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.001 U	0.001 U	0.001 U	0.00021 J	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cyclohexane	-	1.3	0.103	0.42	0.001 U	0.001 U	0.00016 J	0.001 U	0.00017 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120208-DD-149*	*GW-38443-120208-DD-150*	*GW-38443-120208-DD-151*	*GW-38443-120208-DD-152*	*GW-38443-120308-DD-153*
Sample Date:					*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/3/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*67-72 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.00049 J	0.00035 J	0.0023	0.0015	0.00057 J
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)	10	0.019	0.047	0.21	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	-	-	-	0.001 U
2,4,5-Trichlorophenol	-	0.089	-	-	-	-	-	-	0.005 U
2,4,6-Trichlorophenol	-	0.0009	-	-	-	-	-	-	0.005 U
2,4-Dichlorophenol	-	0.0035	-	-	-	-	-	-	0.002 U
2,4-Dimethylphenol	-	0.027	-	-	-	-	-	-	0.002 U
2,4-Dinitrophenol	-	0.003	-	-	-	-	-	-	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	-	-	-	-	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	-	-	-	-	0.005 U
2-Chloronaphthalene	-	0.055	-	-	-	-	-	-	0.001 U
2-Chlorophenol	-	0.0071	-	-	-	-	-	-	0.001 U
2-Methylnaphthalene	-	0.0027	-	-	-	-	-	-	0.0002 U
2-Methylphenol	-	0.072	-	-	-	-	-	-	0.001 U
2-Nitroaniline	-	0.015	-	-	-	-	-	-	0.002 U
2-Nitrophenol	-	-	-	-	-	-	-	-	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	-	-	-	0.005 U
3-Nitroaniline	-	-	-	-	-	-	-	-	0.002 U
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	-	-	-	-	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	0.002 U
4-Chloro-3-methylphenol	-	0.11	-	-	-	-	-	-	0.002 U
4-Chloroaniline	-	0.00032	-	-	-	-	-	-	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	0.002 U
4-Methylphenol	-	0.14	-	-	-	-	-	-	0.001 U
4-Nitroaniline	-	0.003	-	-	-	-	-	-	0.002 U
4-Nitrophenol	-	-	-	-	-	-	-	-	0.005 U
Acenaphthene	-	0.04	-	-	-	-	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120208-DD-149*	*GW-38443-120208-DD-150*	*GW-38443-120208-DD-151*	*GW-38443-120208-DD-152*	*GW-38443-120308-DD-153*
Sample Date:					*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/3/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*67-72 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	-	-	-	-	0.0002 U
Acetophenone	-	0.15	-	-	-	-	-	-	0.001 U
Anthracene	-	0.13	-	-	-	-	-	-	0.0002 U
Atrazine	0.003	0.00026	-	-	-	-	-	-	0.001 U
Benzaldehyde	-	0.150	-	-	-	-	-	-	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	-	-	-	-	0.001 U
bis(2-Chloroethoxy)methane	-	0.0046	-	-	-	-	-	-	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	-	-	-	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	0.0011 J
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	-	-	-	0.001 U
Caprolactam	-	0.77	-	-	-	-	-	-	0.005 U
Carbazole	-	-	-	-	-	-	-	-	0.001 U
Chrysene	-	0.0029	-	-	-	-	-	-	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	0.0002 U
Dibenzofuran	-	0.00058	-	-	-	-	-	-	0.001 U
Diethyl phthalate	-	1.1	-	-	-	-	-	-	0.001 U
Dimethyl phthalate	-	-	-	-	-	-	-	-	0.001 U
Di-n-butylphthalate (DBP)	-	0.067	-	-	-	-	-	-	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	-	-	-	-	0.001 U
Fluoranthene	-	0.063	-	-	-	-	-	-	0.0002 U
Fluorene	-	0.022	-	-	-	-	-	-	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	-	-	-	-	0.001 U
Hexachlorocyclopentadiene	0.05	0.0022	-	-	-	-	-	-	0.01 U
Hexachloroethane	-	0.00051	-	-	-	-	-	-	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	0.0002 U
Isophorone	-	0.067	-	-	-	-	-	-	0.001 U
Naphthalene	-	0.00014	4.02	20.11	-	-	-	-	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	-	-	-	-	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	-	-	-	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	-	-	-	-	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	-	-	-	-	0.005 U
Phenanthrene	-	-	-	-	-	-	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120208-DD-149*	*GW-38443-120208-DD-150*	*GW-38443-120208-DD-151*	*GW-38443-120208-DD-152*	*GW-38443-120308-DD-153*
Sample Date:					*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/3/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*67-72 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	-	-	-	-	0.001 U
Pyrene	-	0.0087	-	-	-	-	-	-	0.0002 U
Metals									
Arsenic	0.01	0.000045			**0.0057[b]**	**0.0063[b]**	**0.0356[ab]**	**0.0258[ab]**	**0.0203[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	-	-
Lead	0.015	-	-	-	0.0018	0.0023	**0.0319[a]**	**0.023[a]**	**0.0193[a]**
Lead (dissolved)	0.015	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120308-DD-154*	*GW-38443-120308-DD-155*	*GW-38443-120308-DD-156*	*GW-38443-120308-DD-157*	*GW-38443-120308-DD-158*
Sample Date:					*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*
Sample Depth:					*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetone	-	1.2	2236	9784	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.001 U	0.001 U	0.001 U	0.00024 J	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cyclohexane	-	1.3	0.103	0.42	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120308-DD-154*	*GW-38443-120308-DD-155*	*GW-38443-120308-DD-156*	*GW-38443-120308-DD-157*	*GW-38443-120308-DD-158*
Sample Date:					*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*
Sample Depth:					*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.00043 J	0.00044 J	0.00045 J	0.00046 J	0.0003 J
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)	10	0.019	0.047	0.21	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	-	-	-	0.001 U
2,4,5-Trichlorophenol	-	0.089	-	-	-	-	-	-	0.005 U
2,4,6-Trichlorophenol	-	0.0009	-	-	-	-	-	-	0.005 U
2,4-Dichlorophenol	-	0.0035	-	-	-	-	-	-	0.002 U
2,4-Dimethylphenol	-	0.027	-	-	-	-	-	-	0.002 U
2,4-Dinitrophenol	-	0.003	-	-	-	-	-	-	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	-	-	-	-	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	-	-	-	-	0.005 U
2-Chloronaphthalene	-	0.055	-	-	-	-	-	-	0.001 U
2-Chlorophenol	-	0.0071	-	-	-	-	-	-	0.001 U
2-Methylnaphthalene	-	0.0027	-	-	-	-	-	-	0.0002 U
2-Methylphenol	-	0.072	-	-	-	-	-	-	0.001 U
2-Nitroaniline	-	0.015	-	-	-	-	-	-	0.002 U
2-Nitrophenol	-	-	-	-	-	-	-	-	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	-	-	-	0.005 U
3-Nitroaniline	-	-	-	-	-	-	-	-	0.002 U
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	-	-	-	-	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	0.002 U
4-Chloro-3-methylphenol	-	0.11	-	-	-	-	-	-	0.002 U
4-Chloroaniline	-	0.00032	-	-	-	-	-	-	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	0.002 U
4-Methylphenol	-	0.14	-	-	-	-	-	-	0.001 U
4-Nitroaniline	-	0.003	-	-	-	-	-	-	0.002 U
4-Nitrophenol	-	-	-	-	-	-	-	-	0.005 U
Acenaphthene	-	0.04	-	-	-	-	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120308-DD-154*	*GW-38443-120308-DD-155*	*GW-38443-120308-DD-156*	*GW-38443-120308-DD-157*	*GW-38443-120308-DD-158*
Sample Date:					*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*
Sample Depth:					*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	-	-	-	-	0.0002 U
Acetophenone	-	0.15	-	-	-	-	-	-	0.001 U
Anthracene	-	0.13	-	-	-	-	-	-	0.0002 U
Atrazine	0.003	0.00026	-	-	-	-	-	-	0.001 U
Benzaldehyde	-	0.150	-	-	-	-	-	-	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	-	-	-	-	0.001 U
bis(2-Chloroethoxy)methane	-	0.0046	-	-	-	-	-	-	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	-	-	-	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	-	-	-	0.001 U
Caprolactam	-	0.77	-	-	-	-	-	-	0.005 U
Carbazole	-	-	-	-	-	-	-	-	0.001 U
Chrysene	-	0.0029	-	-	-	-	-	-	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	0.0002 U
Dibenzofuran	-	0.00058	-	-	-	-	-	-	0.001 U
Diethyl phthalate	-	1.1	-	-	-	-	-	-	0.001 U
Dimethyl phthalate	-	-	-	-	-	-	-	-	0.001 U
Di-n-butylphthalate (DBP)	-	0.067	-	-	-	-	-	-	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	-	-	-	-	0.001 U
Fluoranthene	-	0.063	-	-	-	-	-	-	0.0002 U
Fluorene	-	0.022	-	-	-	-	-	-	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	-	-	-	-	0.001 U
Hexachlorocyclopentadiene	0.05	0.0022	-	-	-	-	-	-	0.01 U
Hexachloroethane	-	0.00051	-	-	-	-	-	-	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	0.0002 U
Isophorone	-	0.067	-	-	-	-	-	-	0.001 U
Naphthalene	-	0.00014	4.02	20.11	-	-	-	-	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	-	-	-	-	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	-	-	-	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	-	-	-	-	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	-	-	-	-	0.005 U
Phenanthrene	-	-	-	-	-	-	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:					*GW-38443-120308-DD-154*	*GW-38443-120308-DD-155*	*GW-38443-120308-DD-156*	*GW-38443-120308-DD-157*	*GW-38443-120308-DD-158*
Sample Date:					*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*
Sample Depth:					*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	-	-	-	-	0.001 U
Pyrene	-	0.0087	-	-	-	-	-	-	0.0002 U
Metals									
Arsenic	0.01	0.000045			**0.0171[ab]**	**0.0165[ab]**	**0.0131[ab]**	**0.0174[ab]**	**0.0125[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	-	-
Lead	0.015	-	-	-	0.0141	0.0123	0.0083	0.0132	0.0066
Lead (dissolved)	0.015	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121508-DD-189*	*GW-38443-121508-DD-190*	*GW-38443-121508-DD-191*	*GW-38443-121508-DD-192*	*GW-38443-121508-DD-193*
Sample Date:					*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*
Sample Depth:					*17-22 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.00043 J	0.001 U	0.001 U	0.00022 J	0.00022 J
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetone	-	1.2	2236	9784	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cyclohexane	-	1.3	0.103	0.42	0.00014 J	0.0002 J	0.00018 J	0.0002 J	0.00017 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121508-DD-189*	*GW-38443-121508-DD-190*	*GW-38443-121508-DD-191*	*GW-38443-121508-DD-192*	*GW-38443-121508-DD-193*
Sample Date:					*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*
Sample Depth:					*17-22 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.0023	0.0016	0.0012	0.00082 J	0.0009 J
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	**0.00027 J[bc]**	**0.00091 J[bc]**	**0.00068 J[bc]**	**0.04[abcd]**	**0.04[abcd]**
Xylenes (total)	10	0.019	0.047	0.21	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	0.001 U	0.001 U	-	-	-
2,4,5-Trichlorophenol	-	0.089	-	-	0.005 U	0.005 U	-	-	-
2,4,6-Trichlorophenol	-	0.0009	-	-	0.005 U	0.005 U	-	-	-
2,4-Dichlorophenol	-	0.0035	-	-	0.002 U	0.002 U	-	-	-
2,4-Dimethylphenol	-	0.027	-	-	0.002 U	0.002 U	-	-	-
2,4-Dinitrophenol	-	0.003	-	-	0.005 U	0.005 U	-	-	-
2,4-Dinitrotoluene	-	0.0002	-	-	0.005 U	0.005 U	-	-	-
2,6-Dinitrotoluene	-	0.000042	-	-	0.005 U	0.005 U	-	-	-
2-Chloronaphthalene	-	0.055	-	-	0.001 U	0.001 U	-	-	-
2-Chlorophenol	-	0.0071	-	-	0.001 U	0.001 U	-	-	-
2-Methylnaphthalene	-	0.0027	-	-	0.0002 U	0.0002 U	-	-	-
2-Methylphenol	-	0.072	-	-	0.001 U	0.001 U	-	-	-
2-Nitroaniline	-	0.015	-	-	0.002 U	0.002 U	-	-	-
2-Nitrophenol	-	-	-	-	0.002 U	0.002 U	-	-	-
3,3'-Dichlorobenzidine	-	0.00011	-	-	0.005 U	0.005 U	-	-	-
3-Nitroaniline	-	-	-	-	0.002 U	0.002 U	-	-	-
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	0.005 U	0.005 U	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-
4-Chloro-3-methylphenol	-	0.11	-	-	0.002 U	0.002 U	-	-	-
4-Chloroaniline	-	0.00032	-	-	0.002 U	0.002 U	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-
4-Methylphenol	-	0.14	-	-	0.001 U	0.001 U	-	-	-
4-Nitroaniline	-	0.003	-	-	0.002 U	0.002 U	-	-	-
4-Nitrophenol	-	-	-	-	0.005 U	0.005 U	-	-	-
Acenaphthene	-	0.04	-	-	0.0002 U	0.00021	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121508-DD-189*	*GW-38443-121508-DD-190*	*GW-38443-121508-DD-191*	*GW-38443-121508-DD-192*	*GW-38443-121508-DD-193*
Sample Date:					*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*
Sample Depth:					*17-22 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-
Acetophenone	-	0.15	-	-	0.001 U	0.001 U	-	-	-
Anthracene	-	0.13	-	-	0.0002 U	0.00021	-	-	-
Atrazine	0.003	0.00026	-	-	0.001 U	0.001 U	-	-	-
Benzaldehyde	-	0.150	-	-	0.001 U	0.001 U	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	0.0002 U	**0.00057**[b]	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	0.0002 U	**0.0011**[ab]	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	0.0002 U	**0.0011**[b]	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.0002 U	0.00029	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	0.0002 U	**0.00033**[b]	-	-	-
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	0.001 U	0.001 U	-	-	-
bis(2-Chloroethoxy)methane	-	0.0046	-	-	0.001 U	0.001 U	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	0.001 U	0.001 U	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	0.002 U	0.002 U	-	-	-
Butyl benzylphthalate (BBP)	-	0.014	-	-	0.001 U	0.001 U	-	-	-
Caprolactam	-	0.77	-	-	0.005 UJ	0.005 UJ	-	-	-
Carbazole	-	-	-	-	0.001 U	0.001 U	-	-	-
Chrysene	-	0.0029	-	-	0.0002 U	0.00055	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-
Dibenzofuran	-	0.00058	-	-	0.001 U	0.001 U	-	-	-
Diethyl phthalate	-	1.1	-	-	0.001 U	0.001 U	-	-	-
Dimethyl phthalate	-	-	-	-	0.001 U	0.001 U	-	-	-
Di-n-butylphthalate (DBP)	-	0.067	-	-	0.001 U	0.001 U	-	-	-
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	0.001 U	0.001 U	-	-	-
Fluoranthene	-	0.063	-	-	0.0002 U	0.0011	-	-	-
Fluorene	-	0.022	-	-	0.0002 U	0.0002 U	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	0.0002 U	0.0002 U	-	-	-
Hexachlorobutadiene	-	0.00026	-	-	0.001 U	0.001 U	-	-	-
Hexachlorocyclopentadiene	0.05	0.0022	-	-	0.01 U	0.01 U	-	-	-
Hexachloroethane	-	0.00051	-	-	0.001 U	0.001 U	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	0.0002 U	**0.00024**[b]	-	-	-
Isophorone	-	0.067	-	-	0.001 U	0.001 U	-	-	-
Naphthalene	-	0.00014	4.02	20.11	0.0002 U	0.0002 U	-	-	-
Nitrobenzene	-	0.00012	62.18	316.00	0.001 U	0.001 U	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	0.001 U	0.001 U	-	-	-
N-Nitrosodiphenylamine	-	0.01	-	-	0.001 U	0.001 U	-	-	-
Pentachlorophenol	0.001	0.000035	-	-	0.005 U	0.005 U	-	-	-
Phenanthrene	-	-	-	-	0.0002 U	0.00074	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121508-DD-189*	*GW-38443-121508-DD-190*	*GW-38443-121508-DD-191*	*GW-38443-121508-DD-192*	*GW-38443-121508-DD-193*
Sample Date:					*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*
Sample Depth:					*17-22 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	0.001 U	0.001 U	-	-	-
Pyrene	-	0.0087	-	-	0.0002 U	0.00091	-	-	-
Metals									
Arsenic	0.01	0.000045			**0.0662[ab]**	**0.049[ab]**	**0.0158[ab]**	**0.0526[ab]**	**0.0153[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	**0.0032 J[b]**	-
Lead	0.015	-	-	-	**0.18[a]**	**0.226[a]**	**0.0666[a]**	**0.142[a]**	**0.0386[a]**
Lead (dissolved)	0.015	-	-	-	-	-	-	0.001 U	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-194*	*GW-38443-121608-DD-195*	*GW-38443-121608-DD-196*	*GW-38443-121608-DD-197*	*GW-38443-121608-DD-198*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*47-52 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*
	USEPA Regional Screening Levels [1]					*Duplicate*			
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.005 U	0.0067 U	0.0067 U	0.0015 J	0.0014 J
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.01 U	0.013 U	0.013 U	0.0067 U	0.004 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,3-Dichlorobenzene	-	-	-	-	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.05 U	0.067 U	0.067 U	0.033 U	0.02 U
2-Hexanone	-	0.0034	0.81	3.4	0.05 U	0.067 U	0.067 U	0.033 U	0.02 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.05 U	0.067 U	0.067 U	0.033 U	0.02 U
Acetone	-	1.2	2236	9784	0.05 U	0.067 U	0.067 U	0.033 U	0.02 U
Benzene	0.005	0.00039	0.0014	0.0071	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Bromoform	0.080	0.008	-	-	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Carbon disulfide	-	0.072	0.12	0.53	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Chloroethane	0.000	2.1	2.2	9.7	0.005 U	0.0067 U	0.0067 U	0.0033 U	**0.0007 J[a]**
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	**0.0049 J[b]**	**0.0052 J[b]**	**0.0051 J[b]**	**0.031[b]**	**0.03[b]**
cis-1,3-Dichloropropene	-	-	-	-	0.005 U	0.0067 UJ	0.0067 UJ	0.0033 UJ	0.002 U
Cyclohexane	-	1.3	0.103	0.42	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.005 U	0.0067 UJ	0.0067 UJ	0.0033 UJ	0.002 U
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Isopropyl benzene	-	0.039	0.089	0.38	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Methyl acetate	-	1.6	-	-	0.05 U	0.067 U	0.067 U	0.033 U	0.02 U
Methyl cyclohexane	-	-	-	-	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.025 U	0.033 U	0.033 U	0.017 U	0.01 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-194*	*GW-38443-121608-DD-195*	*GW-38443-121608-DD-196*	*GW-38443-121608-DD-197*	*GW-38443-121608-DD-198*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*47-52 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*
	USEPA Regional Screening Levels [1]					*Duplicate*			
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Styrene	0.100	0.110	0.89	3.91	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Toluene	1.000	0.086	1.9	8.1	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.00061 J
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
trans-1,3-Dichloropropene	-	-	-	-	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.005 U	0.0067 U	0.0067 U	0.0033 U	0.002 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	**0.14[abcd]**	**0.14[abcd]**	**0.15[abcd]**	**0.088[abcd]**	**0.065 J[abcd]**
Xylenes (total)	10	0.019	0.047	0.21	0.01 U	0.013 U	0.013 U	0.0067 U	0.004 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	-	-	-	0.001 U
2,4,5-Trichlorophenol	-	0.089	-	-	-	-	-	-	0.005 U
2,4,6-Trichlorophenol	-	0.0009	-	-	-	-	-	-	0.005 U
2,4-Dichlorophenol	-	0.0035	-	-	-	-	-	-	0.002 U
2,4-Dimethylphenol	-	0.027	-	-	-	-	-	-	0.002 U
2,4-Dinitrophenol	-	0.003	-	-	-	-	-	-	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	-	-	-	-	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	-	-	-	-	0.005 U
2-Chloronaphthalene	-	0.055	-	-	-	-	-	-	0.001 U
2-Chlorophenol	-	0.0071	-	-	-	-	-	-	0.001 U
2-Methylnaphthalene	-	0.0027	-	-	-	-	-	-	0.0002 U
2-Methylphenol	-	0.072	-	-	-	-	-	-	0.001 U
2-Nitroaniline	-	0.015	-	-	-	-	-	-	0.002 U
2-Nitrophenol	-	-	-	-	-	-	-	-	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	-	-	-	0.005 U
3-Nitroaniline	-	-	-	-	-	-	-	-	0.002 U
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	-	-	-	-	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	0.002 U
4-Chloro-3-methylphenol	-	0.11	-	-	-	-	-	-	0.002 U
4-Chloroaniline	-	0.00032	-	-	-	-	-	-	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	0.002 U
4-Methylphenol	-	0.14	-	-	-	-	-	-	0.001 U
4-Nitroaniline	-	0.003	-	-	-	-	-	-	0.002 U
4-Nitrophenol	-	-	-	-	-	-	-	-	0.005 U
Acenaphthene	-	0.04	-	-	-	-	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-194*	*GW-38443-121608-DD-195*	*GW-38443-121608-DD-196*	*GW-38443-121608-DD-197*	*GW-38443-121608-DD-198*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*47-52 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*
	USEPA Regional Screening Levels [1]					*Duplicate*			
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	-	-	-	-	0.0002 U
Acetophenone	-	0.15	-	-	-	-	-	-	0.001 U
Anthracene	-	0.13	-	-	-	-	-	-	0.0002 U
Atrazine	0.003	0.00026	-	-	-	-	-	-	0.001 U
Benzaldehyde	-	0.150	-	-	-	-	-	-	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	-	-	-	-	0.001 U
bis(2-Chloroethoxy)methane	-	0.0046	-	-	-	-	-	-	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	-	-	-	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	-	-	-	0.001 U
Caprolactam	-	0.77	-	-	-	-	-	-	0.005 UJ
Carbazole	-	-	-	-	-	-	-	-	0.001 U
Chrysene	-	0.0029	-	-	-	-	-	-	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	0.0002 U
Dibenzofuran	-	0.00058	-	-	-	-	-	-	0.001 U
Diethyl phthalate	-	1.1	-	-	-	-	-	-	0.001 U
Dimethyl phthalate	-	-	-	-	-	-	-	-	0.001 U
Di-n-butylphthalate (DBP)	-	0.067	-	-	-	-	-	-	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	-	-	-	-	0.001 U
Fluoranthene	-	0.063	-	-	-	-	-	-	0.0002 U
Fluorene	-	0.022	-	-	-	-	-	-	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	-	-	-	-	0.001 U
Hexachlorocyclopentadiene	0.05	0.0022	-	-	-	-	-	-	0.01 U
Hexachloroethane	-	0.00051	-	-	-	-	-	-	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	0.0002 U
Isophorone	-	0.067	-	-	-	-	-	-	0.001 U
Naphthalene	-	0.00014	4.02	20.11	-	-	-	-	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	-	-	-	-	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	-	-	-	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	-	-	-	-	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	-	-	-	-	0.005 U
Phenanthrene	-	-	-	-	-	-	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-194*	*GW-38443-121608-DD-195*	*GW-38443-121608-DD-196*	*GW-38443-121608-DD-197*	*GW-38443-121608-DD-198*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*47-52 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*
	USEPA Regional Screening Levels [1]					*Duplicate*			
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	-	-	-	-	0.001 U
Pyrene	-	0.0087	-	-	-	-	-	-	0.0002 U
Metals									
Arsenic	0.01	0.000045			**0.0196[ab]**	**0.0304[ab]**	**0.0202[ab]**	**0.0254[ab]**	**0.022[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	**0.003 J[b]**	-
Lead	0.015	-	-	-	**0.0494[a]**	**0.066[a]**	**0.0497[a]**	**0.0622[a]**	**0.0465[a]**
Lead (dissolved)	0.015	-	-	-	-	-	-	0.001 U	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-199*	*GW-38443-121608-DD-200*	*GW-38443-121608-DD-201*	*GW-38443-121608-DD-202*	*GW-38443-121608-DD-203*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.0018	0.0021	0.003[b]	0.0023	0.0012
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.00032 J[b]	0.00025 J[b]	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetone	-	1.2	2236	9784	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.00038 J[a]	0.00036 J[a]	0.001 U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.019[b]	0.019[b]	0.012[b]	0.0077[b]	0.0034[b]
cis-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cyclohexane	-	1.3	0.103	0.42	0.00026 J	0.0002 J	0.00017 J	0.0002 J	0.00018 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-199*	*GW-38443-121608-DD-200*	*GW-38443-121608-DD-201*	*GW-38443-121608-DD-202*	*GW-38443-121608-DD-203*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.00067 J	0.00053 J	0.00044 J	0.00053 J	0.00047 J
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	**0.028[abcd]**	**0.024[abcd]**	**0.012[abcd]**	**0.012[abcd]**	**0.012[abcd]**
Xylenes (total)	10	0.019	0.047	0.21	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	0.089	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	0.0009	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	0.0035	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	0.027	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	0.003	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.0002	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	0.000042	-	-	-	-	-	-	-
2-Chloronaphthalene	-	0.055	-	-	-	-	-	-	-
2-Chlorophenol	-	0.0071	-	-	-	-	-	-	-
2-Methylnaphthalene	-	0.0027	-	-	-	-	-	-	-
2-Methylphenol	-	0.072	-	-	-	-	-	-	-
2-Nitroaniline	-	0.015	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	0.11	-	-	-	-	-	-	-
4-Chloroaniline	-	0.00032	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	0.14	-	-	-	-	-	-	-
4-Nitroaniline	-	0.003	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-
Acenaphthene	-	0.04	-	-	-	-	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-199*	*GW-38443-121608-DD-200*	*GW-38443-121608-DD-201*	*GW-38443-121608-DD-202*	*GW-38443-121608-DD-203*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	-	-	-	-	-
Acetophenone	-	0.15	-	-	-	-	-	-	-
Anthracene	-	0.13	-	-	-	-	-	-	-
Atrazine	0.003	0.00026	-	-	-	-	-	-	-
Benzaldehyde	-	0.150	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	0.0046	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	-	-	-	-
Caprolactam	-	0.77	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-
Chrysene	-	0.0029	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	-
Dibenzofuran	-	0.00058	-	-	-	-	-	-	-
Diethyl phthalate	-	1.1	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	0.067	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	-	-	-	-	-
Fluoranthene	-	0.063	-	-	-	-	-	-	-
Fluorene	-	0.022	-	-	-	-	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.00026	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	0.05	0.0022	-	-	-	-	-	-	-
Hexachloroethane	-	0.00051	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	-
Isophorone	-	0.067	-	-	-	-	-	-	-
Naphthalene	-	0.00014	4.02	20.11	-	-	-	-	-
Nitrobenzene	-	0.00012	62.18	316.00	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	0.01	-	-	-	-	-	-	-
Pentachlorophenol	0.001	0.000035	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:					*GW-38443-121608-DD-199*	*GW-38443-121608-DD-200*	*GW-38443-121608-DD-201*	*GW-38443-121608-DD-202*	*GW-38443-121608-DD-203*
Sample Date:					*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:					*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	-	-	-	-	-
Pyrene	-	0.0087	-	-	-	-	-	-	-
Metals									
Arsenic	0.01	0.000045			**0.012[ab]**	**0.0153[ab]**	**0.0376[ab]**	**0.0295[ab]**	**0.0217[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	**0.0044 J[b]**	-
Lead	0.015	-	-	-	**0.0343[a]**	**0.0317[a]**	**0.0808[a]**	**0.0682[a]**	**0.0744[a]**
Lead (dissolved)	0.015	-	-	-	-	-	-	0.001 U	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*
Sample ID:					*GW-38443-121608-DD-204*	*GW-38443-011109-KMV-229*	*GW-38443-011109-KMV-230*	*GW-38443-011109-KMV-231*	*GW-38443-011109-KMV-232*
Sample Date:					*12/16/2008*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*
Sample Depth:					*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.00093 J	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Acetone	-	1.2	2236	9784	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	**0.00045 J[b]**	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 U	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	**0.0029[b]**	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Cyclohexane	-	1.3	0.103	0.42	0.0002 J	0.00044 J	0.00047 J	0.00049 J	0.00035 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 U	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.001 U	0.00045 J	0.00039 J	0.00047 J	0.00032 J
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.00071 J	0.00061 J	0.00068 J	0.00053 J
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*
Sample ID:					*GW-38443-121608-DD-204*	*GW-38443-011109-KMV-229*	*GW-38443-011109-KMV-230*	*GW-38443-011109-KMV-231*	*GW-38443-011109-KMV-232*
Sample Date:					*12/16/2008*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*
Sample Depth:					*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.0005 J	0.0018	0.0017	0.0018	0.0013
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 U	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Vinyl chloride	0.002	0.000015	0.00014	0.0025	**0.011**[abcd]	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Xylenes (total)	10	0.019	0.047	0.21	0.002 U	0.00078 J	0.00075 J	0.00078 J	0.00056 J
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	0.001 UJ	0.001 U	-	-	-
2,4,5-Trichlorophenol	-	0.089	-	-	0.005 U	0.005 U	-	-	-
2,4,6-Trichlorophenol	-	0.0009	-	-	0.005 U	0.005 U	-	-	-
2,4-Dichlorophenol	-	0.0035	-	-	0.002 U	0.002 U	-	-	-
2,4-Dimethylphenol	-	0.027	-	-	0.002 U	0.002 U	-	-	-
2,4-Dinitrophenol	-	0.003	-	-	0.005 U	0.005 U	-	-	-
2,4-Dinitrotoluene	-	0.0002	-	-	0.005 U	0.005 U	-	-	-
2,6-Dinitrotoluene	-	0.000042	-	-	0.005 U	0.005 U	-	-	-
2-Chloronaphthalene	-	0.055	-	-	0.001 U	0.001 U	-	-	-
2-Chlorophenol	-	0.0071	-	-	0.001 U	0.001 U	-	-	-
2-Methylnaphthalene	-	0.0027	-	-	0.0002 U	0.0002 U	-	-	-
2-Methylphenol	-	0.072	-	-	0.001 U	0.001 U	-	-	-
2-Nitroaniline	-	0.015	-	-	0.002 UJ	0.002 U	-	-	-
2-Nitrophenol	-	-	-	-	0.002 U	0.002 U	-	-	-
3,3'-Dichlorobenzidine	-	0.00011	-	-	0.005 U	0.005 U	-	-	-
3-Nitroaniline	-	-	-	-	0.002 U	0.002 U	-	-	-
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	0.005 U	0.005 U	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-
4-Chloro-3-methylphenol	-	0.11	-	-	0.002 U	0.002 U	-	-	-
4-Chloroaniline	-	0.00032	-	-	0.002 U	0.002 U	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-
4-Methylphenol	-	0.14	-	-	0.001 U	0.001 U	-	-	-
4-Nitroaniline	-	0.003	-	-	0.002 U	0.002 U	-	-	-
4-Nitrophenol	-	-	-	-	0.005 U	0.005 U	-	-	-
Acenaphthene	-	0.04	-	-	0.0002 U	0.0002 U	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*
Sample ID:					*GW-38443-121608-DD-204*	*GW-38443-011109-KMV-229*	*GW-38443-011109-KMV-230*	*GW-38443-011109-KMV-231*	*GW-38443-011109-KMV-232*
Sample Date:					*12/16/2008*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*
Sample Depth:					*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-
Acetophenone	-	0.15	-	-	0.001 U	0.001 U	-	-	-
Anthracene	-	0.13	-	-	0.0002 U	0.0002 U	-	-	-
Atrazine	0.003	0.00026	-	-	0.001 U	0.001 U	-	-	-
Benzaldehyde	-	0.150	-	-	0.001 U	0.001 U	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	0.0002 U	0.0002 U	-	-	-
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	0.001 U	0.001 U	-	-	-
bis(2-Chloroethoxy)methane	-	0.0046	-	-	0.001 U	0.001 U	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	0.001 U	0.001 U	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	0.002 U	0.002 U	-	-	-
Butyl benzylphthalate (BBP)	-	0.014	-	-	0.001 U	0.001 U	-	-	-
Caprolactam	-	0.77	-	-	0.005 UJ	0.005 UJ	-	-	-
Carbazole	-	-	-	-	0.001 U	0.001 U	-	-	-
Chrysene	-	0.0029	-	-	0.0002 U	0.0002 U	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-
Dibenzofuran	-	0.00058	-	-	0.001 U	0.001 U	-	-	-
Diethyl phthalate	-	1.1	-	-	0.001 U	0.001 U	-	-	-
Dimethyl phthalate	-	-	-	-	0.001 U	0.001 U	-	-	-
Di-n-butylphthalate (DBP)	-	0.067	-	-	0.001 U	0.001 U	-	-	-
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	0.001 U	0.001 U	-	-	-
Fluoranthene	-	0.063	-	-	0.0002 U	0.0002 U	-	-	-
Fluorene	-	0.022	-	-	0.0002 U	0.0002 U	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	0.0002 U	0.0002 U	-	-	-
Hexachlorobutadiene	-	0.00026	-	-	0.001 U	0.001 U	-	-	-
Hexachlorocyclopentadiene	0.05	0.0022	-	-	0.01 U	0.01 U	-	-	-
Hexachloroethane	-	0.00051	-	-	0.001 U	0.001 U	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-
Isophorone	-	0.067	-	-	0.001 U	0.001 U	-	-	-
Naphthalene	-	0.00014	4.02	20.11	0.0002 U	0.0002 U	-	-	-
Nitrobenzene	-	0.00012	62.18	316.00	0.001 UJ	0.001 U	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	0.001 U	0.001 U	-	-	-
N-Nitrosodiphenylamine	-	0.01	-	-	0.001 U	0.001 U	-	-	-
Pentachlorophenol	0.001	0.000035	-	-	0.005 U	0.005 U	-	-	-
Phenanthrene	-	-	-	-	0.0002 U	0.0002 U	-	-	-

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-19*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*
Sample ID:					*GW-38443-121608-DD-204*	*GW-38443-011109-KMV-229*	*GW-38443-011109-KMV-230*	*GW-38443-011109-KMV-231*	*GW-38443-011109-KMV-232*
Sample Date:					*12/16/2008*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*
Sample Depth:					*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels [1]								
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	0.001 U	0.001 U	-	-	-
Pyrene	-	0.0087	-	-	0.0002 U	0.0002 U	-	-	-
Metals									
Arsenic	0.01	0.000045			**0.0222[ab]**	**0.0344[ab]**	**0.129[ab]**	**0.0608[ab]**	**0.0463[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	-	-
Lead	0.015	-	-	-	**0.0661[a]**	**0.0298[a]**	**0.0989[a]**	**0.0461[a]**	**0.0456[a]**
Lead (dissolved)	0.015	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-22*
Sample ID:					*GW-38443-011109-KMV-233*	*GW-38443-011109-KMV-234*	*GW-38443-011109-KMV-235*	*GW-38443-011109-KMV-236*	*GW-38443-121808-DD-205*
Sample Date:					*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*12/18/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*27-32 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.001 U	0.001 U	0.00078 J	0.00087 J	0.001
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U
Acetone	-	1.2	2236	9784	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.0006 J
cis-1,3-Dichloropropene	-	-	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Cyclohexane	-	1.3	0.103	0.42	0.00032 J	0.00014 J	0.00029 J	0.00033 J	0.00014 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 U
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.00032 J	0.001 U	0.00026 J	0.00032 J	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-22*
Sample ID:					*GW-38443-011109-KMV-233*	*GW-38443-011109-KMV-234*	*GW-38443-011109-KMV-235*	*GW-38443-011109-KMV-236*	*GW-38443-121808-DD-205*
Sample Date:					*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*12/18/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*27-32 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.0014	0.00059 J	0.0017	0.0012	0.0038
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	**0.00066 J[bc]**
Xylenes (total)	10	0.019	0.047	0.21	0.00051 J	0.002 U	0.00072 J	0.00062 J	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	0.001 U	-	0.001 U	0.001 U
2,4,5-Trichlorophenol	-	0.089	-	-	-	0.005 U	-	0.005 U	0.005 U
2,4,6-Trichlorophenol	-	0.0009	-	-	-	0.005 U	-	0.005 U	0.005 U
2,4-Dichlorophenol	-	0.0035	-	-	-	0.002 U	-	0.002 U	0.002 U
2,4-Dimethylphenol	-	0.027	-	-	-	0.002 U	-	0.002 U	0.002 U
2,4-Dinitrophenol	-	0.003	-	-	-	0.005 U	-	0.005 U	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	-	0.005 U	-	0.005 U	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	-	0.005 U	-	0.005 U	0.005 U
2-Chloronaphthalene	-	0.055	-	-	-	0.001 U	-	0.001 U	0.001 U
2-Chlorophenol	-	0.0071	-	-	-	0.001 U	-	0.001 U	0.001 U
2-Methylnaphthalene	-	0.0027	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
2-Methylphenol	-	0.072	-	-	-	0.001 U	-	0.001 U	0.001 U
2-Nitroaniline	-	0.015	-	-	-	0.002 U	-	0.002 U	0.002 U
2-Nitrophenol	-	-	-	-	-	0.002 U	-	0.002 U	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	0.005 U	-	0.005 U	0.005 U
3-Nitroaniline	-	-	-	-	-	0.002 U	-	0.002 U	0.002 U
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	-	0.005 U	-	0.005 U	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	-	0.002 U	-	0.002 U	0.002 U
4-Chloro-3-methylphenol	-	0.11	-	-	-	0.002 U	-	0.002 U	0.002 U
4-Chloroaniline	-	0.00032	-	-	-	0.002 U	-	0.002 U	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	0.002 U	-	0.002 U	0.002 U
4-Methylphenol	-	0.14	-	-	-	0.001 U	-	0.001 U	0.001 U
4-Nitroaniline	-	0.003	-	-	-	0.002 U	-	0.002 U	0.002 U
4-Nitrophenol	-	-	-	-	-	0.005 U	-	0.005 U	0.005 U
Acenaphthene	-	0.04	-	-	-	0.0002 U	-	0.0002 U	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-22*
Sample ID:					*GW-38443-011109-KMV-233*	*GW-38443-011109-KMV-234*	*GW-38443-011109-KMV-235*	*GW-38443-011109-KMV-236*	*GW-38443-121808-DD-205*
Sample Date:					*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*12/18/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*27-32 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Acetophenone	-	0.15	-	-	-	0.001 U	-	0.001 U	0.001 U
Anthracene	-	0.13	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Atrazine	0.003	0.00026	-	-	-	0.001 U	-	0.001 U	0.001 U
Benzaldehyde	-	0.150	-	-	-	0.001 U	-	0.001 U	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	-	0.001 U	-	0.001 U	0.001 U
bis(2-Chloroethoxy)methane	-	0.0046	-	-	-	0.001 U	-	0.001 U	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	0.001 U	-	0.001 U	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	0.0033	-	**0.0079**[ab]	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	0.001 U	-	0.001 U	0.001 U
Caprolactam	-	0.77	-	-	-	0.005 UJ	-	0.005 UJ	0.005 U
Carbazole	-	-	-	-	-	0.001 U	-	0.001 U	0.001 U
Chrysene	-	0.0029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Dibenzofuran	-	0.00058	-	-	-	0.001 U	-	0.001 U	0.001 U
Diethyl phthalate	-	1.1	-	-	-	0.001 U	-	0.001 U	0.001 U
Dimethyl phthalate	-	-	-	-	-	0.001 U	-	0.001 U	0.001 U
Di-n-butylphthalate (DBP)	-	0.067	-	-	-	0.001 U	-	0.001 U	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	-	0.001 U	-	0.001 U	0.001 U
Fluoranthene	-	0.063	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Fluorene	-	0.022	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	-	0.001 U	-	0.001 U	0.001 U
Hexachlorocyclopentadiene	0.05	0.0022	-	-	-	0.01 U	-	0.01 U	0.01 U
Hexachloroethane	-	0.00051	-	-	-	0.001 U	-	0.001 U	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Isophorone	-	0.067	-	-	-	0.001 U	-	0.001 U	0.001 U
Naphthalene	-	0.00014	4.02	20.11	-	0.0002 U	-	0.0002 U	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	-	0.001 U	-	0.001 U	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	0.001 U	-	0.001 U	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	-	0.001 U	-	0.001 U	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	-	0.005 U	-	0.005 U	0.005 U
Phenanthrene	-	-	-	-	-	0.0002 U	-	0.0002 U	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-22*
Sample ID:					*GW-38443-011109-KMV-233*	*GW-38443-011109-KMV-234*	*GW-38443-011109-KMV-235*	*GW-38443-011109-KMV-236*	*GW-38443-121808-DD-205*
Sample Date:					*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*12/18/2008*
Sample Depth:					*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*27-32 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	-	0.001 U	-	0.001 U	0.001 U
Pyrene	-	0.0087	-	-	-	0.0002 U	-	0.0002 U	0.0002 U
Metals									
Arsenic	0.01	0.000045			**0.0313[ab]**	**0.0086[b]**	**0.0868[ab]**	**0.0235[ab]**	**0.127[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	-	-	-
Lead	0.015	-	-	-	**0.0302[a]**	0.0067	**0.0866[a]**	**0.0224[a]**	**0.309[a]**
Lead (dissolved)	0.015	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*
Sample ID:					*GW-38443-121808-DD-206*	*GW-38443-121808-DD-207*	*GW-38443-121808-DD-208*	*GW-38443-121808-DD-209*	*GW-38443-121808-DD-210*
Sample Date:					*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*
Sample Depth:					*27-32 ft BGS*	*32-37 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Volatiles									
1,1,1-Trichloroethane	0.2	0.75	0.74	3.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane		0.000066	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U
1,1,2-Trichloroethane	0.005	0.00004	0.00062	0.0026	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U
1,1-Dichloroethane		0.0024	0.0065	0.034	0.00094 J	0.0011	0.00037 J	0.0005 J	0.00045 J
1,1-Dichloroethene	0.007	0.026	0.020	0.082	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00039	0.0036	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.000007	0.00015	0.00075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.028	0.27	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.49	224	946	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.0034	0.81	3.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	0.1	55	230	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetone	-	1.2	2236	9784	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.080	0.00012	0.00076	0.0038	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.080	0.008	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.001	0.0017	0.0073	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	-	0.072	0.12	0.53	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.100	0.0072	0.041	0.173	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	0.000	2.1	2.2	9.7	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.080	0.00019	0.00073	0.0035	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	0.000	0.019	0.026	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.070	0.0028	-	-	0.00053 J	0.00058 J	0.001 U	0.00087 J	0.00098 J
cis-1,3-Dichloropropene	-	-	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Cyclohexane	-	1.3	0.103	0.42	0.00018 J	0.00021 J	0.001 U	0.0002 J	0.00017 J
Dibromochloromethane	0.080	0.00015	0.0028	0.014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.019	0.0007	0.0031	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	0.700	0.0013	0.0030	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.039	0.089	0.38	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	1.6	-	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*
Sample ID:					*GW-38443-121808-DD-206*	*GW-38443-121808-DD-207*	*GW-38443-121808-DD-208*	*GW-38443-121808-DD-209*	*GW-38443-121808-DD-210*
Sample Date:					*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*
Sample Depth:					*27-32 ft BGS*	*32-37 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Methylene chloride	0.005	0.0084	0.47	1.96	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.100	0.110	0.89	3.91	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.004	0.0058	0.025	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U
Toluene	1.000	0.086	1.9	8.1	0.0032	0.0062	0.0022	0.001	0.0014
trans-1,2-Dichloroethene	0.100	0.0086	0.038	0.16	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U
Trichloroethene	0.005	0.00026	0.00052	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	0.110	0.018	0.078	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	5.3	0.14	0.60	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	**0.00058 J[bc]**	**0.00075 J[bc]**	**0.00035 J[bc]**	**0.00064 J[bc]**	**0.00071 J[bc]**
Xylenes (total)	10	0.019	0.047	0.21	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	0.001 U	0.001 U	-	-	0.001 U
2,4,5-Trichlorophenol	-	0.089	-	-	0.005 U	0.005 U	-	-	0.005 U
2,4,6-Trichlorophenol	-	0.0009	-	-	0.005 U	0.005 U	-	-	0.005 U
2,4-Dichlorophenol	-	0.0035	-	-	0.002 U	0.002 U	-	-	0.002 U
2,4-Dimethylphenol	-	0.027	-	-	0.002 U	0.002 U	-	-	0.002 U
2,4-Dinitrophenol	-	0.003	-	-	0.005 U	0.005 U	-	-	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	0.005 U	0.005 U	-	-	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	0.005 U	0.005 U	-	-	0.005 U
2-Chloronaphthalene	-	0.055	-	-	0.001 U	0.001 U	-	-	0.001 U
2-Chlorophenol	-	0.0071	-	-	0.001 U	0.001 U	-	-	0.001 U
2-Methylnaphthalene	-	0.0027	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
2-Methylphenol	-	0.072	-	-	0.001 U	0.001 U	-	-	0.001 U
2-Nitroaniline	-	0.015	-	-	0.002 U	0.002 U	-	-	0.002 U
2-Nitrophenol	-	-	-	-	0.002 U	0.002 U	-	-	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	0.005 U	0.005 U	-	-	0.005 U
3-Nitroaniline	-	-	-	-	0.002 U	0.002 U	-	-	0.002 U
4,6-Dinitro-2-methylphenol	-	0.00012	-	-	0.005 U	0.005 U	-	-	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	0.002 U
4-Chloro-3-methylphenol	-	0.11	-	-	0.002 U	0.002 U	-	-	0.002 U
4-Chloroaniline	-	0.00032	-	-	0.002 U	0.002 U	-	-	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	0.002 U
4-Methylphenol	-	0.14	-	-	0.001 U	0.001 U	-	-	0.001 U
4-Nitroaniline	-	0.003	-	-	0.002 U	0.002 U	-	-	0.002 U
4-Nitrophenol	-	-	-	-	0.005 U	0.005 U	-	-	0.005 U
Acenaphthene	-	0.04	-	-	0.0002 U	0.0002 U	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*
Sample ID:					*GW-38443-121808-DD-206*	*GW-38443-121808-DD-207*	*GW-38443-121808-DD-208*	*GW-38443-121808-DD-209*	*GW-38443-121808-DD-210*
Sample Date:					*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*
Sample Depth:					*27-32 ft BGS*	*32-37 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Acenaphthylene	-	-	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Acetophenone	-	0.15	-	-	0.001 U	0.001 U	-	-	0.001 U
Anthracene	-	0.13	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Atrazine	0.003	0.00026	-	-	0.001 U	0.001 U	-	-	0.001 U
Benzaldehyde	-	0.150	-	-	0.001 U	0.001 U	-	-	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.000083	3.34	14.29	0.001 U	0.001 U	-	-	0.001 U
bis(2-Chloroethoxy)methane	-	0.0046	-	-	0.001 U	0.001 U	-	-	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	0.001 U	0.001 U	-	-	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	0.002 U	0.002 U	-	-	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	0.001 U	0.001 U	-	-	0.001 U
Caprolactam	-	0.77	-	-	0.005 U	0.005 U	-	-	0.005 U
Carbazole	-	-	-	-	0.001 U	0.001 U	-	-	0.001 U
Chrysene	-	0.0029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Dibenzofuran	-	0.00058	-	-	0.001 U	0.001 U	-	-	0.001 U
Diethyl phthalate	-	1.1	-	-	0.001 U	0.001 U	-	-	0.001 U
Dimethyl phthalate	-	-	-	-	0.001 U	0.001 U	-	-	0.001 U
Di-n-butylphthalate (DBP)	-	0.067	-	-	0.001 U	0.001 U	-	-	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.016	-	-	0.001 U	0.001 U	-	-	0.001 U
Fluoranthene	-	0.063	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Fluorene	-	0.022	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	0.001 U	0.001 U	-	-	0.001 U
Hexachlorocyclopentadiene	0.05	0.0022	-	-	0.01 U	0.01 U	-	-	0.01 U
Hexachloroethane	-	0.00051	-	-	0.001 U	0.001 U	-	-	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Isophorone	-	0.067	-	-	0.001 U	0.001 U	-	-	0.001 U
Naphthalene	-	0.00014	4.02	20.11	0.0002 U	0.0002 U	-	-	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	0.001 U	0.001 U	-	-	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	0.001 U	0.001 U	-	-	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	0.001 U	0.001 U	-	-	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	0.005 U	0.005 U	-	-	0.005 U
Phenanthrene	-	-	-	-	0.0002 U	0.0002 U	-	-	0.0002 U

TABLE B.1

HISTORIC GROUNDWATER VERTICAL AQUIFER SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*
Sample ID:					*GW-38443-121808-DD-206*	*GW-38443-121808-DD-207*	*GW-38443-121808-DD-208*	*GW-38443-121808-DD-209*	*GW-38443-121808-DD-210*
Sample Date:					*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*
Sample Depth:					*27-32 ft BGS*	*32-37 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*
	USEPA Regional Screening Levels [1]				*Duplicate*				
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*					
	a	*b*	*c*	*d*					
Phenol	-	0.45	-	-	0.001 U	0.001 U	-	-	0.001 U
Pyrene	-	0.0087	-	-	0.0002 U	0.0002 U	-	-	0.0002 U
Metals									
Arsenic	0.01	0.000045			**0.132[ab]**	**0.0714[ab]**	**0.174[ab]**	**0.147[ab]**	**0.0495[ab]**
Arsenic (dissolved)	0.01	0.000045			-	-	**0.0063[b]**	-	-
Lead	0.015	-	-	-	**0.325[a]**	**0.183[a]**	**0.451[a]**	**0.342[a]**	**0.11[a]**
Lead (dissolved)	0.015	-	-	-	-	-	0.001 U	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

J - Indicates an estimated value.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*
Sample ID:					*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*GW-38443-091108-NZ-013*	*GW-38443-072109-GL-003*
Sample Date:					*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/11/2008*	*7/21/2009*
Sample Depth:					*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*
	USEPA Regional Screening Levels [1]													
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*										
	a	*b*	*c*	*d*										
Volatiles														
1,1,1-Trichloroethane	0.2	7.5	0.74	3.1	U	U	U	U	U	U	U	U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane	-	0.000066	0.0028	0.014	U	U	U	U	U	U	U	U	0.001 UJ	0.001 UJ
1,1,2-Trichloroethane	0.005	0.00024	0.00062	0.0026	-	-	-	-	-	-	-	-	0.001 U	0.001 U
1,1-Dichloroethane	-	0.0024	0.0065	0.034	U	U	U	U	U	U	U	U	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.26	0.020	0.082	-	-	-	-	-	-	-	-	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00099	0.0036	0.015	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	-	-	-	-	-	-	-	-	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.0000065	0.00015	0.00075	-	-	-	-	-	-	-	-	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.28	0.27	1.1	-	-	-	-	-	-	-	-	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	U	U	U	U	U	U	U	U	0.001 U	0.001 U
1,2-Dichloroethene (total)	-	0.13	-	-	U	U	U	U	U	U	U	U	-	-
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	-	-	-	-	-	-	-	-	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	-	-	-	-	-	-	-	-	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	4.9	224	946	-	-	-	-	-	-	-	-	0.01 U	0.01 U
2-Hexanone	-	0.034	0.81	3.4	-	-	-	-	-	-	-	-	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	1	55	230	-	-	-	-	-	-	-	-	0.01 U	0.01 U
Acetone	-	12	2236	9784	U	U	U	U	U	U	U	U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	U	U	U	U	U	U	U	U	0.001 U	0.001 U
Bromodichloromethane	0.08	0.00012	0.00076	0.0038	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Bromoform	0.08	0.0079	-	-	U	U	U	U	U	U	U	U	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.007	0.0017	0.0073	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Carbon disulfide	-	0.72	0.12	0.53	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Chlorobenzene	0.1	0.072	0.041	0.173	U	U	U	U	U	U	U	U	0.001 U	0.001 U
Chloroethane	-	21	2.2	9.7	U	U	U	U	U	U	U	U	0.001 U	0.001 U
Chloroform (Trichloromethane)	0.08	0.00019	0.00073	0.0035	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Chloromethane (Methyl chloride)	-	0.19	0.026	0.11	-	-	-	-	-	-	-	-	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.07	0.028	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
Cyclohexane	-	13	0.103	0.42	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
Dibromochloromethane	0.08	0.00015	0.0028	0.014	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.19	0.0007	0.0031	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
Ethylbenzene	0.7	0.0013	0.0030	0.015	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Isopropyl benzene	-	0.39	0.089	0.38	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Methyl acetate	-	16	-	-	-	-	-	-	-	-	-	-	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	-	-	-	-	-	-	-	-	0.005 U	0.005 U
Methylene chloride	0.005	0.0099	0.47	1.96	**0.008 B[a]**	**0.051 B[ab]**	U	U	U	U	U	U	0.001 U	0.001 U
Styrene	0.1	1.1	0.89	3.91	U	U	U	U	U	U	U	U	0.001 UJ	0.001 U
Tetrachloroethene	0.005	0.0097	0.0058	0.025	U	U	U	U	U	U	U	U	0.001 U	0.001 U
Toluene	1	0.86	1.9	8.1	0.007	U	U	U	U	U	U	U	0.001 U	0.001 U
trans-1,2-Dichloroethene	0.1	0.086	0.038	0.16	-	-	-	-	-	-	-	-	0.001 U	0.001 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*
Sample ID:					*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*GW-38443-091108-NZ-013*	*GW-38443-072109-GL-003*
Sample Date:					*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/11/2008*	*7/21/2009*
Sample Depth:					*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*
	USEPA Regional Screening Levels [1]													
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*										
	a	*b*	*c*	*d*										
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 UJ
Trichloroethene	0.005	0.00044	0.00052	0.0022	U	U	U	U	U	U	U	U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	1.1	0.018	0.078	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	53	0.14	0.60	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	U	U	U	U	U	U	U	U	**0.00031 J[bc]**	**0.00066 J[bc]**
Xylenes (total)	10	0.19	0.047	0.21	U	U	U	U	U	U	U	U	0.002 U	0.002 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
2,4,5-Trichlorophenol	-	0.89	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
2,4,6-Trichlorophenol	-	0.0035	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
2,4-Dichlorophenol	-	0.035	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
2,4-Dimethylphenol	-	0.27	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
2,4-Dinitrophenol	-	0.03	-	-	-	-	-	-	-	-	-	-	0.005 UJ	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
2-Chloronaphthalene	-	0.55	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
2-Chlorophenol	-	0.071	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
2-Methylnaphthalene	-	0.027	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
2-Methylphenol	-	0.72	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
2-Nitroaniline	-	0.15	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
4,6-Dinitro-2-methylphenol	-	0.0012	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
4-Chloro-3-methylphenol	-	1.1	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
4-Chloroaniline	-	0.00032	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
4-Methylphenol	-	1.4	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
4-Nitroaniline	-	0.0033	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
Acenaphthene	-	0.4	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Acetophenone	-	1.5	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Anthracene	-	1.3	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Atrazine	0.003	0.00026	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Benzaldehyde	-	1.5	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.00083	3.34	14.29	-	-	-	-	-	-	-	-	0.001 U	0.001 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*
Sample ID:					*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*GW-38443-091108-NZ-013*	*GW-38443-072109-GL-003*
Sample Date:					*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/11/2008*	*7/21/2009*
Sample Depth:					*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*
	USEPA Regional Screening Levels [1]													
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*										
	a	*b*	*c*	*d*										
bis(2-Chloroethoxy)methane	-	0.046	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	-	-	-	-	-	-	-	0.001 U	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	-	-	-	-	0.0028 U	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Caprolactam	-	7.7	-	-	-	-	-	-	-	-	-	-	0.0037 J	0.005 U
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Chrysene	-	0.0029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Dibenzofuran	-	0.0058	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Diethyl phthalate	-	11	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Di-n-butylphthalate (DBP)	-	0.67	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.16	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Fluoranthene	-	0.63	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Fluorene	-	0.22	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Hexachlorocyclopentadiene	0.05	0.022	-	-	-	-	-	-	-	-	-	-	R	0.01 U
Hexachloroethane	-	0.00079	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Isophorone	-	0.067	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Naphthalene	-	0.00014	4.02	20.11	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	-	-	-	-	-	-	-	-	0.001 U	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Phenol	-	4.5	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Pyrene	-	0.087	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Metals														
Aluminum	-	16	-	-	-	-	-	-	-	-	-	-	0.162 J	0.152 J
Aluminum (dissolved)	-	16	-	-	-	-	-	-	-	-	-	-	-	0.2 U
Antimony	0.006	0.006	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
Antimony (dissolved)	0.006	0.006	-	-	-	-	-	-	-	-	-	-	-	0.002 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*
Sample ID:					*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*GW-38443-091108-NZ-013*	*GW-38443-072109-GL-003*
Sample Date:					*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/11/2008*	*7/21/2009*
Sample Depth:					*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*
	USEPA Regional Screening Levels [1]													
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*										
	a	*b*	*c*	*d*										
Arsenic	0.01	0.000045	-	-	**0.032[ab]**	-	-	-	-	-	-	-	**0.0042 J[b]**	**0.0044 J[b]**
Arsenic (dissolved)	0.01	0.000045	-	-	-	-	-	-	-	-	-	-	-	**0.004 J[b]**
Barium	2	2.9	-	-	0.63	-	-	-	-	-	-	-	0.163 J	0.136 J
Barium (dissolved)	2	2.9	-	-	-	-	-	-	-	-	-	-	-	0.134 J
Beryllium	0.004	0.016	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
Beryllium (dissolved)	0.004	0.016	-	-	-	-	-	-	-	-	-	-	-	0.005 U
Cadmium	0.005	0.0069	-	-	U	-	-	-	-	-	-	-	0.001 U	0.001 U
Cadmium (dissolved)	0.005	0.0069	-	-	-	-	-	-	-	-	-	-	-	0.001 U
Calcium	-	-	-	-	-	-	-	-	-	-	-	-	77	69.5
Calcium (dissolved)	-	-	-	-	-	-	-	-	-	-	-	-	-	68.8
Chromium	0.1	-	-	-	0.065	-	-	-	-	-	-	-	0.01 U	0.01 U
Chromium (dissolved)	0.1	-	-	-	-	-	-	-	-	-	-	-	-	0.01 U
Cobalt	-	0.0047	-	-	-	-	-	-	-	-	-	-	0.05 U	0.05 U
Cobalt (dissolved)	-	0.0047	-	-	-	-	-	-	-	-	-	-	-	0.05 U
Copper	1.3	0.62	-	-	-	-	-	-	-	-	-	-	0.025 U	0.025 U
Copper (dissolved)	1.3	0.62	-	-	-	-	-	-	-	-	-	-	-	0.025 U
Iron	-	11	-	-	-	-	-	-	-	-	-	-	1.76	1.81
Iron (dissolved)	-	11	-	-	3	-	-	-	-	-	-	-	-	1.36
Lead	0.015	-	-	-	**0.1[a]**	-	-	-	-	-	-	-	0.0004 J	0.00044 J
Lead (dissolved)	0.015	-	-	-	-	-	-	-	-	-	-	-	-	0.001 U
Magnesium	-	-	-	-	-	-	-	-	-	-	-	-	32.4	28.5
Magnesium (dissolved)	-	-	-	-	-	-	-	-	-	-	-	-	-	28.5
Manganese	-	0.32	-	-	-	-	-	-	-	-	-	-	0.213	0.179
Manganese (dissolved)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	0.175
Manganese 2+	-	-	-	-	-	-	-	-	-	-	-	-	-	0.260
Mercury	0.002	0.00063	-	-	-	-	-	-	-	-	-	-	0.0002 U	0.0002 U
Mercury (dissolved)	0.002	0.00063	-	-	-	-	-	-	-	-	-	-	-	0.0002 U
Nickel	-	0.3	-	-	-	-	-	-	-	-	-	-	0.04 U	0.04 U
Nickel (dissolved)	-	0.3	-	-	-	-	-	-	-	-	-	-	-	0.04 U
Potassium	-	-	-	-	-	-	-	-	-	-	-	-	9.99	7.68
Potassium (dissolved)	-	-	-	-	-	-	-	-	-	-	-	-	-	7.78
Selenium	0.05	0.078	-	-	-	-	-	-	-	-	-	-	0.005 U	0.005 U
Selenium (dissolved)	0.05	0.078	-	-	-	-	-	-	-	-	-	-	-	0.005 U
Silver	-	0.071	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Silver (dissolved)	-	0.071	-	-	-	-	-	-	-	-	-	-	-	0.001 U
Sodium	-	-	-	-	-	-	-	-	-	-	-	-	40.6	43.1
Sodium (dissolved)	-	-	-	-	-	-	-	-	-	-	-	-	-	43.8
Thallium	0.002	0.00016	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
Thallium (dissolved)	0.002	0.00016	-	-	-	-	-	-	-	-	-	-	-	0.001 U
Vanadium	-	0.063	-	-	-	-	-	-	-	-	-	-	0.05 U	0.05 U
Vanadium (dissolved)	-	0.063	-	-	-	-	-	-	-	-	-	-	-	0.05 U
Zinc	-	4.7	-	-	-	-	-	-	-	-	-	-	0.02 U	0.02 U
Zinc (dissolved)	-	4.7	-	-	-	-	-	-	-	-	-	-	-	0.02 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*
Sample ID:					*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*GW-38443-091108-NZ-013*	*GW-38443-072109-GL-003*
Sample Date:					*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/11/2008*	*7/21/2009*
Sample Depth:					*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*
	USEPA Regional Screening Levels [1]													
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*										
	a	*b*	*c*	*d*										
PCBs														
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Aroclor-1221 (PCB-1221)	-	0.000004	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Aroclor-1232 (PCB-1232)	-	0.000004	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	-	-	-	-	-	-	-	-	0.0002 UJ	0.0002 U
Pesticides														
4,4'-DDD	-	0.000027	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
4,4'-DDE	-	0.0002	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
4,4'-DDT	-	0.0002	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Aldrin	-	0.000004	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
alpha-BHC	-	0.0000062	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
beta-BHC	-	0.000022	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Dieldrin	-	0.0000015	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Endosulfan sulfate	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Endrin	0.002	0.0017	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Endrin aldehyde	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
gamma-BHC (lindane)	0.0002	0.000036	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Heptachlor	0.0004	0.0000018	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Heptachlor epoxide	0.0002	0.0000033	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.00005 U
Methoxychlor	0.04	0.027	-	-	-	-	-	-	-	-	-	-	0.0001 U	0.0001 U
Toxaphene	0.003	0.000013	-	-	-	-	-	-	-	-	-	-	0.002 U	0.002 U
Herbicides														
2,4,5-TP (Silvex)	0.05	0.084	-	-	-	-	-	-	-	-	-	-	0.001 U	0.001 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.13	-	-	-	-	-	-	-	-	-	-	0.004 U	0.004 U
	-	-	-	-										
Gases	-	-	-	-										
Ethane	-	-	-	-	0.004	-	-	-	-	-	-	-	-	0.001
Ethene	-	-	-	-	U	-	-	-	-	-	-	-	-	0.0005 U
Methane	-	-	-	-	0.28 E/0.59 D	-	-	-	-	-	-	-	-	0.28
	-	-	-	-										

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*
Sample ID:					*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*GW-38443-091108-NZ-013*	*GW-38443-072109-GL-003*
Sample Date:					*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/11/2008*	*7/21/2009*
Sample Depth:					*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*	*694.48-686.48 ft AMSL*
	USEPA Regional Screening Levels [1]													
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*										
	a	*b*	*c*	*d*										
General Chemistry	-	-	-	-										
Alkalinity, total (as CaCO3)	-	-	-	-	340	-	-	-	-	-	-	-	-	309
Ammonia-N	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	39.1	-	-	-	-	-	-	-	-	41.0
Cyanide (total)	0.2	0.0014	-	-	-	-	-	-	-	-	-	-	-	0.010 U
Dissolved organic carbon (DOC)	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-	291
Nitrate (as N)	10	25	-	-	U	-	-	-	-	-	-	-	-	0.10 U
Nitrite (as N)	1	1.6	-	-	-	-	-	-	-	-	-	-	-	0.10 U
Sulfate	-	-	-	-	78	-	-	-	-	-	-	-	-	45.0
Sulfide (acid soluble)	-	-	-	-	-	-	-	-	-	-	-	-	-	3.0 U
Total organic carbon (TOC)	-	-	-	-	4	-	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

R - The parameter was rejected.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209A*	*MW-209A*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*
Sample ID:					*GW-38443-072209-GL-004*	*GW-38443-010510-DR-007*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*
Sample Date:					*7/22/2009*	*1/5/2010*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*
Sample Depth:					*660.34-655.34 ft AMSL*	*660.34-655.34 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
Volatiles											
1,1,1-Trichloroethane	0.2	7.5	0.74	3.1	0.001 U	0.001 U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	-	0.000066	0.0028	0.014	0.001 UJ	0.001 UJ	U	U	U	U	U
1,1,2-Trichloroethane	0.005	0.00024	0.00062	0.0026	0.001 U	0.001 U	-	-	-	-	-
1,1-Dichloroethane	-	0.0024	0.0065	0.034	0.001 U	0.001 U	U	U	U	U	U
1,1-Dichloroethene	0.007	0.26	0.020	0.082	0.001 U	0.001 U	-	-	-	-	-
1,2,4-Trichlorobenzene	0.07	0.00099	0.0036	0.015	0.001 UJ	0.001 U	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 U	0.002 UJ	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.0000065	0.00015	0.00075	0.001 U	0.001 U	-	-	-	-	-
1,2-Dichlorobenzene	0.6	0.28	0.27	1.1	0.001 U	0.001 U	-	-	-	-	-
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U	U	U	U	U	U
1,2-Dichloroethene (total)	-	0.13	-	-	-	-	U	U	U	U	U
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U	-	-	-	-	-
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	4.9	224	946	0.01 U	0.01 U	-	-	-	-	-
2-Hexanone	-	0.034	0.81	3.4	0.01 U	0.01 U	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	1	55	230	0.01 U	0.01 U	-	-	-	-	-
Acetone	-	12	2236	9784	0.01 U	0.01 U	U	U	U	U	U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U	U	U	U	U	U
Bromodichloromethane	0.08	0.00012	0.00076	0.0038	0.001 U	0.001 UJ	-	-	-	-	-
Bromoform	0.08	0.0079	-	-	0.001 U	0.001 U	U	U	U	U	U
Bromomethane (Methyl bromide)	-	0.007	0.0017	0.0073	0.001 U	0.001 U	-	-	-	-	-
Carbon disulfide	-	0.72	0.12	0.53	0.001 UJ	0.001 U	-	-	-	-	-
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U	-	-	-	-	-
Chlorobenzene	0.1	0.072	0.041	0.173	0.001 U	0.001 U	U	U	U	U	U
Chloroethane	-	21	2.2	9.7	0.001 U	0.001 UJ	U	U	U	U	U
Chloroform (Trichloromethane)	0.08	0.00019	0.00073	0.0035	0.001 U	0.001 U	-	-	-	-	-
Chloromethane (Methyl chloride)	-	0.19	0.026	0.11	0.001 U	0.001 U	-	-	-	-	-
cis-1,2-Dichloroethene	0.07	0.028	-	-	0.0011	0.001 U	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	0.001 UJ	0.001 UJ	-	-	-	-	-
Cyclohexane	-	13	0.103	0.42	0.001 UJ	0.001 U	-	-	-	-	-
Dibromochloromethane	0.08	0.00015	0.0028	0.014	0.001 U	0.001 UJ	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	0.19	0.0007	0.0031	0.001 UJ	0.001 UJ	-	-	-	-	-
Ethylbenzene	0.7	0.0013	0.0030	0.015	0.001 U	0.001 U	-	-	-	-	-
Isopropyl benzene	-	0.39	0.089	0.38	0.001 U	0.001 U	-	-	-	-	-
Methyl acetate	-	16	-	-	0.01 U	0.01 U	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	0.001 UJ	0.001 U	-	-	-	-	-
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U	-	-	-	-	-
Methylene chloride	0.005	0.0099	0.47	1.96	0.001 U	0.001 U	U	**0.0054 B[a]**	U	U	U
Styrene	0.1	1.1	0.89	3.91	0.001 U	0.001 U	U	U	U	U	U
Tetrachloroethene	0.005	0.0097	0.0058	0.025	0.001 U	0.001 U	U	U	U	U	U
Toluene	1	0.86	1.9	8.1	0.001 U	0.001 U	0.002 J	0.0058	0.0066	U	U
trans-1,2-Dichloroethene	0.1	0.086	0.038	0.16	0.001 U	0.001 U	-	-	-	-	-

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209A*	*MW-209A*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*
Sample ID:					*GW-38443-072209-GL-004*	*GW-38443-010510-DR-007*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*
Sample Date:					*7/22/2009*	*1/5/2010*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*
Sample Depth:					*660.34-655.34 ft AMSL*	*660.34-655.34 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
trans-1,3-Dichloropropene	-	-	-	-	0.001 UJ	0.001 UJ	-	-	-	-	-
Trichloroethene	0.005	0.00044	0.00052	0.0022	0.001 U	0.001 U	U	U	U	U	U
Trichlorofluoromethane (CFC-11)	-	1.1	0.018	0.078	0.001 U	0.001 U	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	-	53	0.14	0.60	0.001 U	0.001 U	-	-	-	-	-
Vinyl chloride	0.002	0.000015	0.00014	0.0025	**0.019**[abcd]	**0.011**[abcd]	U	U	U	U	U
Xylenes (total)	10	0.19	0.047	0.21	0.002 U	0.002 U	U	U	U	U	U
Semi-Volatiles											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	0.001 U	0.001 U	-	-	-	-	-
2,4,5-Trichlorophenol	-	0.89	-	-	0.005 U	0.005 U	-	-	-	-	-
2,4,6-Trichlorophenol	-	0.0035	-	-	0.005 U	0.005 U	-	-	-	-	-
2,4-Dichlorophenol	-	0.035	-	-	0.002 U	0.002 U	-	-	-	-	-
2,4-Dimethylphenol	-	0.27	-	-	0.002 U	0.002 U	-	-	-	-	-
2,4-Dinitrophenol	-	0.03	-	-	0.005 U	0.005 U	-	-	-	-	-
2,4-Dinitrotoluene	-	0.0002	-	-	0.005 U	0.005 U	-	-	-	-	-
2,6-Dinitrotoluene	-	0.000042	-	-	0.005 U	0.005 U	-	-	-	-	-
2-Chloronaphthalene	-	0.55	-	-	0.001 U	0.001 U	-	-	-	-	-
2-Chlorophenol	-	0.071	-	-	0.001 U	0.001 U	-	-	-	-	-
2-Methylnaphthalene	-	0.027	-	-	0.0002 U	0.0002 U	-	-	-	-	-
2-Methylphenol	-	0.72	-	-	0.001 U	0.001 U	-	-	-	-	-
2-Nitroaniline	-	0.15	-	-	0.002 U	0.002 U	-	-	-	-	-
2-Nitrophenol	-	-	-	-	0.002 U	0.002 U	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.00011	-	-	0.005 U	0.005 U	-	-	-	-	-
3-Nitroaniline	-	-	-	-	0.002 U	0.002 U	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	0.0012	-	-	0.005 U	0.005 U	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-	-	-
4-Chloro-3-methylphenol	-	1.1	-	-	0.002 U	0.002 U	-	-	-	-	-
4-Chloroaniline	-	0.00032	-	-	0.002 U	0.002 U	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U	-	-	-	-	-
4-Methylphenol	-	1.4	-	-	0.001 U	0.001 U	-	-	-	-	-
4-Nitroaniline	-	0.0033	-	-	0.002 U	0.002 U	-	-	-	-	-
4-Nitrophenol	-	-	-	-	0.005 U	0.005 U	-	-	-	-	-
Acenaphthene	-	0.4	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Acenaphthylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Acetophenone	-	1.5	-	-	0.001 U	0.001 U	-	-	-	-	-
Anthracene	-	1.3	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Atrazine	0.003	0.00026	-	-	0.001 U	0.001 U	-	-	-	-	-
Benzaldehyde	-	1.5	-	-	0.001 U	0.001 U	-	-	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	0.00083	3.34	14.29	0.001 U	0.001 U	-	-	-	-	-

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209A*	*MW-209A*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*
Sample ID:					*GW-38443-072209-GL-004*	*GW-38443-010510-DR-007*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*
Sample Date:					*7/22/2009*	*1/5/2010*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*
Sample Depth:					*660.34-655.34 ft AMSL*	*660.34-655.34 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
bis(2-Chloroethoxy)methane	-	0.046	-	-	0.001 U	0.001 U	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	0.001 U	0.001 U	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	0.002 U	0.002 U	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	0.014	-	-	0.001 U	0.001 U	-	-	-	-	-
Caprolactam	-	7.7	-	-	0.005 U	0.005 UJ	-	-	-	-	-
Carbazole	-	-	-	-	0.001 U	0.001 U	-	-	-	-	-
Chrysene	-	0.0029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Dibenzofuran	-	0.0058	-	-	0.001 U	0.001 U	-	-	-	-	-
Diethyl phthalate	-	11	-	-	0.001 U	0.001 U	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	0.001 U	0.001 U	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	0.67	-	-	0.001 U	0.001 U	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	0.16	-	-	0.001 U	0.001 U	-	-	-	-	-
Fluoranthene	-	0.63	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Fluorene	-	0.22	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Hexachlorobutadiene	-	0.00026	-	-	0.001 U	0.001 U	-	-	-	-	-
Hexachlorocyclopentadiene	0.05	0.022	-	-	0.01 U	0.01 U	-	-	-	-	-
Hexachloroethane	-	0.00079	-	-	0.001 U	0.001 U	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Isophorone	-	0.067	-	-	0.001 U	0.001 U	-	-	-	-	-
Naphthalene	-	0.00014	4.02	20.11	0.0002 U	0.0002 U	-	-	-	-	-
Nitrobenzene	-	0.00012	62.18	316.00	0.001 U	0.001 U	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	0.001 U	0.001 U	-	-	-	-	-
N-Nitrosodiphenylamine	-	0.01	-	-	0.001 U	0.001 U	-	-	-	-	-
Pentachlorophenol	0.001	0.000035	-	-	0.005 U	0.005 U	-	-	-	-	-
Phenanthrene	-	-	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Phenol	-	4.5	-	-	0.001 U	0.001 U	-	-	-	-	-
Pyrene	-	0.087	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Metals											
Aluminum	-	16	-	-	0.2 U	0.2 U	-	-	-	-	-
Aluminum (dissolved)	-	16	-	-	0.2 U	-	-	-	-	-	-
Antimony	0.006	0.006	-	-	0.002 U	0.002 U	-	-	-	-	-
Antimony (dissolved)	0.006	0.006	-	-	0.002 U	-	-	-	-	-	-

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209A*	*MW-209A*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*
Sample ID:					*GW-38443-072209-GL-004*	*GW-38443-010510-DR-007*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*
Sample Date:					*7/22/2009*	*1/5/2010*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*
Sample Depth:					*660.34-655.34 ft AMSL*	*660.34-655.34 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
Arsenic	0.01	0.000045	-	-	0.0031 J[b]	0.0033 J[b]	U	-	-	-	-
Arsenic (dissolved)	0.01	0.000045	-	-	0.003 J[b]	-	-	-	-	-	-
Barium	2	2.9	-	-	0.321	0.348	U	-	-	-	-
Barium (dissolved)	2	2.9	-	-	0.313	-	-	-	-	-	-
Beryllium	0.004	0.016	-	-	0.005 U	0.005 U	-	-	-	-	-
Beryllium (dissolved)	0.004	0.016	-	-	0.005 U	-	-	-	-	-	-
Cadmium	0.005	0.0069	-	-	0.001 U	0.001 U	U	-	-	-	-
Cadmium (dissolved)	0.005	0.0069	-	-	0.001 U	-	-	-	-	-	-
Calcium	-	-	-	-	69	76.5	-	-	-	-	-
Calcium (dissolved)	-	-	-	-	67	-	-	-	-	-	-
Chromium	0.1	-	-	-	0.01 U	0.01 U	0.013	-	-	-	-
Chromium (dissolved)	0.1	-	-	-	0.01 U	-	-	-	-	-	-
Cobalt	-	0.0047	-	-	0.05 U	0.05 U	-	-	-	-	-
Cobalt (dissolved)	-	0.0047	-	-	0.05 U	-	-	-	-	-	-
Copper	1.3	0.62	-	-	0.025 U	0.025 U	-	-	-	-	-
Copper (dissolved)	1.3	0.62	-	-	0.025 U	-	-	-	-	-	-
Iron	-	11	-	-	1.35	1.4	-	-	-	-	-
Iron (dissolved)	-	11	-	-	1.25	-	1.2	-	-	-	-
Lead	0.015	-	-	-	0.001 U	0.00024 J	U	-	-	-	-
Lead (dissolved)	0.015	-	-	-	0.001 U	-	-	-	-	-	-
Magnesium	-	-	-	-	56.9	61.6	-	-	-	-	-
Magnesium (dissolved)	-	-	-	-	55.4	-	-	-	-	-	-
Manganese	-	0.32	-	-	0.176	0.208	-	-	-	-	-
Manganese (dissolved)	-	0.32	-	-	0.171	-	-	-	-	-	-
Manganese 2+	-	-	-	-	0.566	0.359	-	-	-	-	-
Mercury	0.002	0.00063	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Mercury (dissolved)	0.002	0.00063	-	-	0.0002 U	-	-	-	-	-	-
Nickel	-	0.3	-	-	0.04 U	0.04 U	-	-	-	-	-
Nickel (dissolved)	-	0.3	-	-	0.04 U	-	-	-	-	-	-
Potassium	-	-	-	-	21.1	21.2	-	-	-	-	-
Potassium (dissolved)	-	-	-	-	20.6	-	-	-	-	-	-
Selenium	0.05	0.078	-	-	0.005 U	0.005 U	-	-	-	-	-
Selenium (dissolved)	0.05	0.078	-	-	0.005 U	-	-	-	-	-	-
Silver	-	0.071	-	-	0.001 U	0.001 U	-	-	-	-	-
Silver (dissolved)	-	0.071	-	-	0.001 U	-	-	-	-	-	-
Sodium	-	-	-	-	46.8	37.4	-	-	-	-	-
Sodium (dissolved)	-	-	-	-	45.8	-	-	-	-	-	-
Thallium	0.002	0.00016	-	-	0.001 U	0.001 U	-	-	-	-	-
Thallium (dissolved)	0.002	0.00016	-	-	0.001 U	-	-	-	-	-	-
Vanadium	-	0.063	-	-	0.05 U	0.05 U	-	-	-	-	-
Vanadium (dissolved)	-	0.063	-	-	0.05 U	-	-	-	-	-	-
Zinc	-	4.7	-	-	0.02 U	0.02 U	-	-	-	-	-
Zinc (dissolved)	-	4.7	-	-	0.02 U	-	-	-	-	-	-

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209A*	*MW-209A*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*
Sample ID:					*GW-38443-072209-GL-004*	*GW-38443-010510-DR-007*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*
Sample Date:					*7/22/2009*	*1/5/2010*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*
Sample Depth:					*660.34-655.34 ft AMSL*	*660.34-655.34 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
PCBs											
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	0.000004	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	0.000004	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	0.0002 U	**0.000046 J[b]**	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	0.0002 U	0.0002 U	-	-	-	-	-
Pesticides											
4,4'-DDD	-	0.000027	-	-	0.00005 UJ	0.00005 U	-	-	-	-	-
4,4'-DDE	-	0.0002	-	-	0.00005 U	0.00005 U	-	-	-	-	-
4,4'-DDT	-	0.0002	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Aldrin	-	0.000004	-	-	0.00005 U	0.00005 U	-	-	-	-	-
alpha-BHC	-	0.0000062	-	-	0.00005 U	**0.00004 J[b]**	-	-	-	-	-
alpha-Chlordane	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
beta-BHC	-	0.000022	-	-	0.00005 U	0.00005 U	-	-	-	-	-
delta-BHC	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Dieldrin	-	0.0000015	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Endosulfan I	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Endosulfan II	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Endosulfan sulfate	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Endrin	0.002	0.0017	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Endrin aldehyde	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Endrin ketone	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
gamma-BHC (lindane)	0.0002	0.000036	-	-	0.00005 U	0.00005 U	-	-	-	-	-
gamma-Chlordane	-	-	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Heptachlor	0.0004	0.0000018	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Heptachlor epoxide	0.0002	0.0000033	-	-	0.00005 U	0.00005 U	-	-	-	-	-
Methoxychlor	0.04	0.027	-	-	0.0001 U	0.0001 U	-	-	-	-	-
Toxaphene	0.003	0.000013	-	-	0.002 U	0.002 U	-	-	-	-	-
Herbicides											
2,4,5-TP (Silvex)	0.05	0.084	-	-	0.001 U	-	-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.13	-	-	0.004 U	-	-	-	-	-	-
	-	-	-	-							
Gases	-	-	-	-							
Ethane	-	-	-	-	0.0068	0.0033 J	0.001	-	-	-	-
Ethene	-	-	-	-	0.00026 J	0.0005 U	U	-	-	-	-
Methane	-	-	-	-	0.43	0.078	1.3 D/0.3 E	-	-	-	-
	-	-	-	-							

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-209A*	*MW-209A*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*
Sample ID:					*GW-38443-072209-GL-004*	*GW-38443-010510-DR-007*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*
Sample Date:					*7/22/2009*	*1/5/2010*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*
Sample Depth:					*660.34-655.34 ft AMSL*	*660.34-655.34 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
General Chemistry	-	-	-	-							
Alkalinity, total (as CaCO3)	-	-	-	-	394	374	270	-	-	-	-
Ammonia-N	-	-	-	-	-	-	1.7	-	-	-	-
Chloride	-	-	-	-	66.8	78.4	96.3	-	-	-	-
Cyanide (total)	0.2	0.0014	-	-	0.010 U	-	-	-	-	-	-
Dissolved organic carbon (DOC)	-	-	-	-	5	4	-	-	-	-	-
Hardness	-	-	-	-	407	445	-	-	-	-	-
Nitrate (as N)	10	25	-	-	0.10 U	0.10 U	U	-	-	-	-
Nitrite (as N)	1	1.6	-	-	0.10 U	0.10 U	-	-	-	-	-
Sulfate	-	-	-	-	58.8	65.0	94.5	-	-	-	-
Sulfide (acid soluble)	-	-	-	-	3.0 U	3.0 U	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	-	-	4	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

R - The parameter was rejected.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-218A*	*MW-218A*	*MW-218B*
Sample ID:					*MW212*	*MW212*	*MW212*	*GW-38443-090408-GL-001*	*GW-38443-072109-GL-001*	*GW-38443-122209-DR-003*	*GW-38443-072109-GL-002*
Sample Date:					*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/4/2008*	*7/21/2009*	*12/22/2009*	*7/21/2009*
Sample Depth:					*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*708.17-698.17 ft AMSL*	*708.17-698.17 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
Volatiles											
1,1,1-Trichloroethane	0.2	7.5	0.74	3.1	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane	-	0.000066	0.0028	0.014	U	U	U	0.001 U	0.001 UJ	0.001 U	0.001 UJ
1,1,2-Trichloroethane	0.005	0.00024	0.00062	0.0026	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	-	0.0024	0.0065	0.034	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.26	0.020	0.082	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00099	0.0036	0.015	-	-	-	0.001 U	0.001 UJ	0.001 U	0.001 UJ
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	-	-	-	0.002 UJ	0.002 U	0.002 UJ	0.002 U
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.0000065	0.00015	0.00075	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.28	0.27	1.1	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethene (total)	-	0.13	-	-	U	U	U	-	-	-	-
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	4.9	224	946	-	-	-	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	-	0.034	0.81	3.4	-	-	-	0.01 U	0.01 U	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	1	55	230	-	-	-	0.01 U	0.01 U	0.01 UJ	0.01 U
Acetone	-	12	2236	9784	U	U	U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
Bromodichloromethane	0.08	0.00012	0.00076	0.0038	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.08	0.0079	-	-	U	U	U	0.001 UJ	0.001 U	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.007	0.0017	0.0073	-	-	-	0.001 U	0.001 U	0.001 UJ	0.001 U
Carbon disulfide	-	0.72	0.12	0.53	-	-	-	0.001 UJ	0.001 UJ	0.001 U	0.001 UJ
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.1	0.072	0.041	0.173	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	-	21	2.2	9.7	U	U	U	0.001 U	0.001 U	0.001 UJ	0.001 U
Chloroform (Trichloromethane)	0.08	0.00019	0.00073	0.0035	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane (Methyl chloride)	-	0.19	0.026	0.11	-	-	-	0.001 U	0.001 U	0.001 UJ	0.001 U
cis-1,2-Dichloroethene	0.07	0.028	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Cyclohexane	-	13	0.103	0.42	-	-	-	0.001 U	0.001 UJ	0.001 U	0.001 UJ
Dibromochloromethane	0.08	0.00015	0.0028	0.014	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.19	0.0007	0.0031	-	-	-	0.001 U	0.001 UJ	0.001 UJ	0.001 UJ
Ethylbenzene	0.7	0.0013	0.0030	0.015	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Isopropyl benzene	-	0.39	0.089	0.38	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Methyl acetate	-	16	-	-	-	-	-	0.01 U	0.01 U	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	-	-	-	0.001 U	0.001 UJ	0.001 U	0.001 UJ
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
Methylene chloride	0.005	0.0099	0.47	1.96	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.1	1.1	0.89	3.91	U	U	U	0.001 UJ	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.005	0.0097	0.0058	0.025	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1	0.86	1.9	8.1	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,2-Dichloroethene	0.1	0.086	0.038	0.16	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-218A*	*MW-218A*	*MW-218B*
Sample ID:					*MW212*	*MW212*	*MW212*	*GW-38443-090408-GL-001*	*GW-38443-072109-GL-001*	*GW-38443-122209-DR-003*	*GW-38443-072109-GL-002*
Sample Date:					*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/4/2008*	*7/21/2009*	*12/22/2009*	*7/21/2009*
Sample Depth:					*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*708.17-698.17 ft AMSL*	*708.17-698.17 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ
Trichloroethene	0.005	0.00044	0.00052	0.0022	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	1.1	0.018	0.078	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	53	0.14	0.60	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	U	U	U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)	10	0.19	0.047	0.21	U	U	U	0.002 U	0.002 U	0.002 U	0.002 U
Semi-Volatiles											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
2,4,5-Trichlorophenol	-	0.89	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
2,4,6-Trichlorophenol	-	0.0035	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
2,4-Dichlorophenol	-	0.035	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
2,4-Dimethylphenol	-	0.27	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
2,4-Dinitrophenol	-	0.03	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
2-Chloronaphthalene	-	0.55	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
2-Chlorophenol	-	0.071	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
2-Methylnaphthalene	-	0.027	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
2-Methylphenol	-	0.72	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
2-Nitroaniline	-	0.15	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
2-Nitrophenol	-	-	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
3-Nitroaniline	-	-	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
4,6-Dinitro-2-methylphenol	-	0.0012	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
4-Chloro-3-methylphenol	-	1.1	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
4-Chloroaniline	-	0.00032	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
4-Methylphenol	-	1.4	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
4-Nitroaniline	-	0.0033	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
4-Nitrophenol	-	-	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
Acenaphthene	-	0.4	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Acenaphthylene	-	-	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Acetophenone	-	1.5	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Anthracene	-	1.3	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Atrazine	0.003	0.00026	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Benzaldehyde	-	1.5	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.00083	3.34	14.29	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-218A*	*MW-218A*	*MW-218B*
Sample ID:					*MW212*	*MW212*	*MW212*	*GW-38443-090408-GL-001*	*GW-38443-072109-GL-001*	*GW-38443-122209-DR-003*	*GW-38443-072109-GL-002*
Sample Date:					*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/4/2008*	*7/21/2009*	*12/22/2009*	*7/21/2009*
Sample Depth:					*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*708.17-698.17 ft AMSL*	*708.17-698.17 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
bis(2-Chloroethoxy)methane	-	0.046	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	0.0024 U	0.002 U	0.002 U	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Caprolactam	-	7.7	-	-	-	-	-	0.011	0.005 U	0.005 U	0.005 U
Carbazole	-	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Chrysene	-	0.0029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dibenzofuran	-	0.0058	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Diethyl phthalate	-	11	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Dimethyl phthalate	-	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Di-n-butylphthalate (DBP)	-	0.67	-	-	-	-	-	0.0012 U	0.001 U	0.001 U	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.16	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Fluoranthene	-	0.63	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Fluorene	-	0.22	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Hexachlorocyclopentadiene	0.05	0.022	-	-	-	-	-	0.01 U	0.01 U	0.01 U	0.01 U
Hexachloroethane	-	0.00079	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Isophorone	-	0.067	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Naphthalene	-	0.00014	4.02	20.11	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
Phenanthrene	-	-	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Phenol	-	4.5	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Pyrene	-	0.087	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Metals											
Aluminum	-	16	-	-	-	-	-	0.15 J	0.2 U	0.2 U	0.2 U
Aluminum (dissolved)	-	16	-	-	-	-	-	-	0.2 U	0.2 U	0.2 U
Antimony	0.006	0.006	-	-	-	-	-	0.002 U	0.00046 J	0.00027 J	0.002 U
Antimony (dissolved)	0.006	0.006	-	-	-	-	-	-	0.00045 J	0.00023 J	0.002 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-218A*	*MW-218A*	*MW-218B*
Sample ID:					*MW212*	*MW212*	*MW212*	*GW-38443-090408-GL-001*	*GW-38443-072109-GL-001*	*GW-38443-122209-DR-003*	*GW-38443-072109-GL-002*
Sample Date:					*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/4/2008*	*7/21/2009*	*12/22/2009*	*7/21/2009*
Sample Depth:					*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*708.17-698.17 ft AMSL*	*708.17-698.17 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
Arsenic	0.01	0.000045	-	-	-	-	-	**0.0037 J[b]**	**0.00074 J[b]**	**0.00057 J[b]**	**0.004 J[b]**
Arsenic (dissolved)	0.01	0.000045	-	-	-	-	-	-	**0.00083 J[b]**	**0.00056 J[b]**	**0.0041 J[b]**
Barium	2	2.9	-	-	-	-	-	0.175 J	0.104 J	0.089 J	0.186 J
Barium (dissolved)	2	2.9	-	-	-	-	-	-	0.104 J	0.0898 J	0.177 J
Beryllium	0.004	0.016	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
Beryllium (dissolved)	0.004	0.016	-	-	-	-	-	-	0.005 U	0.005 U	0.005 U
Cadmium	0.005	0.0069	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium (dissolved)	0.005	0.0069	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U
Calcium	-	-	-	-	-	-	-	37.7	51.4	46.1	98
Calcium (dissolved)	-	-	-	-	-	-	-	-	51.3	45.9	92.1
Chromium	0.1	-	-	-	-	-	-	0.01 U	0.01 U	0.01 U	0.01 U
Chromium (dissolved)	0.1	-	-	-	-	-	-	-	0.01 U	0.01 U	0.01 U
Cobalt	-	0.0047	-	-	-	-	-	0.05 U	0.05 U	0.05 U	0.05 U
Cobalt (dissolved)	-	0.0047	-	-	-	-	-	-	0.05 U	0.05 U	0.05 U
Copper	1.3	0.62	-	-	-	-	-	0.025 U	0.025 U	0.025 U	0.025 U
Copper (dissolved)	1.3	0.62	-	-	-	-	-	-	0.025 U	0.025 U	0.025 U
Iron	-	11	-	-	-	-	-	0.894	0.1 U	0.1 U	4.15
Iron (dissolved)	-	11	-	-	-	-	-	-	0.1 U	0.1 U	3.77
Lead	0.015	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Lead (dissolved)	0.015	-	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U
Magnesium	-	-	-	-	-	-	-	11.5	23.3	28.5	33.4
Magnesium (dissolved)	-	-	-	-	-	-	-	-	23.3	28.5	31.4
Manganese	-	0.32	-	-	-	-	-	0.0572	0.0586	0.0326	0.0705
Manganese (dissolved)	-	0.32	-	-	-	-	-	-	0.0593	0.032	0.0641
Manganese 2+	-	-	-	-	-	-	-	-	0.050 U	0.028 J	0.250 U
Mercury	0.002	0.00063	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury (dissolved)	0.002	0.00063	-	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U
Nickel	-	0.3	-	-	-	-	-	0.04 U	0.04 U	0.04 U	0.04 U
Nickel (dissolved)	-	0.3	-	-	-	-	-	-	0.04 U	0.04 U	0.04 U
Potassium	-	-	-	-	-	-	-	13.6	5.04	3.84 J	2.68 J
Potassium (dissolved)	-	-	-	-	-	-	-	-	5.1	3.86 J	2.56 J
Selenium	0.05	0.078	-	-	-	-	-	0.005 U	0.005 U	0.005 U	0.005 U
Selenium (dissolved)	0.05	0.078	-	-	-	-	-	-	0.005 U	0.005 U	0.005 U
Silver	-	0.071	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Silver (dissolved)	-	0.071	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U
Sodium	-	-	-	-	-	-	-	105	25.1	26.2	24.5
Sodium (dissolved)	-	-	-	-	-	-	-	-	25.5	26.1	23.5
Thallium	0.002	0.00016	-	-	-	-	-	0.001 U	0.001 U	0.001 U	0.001 U
Thallium (dissolved)	0.002	0.00016	-	-	-	-	-	-	0.001 U	0.001 U	0.001 U
Vanadium	-	0.063	-	-	-	-	-	0.05 U	0.05 U	0.05 U	0.05 U
Vanadium (dissolved)	-	0.063	-	-	-	-	-	-	0.05 U	0.05 U	0.05 U
Zinc	-	4.7	-	-	-	-	-	0.02 U	0.02 U	0.02 U	0.02 U
Zinc (dissolved)	-	4.7	-	-	-	-	-	-	0.02 U	0.02 U	0.02 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-218A*	*MW-218A*	*MW-218B*
Sample ID:					*MW212*	*MW212*	*MW212*	*GW-38443-090408-GL-001*	*GW-38443-072109-GL-001*	*GW-38443-122209-DR-003*	*GW-38443-072109-GL-002*
Sample Date:					*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/4/2008*	*7/21/2009*	*12/22/2009*	*7/21/2009*
Sample Depth:					*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*708.17-698.17 ft AMSL*	*708.17-698.17 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
PCBs											
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Aroclor-1221 (PCB-1221)	-	0.000004	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Aroclor-1232 (PCB-1232)	-	0.000004	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	-	-	-	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Pesticides											
4,4'-DDD	-	0.000027	-	-	-	-	-	0.00005 UJ	0.00005 U	0.00005 U	0.00005 U
4,4'-DDE	-	0.0002	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
4,4'-DDT	-	0.0002	-	-	-	-	-	0.00005 UJ	0.00005 U	0.00005 U	0.00005 U
Aldrin	-	0.000004	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
alpha-BHC	-	0.0000062	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
alpha-Chlordane	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
beta-BHC	-	0.000022	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
delta-BHC	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Dieldrin	-	0.0000015	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Endosulfan I	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Endosulfan II	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Endosulfan sulfate	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Endrin	0.002	0.0017	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Endrin aldehyde	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Endrin ketone	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
gamma-BHC (lindane)	0.0002	0.000036	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
gamma-Chlordane	-	-	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Heptachlor	0.0004	0.0000018	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Heptachlor epoxide	0.0002	0.0000033	-	-	-	-	-	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Methoxychlor	0.04	0.027	-	-	-	-	-	0.0001 UJ	0.0001 U	0.0001 UJ	0.0001 U
Toxaphene	0.003	0.000013	-	-	-	-	-	0.002 U	0.002 U	0.002 U	0.002 U
Herbicides											
2,4,5-TP (Silvex)	0.05	0.084	-	-	-	-	-	0.001 U	0.001 U	-	0.001 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.13	-	-	-	-	-	0.004 U	0.004 U	-	0.004 U
	-	-	-	-							
Gases	-	-	-	-							
Ethane	-	-	-	-	-	-	-	-	0.0005 U	0.0005 UJ	0.0005 U
Ethene	-	-	-	-	-	-	-	-	0.0005 U	0.0005 UJ	0.0005 U
Methane	-	-	-	-	-	-	-	-	0.039	0.016	0.0036
	-	-	-	-							

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-218A*	*MW-218A*	*MW-218B*
Sample ID:					*MW212*	*MW212*	*MW212*	*GW-38443-090408-GL-001*	*GW-38443-072109-GL-001*	*GW-38443-122209-DR-003*	*GW-38443-072109-GL-002*
Sample Date:					*7/2/2004*	*10/14/2004*	*8/3/2005*	*9/4/2008*	*7/21/2009*	*12/22/2009*	*7/21/2009*
Sample Depth:					*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*680.31-670.31 ft AMSL*	*708.17-698.17 ft AMSL*	*708.17-698.17 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]										
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*							
	a	*b*	*c*	*d*							
General Chemistry	-	-	-	-							
Alkalinity, total (as CaCO3)	-	-	-	-	-	-	-	-	194	199	308
Ammonia-N	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	-	43.1	42.8	54.6
Cyanide (total)	0.2	0.0014	-	-	-	-	-	-	0.010 U	-	0.010 U
Dissolved organic carbon (DOC)	-	-	-	-	-	-	-	-	3	2	2
Hardness	-	-	-	-	-	-	-	-	224	232	382
Nitrate (as N)	10	25	-	-	-	-	-	-	0.10 U	0.10 U	0.10 U
Nitrite (as N)	1	1.6	-	-	-	-	-	-	0.10 U	0.10 U	0.10 U
Sulfate	-	-	-	-	-	-	-	-	33.2	32.5	69.7
Sulfide (acid soluble)	-	-	-	-	-	-	-	-	3.0 U	3.0 U	3.0 U
Total organic carbon (TOC)	-	-	-	-	-	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

R - The parameter was rejected.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-218B*	*MW-218B*
Sample ID:					*GW-38443-122209-DR-001*	*GW-38443-122209-DR-002*
Sample Date:					*12/22/2009*	*12/22/2009*
Sample Depth:					*650.13-645.13 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]					*Duplicate*
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*		
	a	*b*	*c*	*d*		
Volatiles						
1,1,1-Trichloroethane	0.2	7.5	0.74	3.1	0.001 U	0.001 U
1,1,2,2-Tetrachloroethane	-	0.000066	0.0028	0.014	0.001 U	0.001 U
1,1,2-Trichloroethane	0.005	0.00024	0.00062	0.0026	0.001 U	0.001 U
1,1-Dichloroethane	-	0.0024	0.0065	0.034	0.001 U	0.001 U
1,1-Dichloroethene	0.007	0.26	0.020	0.082	0.001 U	0.001 U
1,2,4-Trichlorobenzene	0.07	0.00099	0.0036	0.015	0.001 U	0.001 U
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00000032	0.000027	0.00033	0.002 UJ	0.002 UJ
1,2-Dibromoethane (Ethylene dibromide)	0.00005	0.0000065	0.00015	0.00075	0.001 U	0.001 U
1,2-Dichlorobenzene	0.6	0.28	0.27	1.1	0.001 U	0.001 U
1,2-Dichloroethane	0.005	0.00015	0.0019	0.010	0.001 U	0.001 U
1,2-Dichloroethene (total)	-	0.13	-	-	-	-
1,2-Dichloropropane	0.005	0.00038	0.0021	0.010	0.001 U	0.001 U
1,3-Dichlorobenzene	-	-	-	-	0.001 U	0.001 U
1,4-Dichlorobenzene	0.075	0.00042	0.0022	0.011	0.001 U	0.001 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	4.9	224	946	0.01 U	0.01 U
2-Hexanone	-	0.034	0.81	3.4	0.01 U	0.01 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	1	55	230	0.01 UJ	0.01 UJ
Acetone	-	12	2236	9784	0.01 U	0.01 U
Benzene	0.005	0.00039	0.0014	0.0071	0.001 U	0.001 U
Bromodichloromethane	0.08	0.00012	0.00076	0.0038	0.001 U	0.001 U
Bromoform	0.08	0.0079	-	-	0.001 U	0.001 U
Bromomethane (Methyl bromide)	-	0.007	0.0017	0.0073	0.001 UJ	0.001 UJ
Carbon disulfide	-	0.72	0.12	0.53	0.001 U	0.001 U
Carbon tetrachloride	0.005	0.00039	0.00036	0.0018	0.001 U	0.001 U
Chlorobenzene	0.1	0.072	0.041	0.173	0.001 U	0.001 U
Chloroethane	-	21	2.2	9.7	0.001 UJ	0.001 UJ
Chloroform (Trichloromethane)	0.08	0.00019	0.00073	0.0035	0.001 U	0.001 U
Chloromethane (Methyl chloride)	-	0.19	0.026	0.11	0.001 UJ	0.001 UJ
cis-1,2-Dichloroethene	0.07	0.028	-	-	0.001 U	0.001 U
cis-1,3-Dichloropropene	-	-	-	-	0.001 UJ	0.001 UJ
Cyclohexane	-	13	0.103	0.42	0.001 U	0.001 U
Dibromochloromethane	0.08	0.00015	0.0028	0.014	0.001 U	0.001 U
Dichlorodifluoromethane (CFC-12)	-	0.19	0.0007	0.0031	0.001 UJ	0.001 UJ
Ethylbenzene	0.7	0.0013	0.0030	0.015	0.001 U	0.001 U
Isopropyl benzene	-	0.39	0.089	0.38	0.001 U	0.001 U
Methyl acetate	-	16	-	-	0.01 U	0.01 U
Methyl cyclohexane	-	-	-	-	0.001 U	0.001 U
Methyl tert butyl ether (MTBE)	-	0.012	0.39	1.96	0.005 U	0.005 U
Methylene chloride	0.005	0.0099	0.47	1.96	0.001 U	0.001 U
Styrene	0.1	1.1	0.89	3.91	0.001 U	0.001 U
Tetrachloroethene	0.005	0.0097	0.0058	0.025	0.001 U	0.001 U
Toluene	1	0.86	1.9	8.1	0.001 U	0.001 U
trans-1,2-Dichloroethene	0.1	0.086	0.038	0.16	0.001 U	0.001 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-218B*	*MW-218B*
Sample ID:					*GW-38443-122209-DR-001*	*GW-38443-122209-DR-002*
Sample Date:					*12/22/2009*	*12/22/2009*
Sample Depth:					*650.13-645.13 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]					*Duplicate*
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*		
	a	*b*	*c*	*d*		
trans-1,3-Dichloropropene	-	-	-	-	0.001 UJ	0.001 UJ
Trichloroethene	0.005	0.00044	0.00052	0.0022	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	-	1.1	0.018	0.078	0.001 U	0.001 U
Trifluorotrichloroethane (Freon 113)	-	53	0.14	0.60	0.001 U	0.001 U
Vinyl chloride	0.002	0.000015	0.00014	0.0025	0.001 U	0.001 U
Xylenes (total)	10	0.19	0.047	0.21	0.002 U	0.002 U
Semi-Volatiles						
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.00031	-	-	0.001 U	0.001 U
2,4,5-Trichlorophenol	-	0.89	-	-	0.005 U	0.005 U
2,4,6-Trichlorophenol	-	0.0035	-	-	0.005 U	0.005 U
2,4-Dichlorophenol	-	0.035	-	-	0.002 U	0.002 U
2,4-Dimethylphenol	-	0.27	-	-	0.002 U	0.002 U
2,4-Dinitrophenol	-	0.03	-	-	0.005 U	0.005 U
2,4-Dinitrotoluene	-	0.0002	-	-	0.005 U	0.005 U
2,6-Dinitrotoluene	-	0.000042	-	-	0.005 U	0.005 U
2-Chloronaphthalene	-	0.55	-	-	0.001 U	0.001 U
2-Chlorophenol	-	0.071	-	-	0.001 U	0.001 U
2-Methylnaphthalene	-	0.027	-	-	0.0002 U	0.0002 U
2-Methylphenol	-	0.72	-	-	0.001 U	0.001 U
2-Nitroaniline	-	0.15	-	-	0.002 U	0.002 U
2-Nitrophenol	-	-	-	-	0.002 U	0.002 U
3,3'-Dichlorobenzidine	-	0.00011	-	-	0.005 U	0.005 U
3-Nitroaniline	-	-	-	-	0.002 U	0.002 U
4,6-Dinitro-2-methylphenol	-	0.0012	-	-	0.005 U	0.005 U
4-Bromophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U
4-Chloro-3-methylphenol	-	1.1	-	-	0.002 U	0.002 U
4-Chloroaniline	-	0.00032	-	-	0.002 U	0.002 U
4-Chlorophenyl phenyl ether	-	-	-	-	0.002 U	0.002 U
4-Methylphenol	-	1.4	-	-	0.001 U	0.001 U
4-Nitroaniline	-	0.0033	-	-	0.002 U	0.002 U
4-Nitrophenol	-	-	-	-	0.005 U	0.005 U
Acenaphthene	-	0.4	-	-	0.0002 U	0.0002 U
Acenaphthylene	-	-	-	-	0.0002 U	0.0002 U
Acetophenone	-	1.5	-	-	0.001 U	0.001 U
Anthracene	-	1.3	-	-	0.0002 U	0.0002 U
Atrazine	0.003	0.00026	-	-	0.001 U	0.001 U
Benzaldehyde	-	1.5	-	-	0.001 U	0.001 U
Benzo(a)anthracene	-	0.000029	-	-	0.0002 U	0.0002 U
Benzo(a)pyrene	0.0002	0.0000029	-	-	0.0002 U	0.0002 U
Benzo(b)fluoranthene	-	0.000029	-	-	0.0002 U	0.0002 U
Benzo(g,h,i)perylene	-	-	-	-	0.0002 U	0.0002 U
Benzo(k)fluoranthene	-	0.00029	-	-	0.0002 U	0.0002 U
Biphenyl (1,1-Biphenyl)	-	0.00083	3.34	14.29	0.001 U	0.001 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-218B*	*MW-218B*
Sample ID:					*GW-38443-122209-DR-001*	*GW-38443-122209-DR-002*
Sample Date:					*12/22/2009*	*12/22/2009*
Sample Depth:					*650.13-645.13 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]					*Duplicate*
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*		
	a	*b*	*c*	*d*		
bis(2-Chloroethoxy)methane	-	0.046	-	-	0.001 U	0.001 U
bis(2-Chloroethyl)ether	-	0.000012	10.65	53.24	0.001 U	0.001 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	0.002 U	0.002 U
Butyl benzylphthalate (BBP)	-	0.014	-	-	0.001 U	0.001 U
Caprolactam	-	7.7	-	-	0.005 U	0.005 U
Carbazole	-	-	-	-	0.001 U	0.001 U
Chrysene	-	0.0029	-	-	0.0002 U	0.0002 U
Dibenz(a,h)anthracene	-	0.0000029	-	-	0.0002 U	0.0002 U
Dibenzofuran	-	0.0058	-	-	0.001 U	0.001 U
Diethyl phthalate	-	11	-	-	0.001 U	0.001 U
Dimethyl phthalate	-	-	-	-	0.001 U	0.001 U
Di-n-butylphthalate (DBP)	-	0.67	-	-	0.001 U	0.001 U
Di-n-octyl phthalate (DnOP)	-	0.16	-	-	0.001 U	0.001 U
Fluoranthene	-	0.63	-	-	0.0002 U	0.0002 U
Fluorene	-	0.22	-	-	0.0002 U	0.0002 U
Hexachlorobenzene	0.001	0.000042	-	-	0.0002 U	0.0002 U
Hexachlorobutadiene	-	0.00026	-	-	0.001 U	0.001 U
Hexachlorocyclopentadiene	0.05	0.022	-	-	0.01 U	0.01 U
Hexachloroethane	-	0.00079	-	-	0.001 U	0.001 U
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	0.0002 U	0.0002 U
Isophorone	-	0.067	-	-	0.001 U	0.001 U
Naphthalene	-	0.00014	4.02	20.11	0.0002 U	0.0002 U
Nitrobenzene	-	0.00012	62.18	316.00	0.001 U	0.001 U
N-Nitrosodi-n-propylamine	-	0.0000093	-	-	0.001 U	0.001 U
N-Nitrosodiphenylamine	-	0.01	-	-	0.001 U	0.001 U
Pentachlorophenol	0.001	0.000035	-	-	0.005 U	0.005 U
Phenanthrene	-	-	-	-	0.0002 U	0.0002 U
Phenol	-	4.5	-	-	0.001 U	0.001 U
Pyrene	-	0.087	-	-	0.0002 U	0.0002 U
Metals						
Aluminum	-	16	-	-	1.05	0.92
Aluminum (dissolved)	-	16	-	-	0.2 U	0.2 U
Antimony	0.006	0.006	-	-	0.00015 J	0.002 U
Antimony (dissolved)	0.006	0.006	-	-	0.002 U	0.002 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-218B*	*MW-218B*
Sample ID:					*GW-38443-122209-DR-001*	*GW-38443-122209-DR-002*
Sample Date:					*12/22/2009*	*12/22/2009*
Sample Depth:					*650.13-645.13 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]					*Duplicate*
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*		
	a	*b*	*c*	*d*		
Arsenic	0.01	0.000045	-	-	0.0076[b]	0.0078[b]
Arsenic (dissolved)	0.01	0.000045	-	-	0.0067[b]	0.0069[b]
Barium	2	2.9	-	-	0.191 J	0.197 J
Barium (dissolved)	2	2.9	-	-	0.195 J	0.192 J
Beryllium	0.004	0.016	-	-	0.005 U	0.005 U
Beryllium (dissolved)	0.004	0.016	-	-	0.005 U	0.005 U
Cadmium	0.005	0.0069	-	-	0.001 U	0.001 U
Cadmium (dissolved)	0.005	0.0069	-	-	0.001 U	0.001 U
Calcium	-	-	-	-	93.6	96.5
Calcium (dissolved)	-	-	-	-	91.9	90.2
Chromium	0.1	-	-	-	0.01 U	0.01 U
Chromium (dissolved)	0.1	-	-	-	0.01 U	0.01 U
Cobalt	-	0.0047	-	-	0.05 U	0.05 U
Cobalt (dissolved)	-	0.0047	-	-	0.05 U	0.05 U
Copper	1.3	0.62	-	-	0.025 U	0.025 U
Copper (dissolved)	1.3	0.62	-	-	0.025 U	0.025 U
Iron	-	11	-	-	3.87	3.86
Iron (dissolved)	-	11	-	-	2.45	2.42
Lead	0.015	-	-	-	0.00087 J	0.00076 J
Lead (dissolved)	0.015	-	-	-	0.001 U	0.001 U
Magnesium	-	-	-	-	32.9	34.1
Magnesium (dissolved)	-	-	-	-	32.6	31.9
Manganese	-	0.32	-	-	0.094	0.0905
Manganese (dissolved)	-	0.32	-	-	0.0578	0.0565
Manganese 2+	-	-	-	-	0.037 J	0.044 J
Mercury	0.002	0.00063	-	-	0.0002 U	0.0002 U
Mercury (dissolved)	0.002	0.00063	-	-	0.0002 U	0.0002 U
Nickel	-	0.3	-	-	0.04 U	0.04 U
Nickel (dissolved)	-	0.3	-	-	0.04 U	0.04 U
Potassium	-	-	-	-	2.87 J	2.93 J
Potassium (dissolved)	-	-	-	-	2.68 J	2.66 J
Selenium	0.05	0.078	-	-	0.005 U	0.005 U
Selenium (dissolved)	0.05	0.078	-	-	0.005 U	0.005 U
Silver	-	0.071	-	-	0.001 U	0.001 U
Silver (dissolved)	-	0.071	-	-	0.001 U	0.001 U
Sodium	-	-	-	-	23.8	24.7
Sodium (dissolved)	-	-	-	-	25.2	24.8
Thallium	0.002	0.00016	-	-	0.001 U	0.001 U
Thallium (dissolved)	0.002	0.00016	-	-	0.001 U	0.001 U
Vanadium	-	0.063	-	-	0.05 U	0.05 U
Vanadium (dissolved)	-	0.063	-	-	0.05 U	0.05 U
Zinc	-	4.7	-	-	0.02 U	0.02 U
Zinc (dissolved)	-	4.7	-	-	0.02 U	0.02 U

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-218B*	*MW-218B*
Sample ID:					*GW-38443-122209-DR-001*	*GW-38443-122209-DR-002*
Sample Date:					*12/22/2009*	*12/22/2009*
Sample Depth:					*650.13-645.13 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]					*Duplicate*
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*		
	a	*b*	*c*	*d*		
PCBs						
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	0.0002 U	0.0002 U
Aroclor-1221 (PCB-1221)	-	0.000004	-	-	0.0002 U	0.0002 U
Aroclor-1232 (PCB-1232)	-	0.000004	-	-	0.0002 U	0.0002 U
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	0.0002 U	0.0002 U
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	0.0002 U	0.0002 U
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	0.0002 U	0.0002 U
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	0.0002 U	0.0002 U
Pesticides						
4,4'-DDD	-	0.000027	-	-	0.00005 U	0.00005 U
4,4'-DDE	-	0.0002	-	-	0.00005 U	0.00005 U
4,4'-DDT	-	0.0002	-	-	0.00005 U	0.00005 U
Aldrin	-	0.000004	-	-	0.00005 U	0.00005 U
alpha-BHC	-	0.0000062	-	-	0.00005 U	0.00005 U
alpha-Chlordane	-	-	-	-	0.00005 U	0.00005 U
beta-BHC	-	0.000022	-	-	0.00005 U	0.00005 U
delta-BHC	-	-	-	-	0.00005 U	0.00005 U
Dieldrin	-	0.0000015	-	-	0.00005 U	0.00005 U
Endosulfan I	-	-	-	-	0.00005 U	0.00005 U
Endosulfan II	-	-	-	-	0.00005 U	0.00005 U
Endosulfan sulfate	-	-	-	-	0.00005 U	0.00005 U
Endrin	0.002	0.0017	-	-	0.00005 U	0.00005 U
Endrin aldehyde	-	-	-	-	0.00005 U	0.00005 U
Endrin ketone	-	-	-	-	0.00005 U	0.00005 U
gamma-BHC (lindane)	0.0002	0.000036	-	-	0.00005 U	0.00005 U
gamma-Chlordane	-	-	-	-	0.00005 U	0.00005 U
Heptachlor	0.0004	0.0000018	-	-	0.00005 U	0.00005 U
Heptachlor epoxide	0.0002	0.0000033	-	-	0.00005 U	0.00005 U
Methoxychlor	0.04	0.027	-	-	0.0001 UJ	0.0001 UJ
Toxaphene	0.003	0.000013	-	-	0.002 U	0.002 U
Herbicides						
2,4,5-TP (Silvex)	0.05	0.084	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.13	-	-	-	-
	-	-	-	-		
Gases	-	-	-	-		
Ethane	-	-	-	-	0.0005 UJ	0.00029 J
Ethene	-	-	-	-	0.00031 J	0.00026 J
Methane	-	-	-	-	0.0026	0.0028
	-	-	-	-		

TABLE B.2

HISTORIC GROUNDWATER MONITORING WELL SAMPLES ANALYTICAL RESULTS
OU2 SOUTHERN SITE PARCELS
MORAINE, OHIO

Sample Location:					*MW-218B*	*MW-218B*
Sample ID:					*GW-38443-122209-DR-001*	*GW-38443-122209-DR-002*
Sample Date:					*12/22/2009*	*12/22/2009*
Sample Depth:					*650.13-645.13 ft AMSL*	*650.13-645.13 ft AMSL*
	USEPA Regional Screening Levels [1]					*Duplicate*
Parameter	*MCL*	*TapWater*	*Protection of Residential IA*	*Protection of Industrial IA*		
	a	*b*	*c*	*d*		
General Chemistry	-	-	-	-		
Alkalinity, total (as CaCO3)	-	-	-	-	288	300
Ammonia-N	-	-	-	-	-	-
Chloride	-	-	-	-	57.9	58.2
Cyanide (total)	0.2	0.0014	-	-	-	-
Dissolved organic carbon (DOC)	-	-	-	-	2	2
Hardness	-	-	-	-	369	381
Nitrate (as N)	10	25	-	-	0.10 U	0.10 U
Nitrite (as N)	1	1.6	-	-	0.10 U	0.10 U
Sulfate	-	-	-	-	65.1	66.0
Sulfide (acid soluble)	-	-	-	-	3.0 U	3.0 U
Total organic carbon (TOC)	-	-	-	-	-	-

Notes:

All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

MCL - Maximum contaminant level.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

R - The parameter was rejected.

U - Compound was analyzed for but not detected.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

Concentration was greater than applicable criteria.

APPENDIX C

CONCEPTUAL SITE MODELS

TABLE C.1
HUMAN HEALTH CONCEPTUAL SITE MODEL
OPERABLE UNIT 1 PARCELS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

PRIMARY SOURCE	release mechanism	SECONDARY SOURCE	release mechanism	TERTIARY SOURCE	release mechanism	EXPOSURE ROUTE	RECEPTOR CHARACTERIZATION: POTENTIALLY EXPOSED RECEPTORS (HUMAN HEALTH - BASELINE CONDITIONS)														
							OU1 Parcels				OU2 Parcels (Excluding Quarry Pond)				OU2 Quarry Pond		Off-site properties			GMR / floodplain	
							Residents [1]	Site Workers	Temporary Workers	Trespassers	Residents [1]	Site Workers	Temporary Workers	Trespassers	Temporary Workers	Trespassers	Residents / workers	Temporary Workers	Trespassers	Recreation users	Temporary Workers
SURFACE AND SUBSURFACE LANDFILL CONTENTS (within OU1 Parcels)	direct contact					INCIDENTAL INGESTION DERMAL CONTACT	--	X	X	X	X	X	X	X	na	na	X	X	X	X	X
	waste decomposition/ volatilization	LANDFILL / SUBSURFACE GAS / VAPOR	subsurface migration	INDOOR AIR		INHALATION OF VAPORS (and accumulation of explosive gas)	--	X	--	--	--	X	--	--	--	--	X	--	--	--	--
			discharge to atmosphere	AMBIENT AIR	dispersion	INHALATION OF VAPORS	--	X	X	X	--	X	X	X	X	X	X	X	X	X	X
	volatilization/ wind erosion	AMBIENT AIR/ FUGITIVE DUST	dispersion/deposition			INHALATION OF VAPORS/ PARTICULATES INCIDENTAL INGESTION DERMAL CONTACT	--	X	X	X	--	X	X	X	X	X	X	X	X	X	X
	storm water runoff	SURFACE WATER i.e., intermittent drainage pathways	direct contact			INCIDENTAL INGESTION DERMAL CONTACT	--	X	X	X	--	X	X	X	--	--	X	X	X	X	X
		SEDIMENTS i.e., intermittent drainage pathways	direct contact			INCIDENTAL INGESTION DERMAL CONTACT	--	X	X	X	--	X	X	X	--	--	X	X	X	X	X
	storm water runoff	PONDS i.e., existing intermittent ponds	water circulation	SURFACE WATER	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	X	X	X	--	na	na	na	na	na	na	na	na	na	na
			sedimentation	SEDIMENT	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	X	X	X	--	na	na	na	na	na	na	na	na	na	na
			recharge to gw	GROUNDWATER see below																	
	infiltration / leaching	GROUNDWATER	migration to water wells			INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	X	--	--	--	--	--	--	--	--	X	--	--	--	--
			migration/discharge	SURFACE WATER Quarry Pond	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	na	na	na	na	na	na	na	na	X	X	na	na	na	na	na
			migration/discharge	SURFACE WATER Great Miami River	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	na	na	na	na	na	na	na	na	na	na	na	na	na	X	X
			volatilization and subsurface migration	INDOOR AIR		INHALATION OF VAPORS	--	X	--	--	--	X	--	--	--	--	X	--	--	--	--
			volatilization to atmosphere	AMBIENT AIR	dispersion	INHALATION OF VAPORS	--	X	X	X	--	X	X	X	--	--	X	X	X	X	X
			direct contact	GROUNDWATER	direct contact	INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	X	X	X	--	X	X	X	--	--	X	X	X	X	X

LEGEND

--	incomplete exposure pathway e.g., due to absence of exposure route and/or receptor
na	not applicable due to spatial separation
[1]	Respondents intend to put institutional controls, in the form of an envrionmental covenant in place for OU2, which would restrict residential use.
X	potentially complete exposure pathway to be evaluated/addressed as part of OU1
X	pathway to be addressed as part of vapor intrusion studies (and subject to OU2 groundwater assessment for off-site areas)
X	potentially complete exposure pathway to be evaluated for OU2

TABLE C.2
HUMAN HEALTH CONCEPTUAL SITE MODEL
OPERABLE UNIT 2 PARCELS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

PRIMARY SOURCE	release mechanism	SECONDARY SOURCE	release mechanism	TERTIARY SOURCE	release mechanism	EXPOSURE ROUTE	RECEPTOR CHARACTERIZATION														
							POTENTIALLY EXPOSED RECEPTORS (HUMAN HEALTH - BASELINE CONDITIONS)														
							OU1 Parcels				OU2 Parcels (excluding Quarry Pond)				OU2 Quarry Pond		Off-site properties			GMR / floodplain	
							Residents [1]	Site workers	Temporary Workers	Trespassers	Residents [1]	Site Workers	Temporary Workers	Trespassers	Temporary Workers	Trespassers	Residents / workers	Temporary Workers	Trespassers	Recreation users	Temporary Workers
SURFACE AND SUBSURFACE LANDFILL CONTENTS (within OU2 Parcels)	direct contact					INCIDENTAL INGESTION DERMAL CONTACT	na	na	na	na	--	X	X	X	X	X	na	na	na	X	X
	volatilization	SUBSURFACE GAS / VAPOR	subsurface migration	INDOOR AIR		INHALATION OF VAPORS (and accumulation of explosive gas)	--	X	--	--	--	X	--	--	--	--	X	--	--	--	--
			discharge to atmosphere	AMBIENT AIR	dispersion	INHALATION OF VAPORS	--	X	X	X	--	X	X	X	X	X	X	X	X	X	X
	volatilization/ wind erosion	AMBIENT AIR/ FUGITIVE DUST	dispersion/deposition			INHALATION OF VAPORS/ PARTICULATES INCIDENTAL INGESTION DERMAL CONTACT	--	X	X	X	--	X	X	X	X	X	X	X	X	X	X
	storm water runoff	SURFACE WATER i.e., intermittent drainage pathways	direct contact			INCIDENTAL INGESTION DERMAL CONTACT	--	--	--	--	--	X	X	X	--	--	X	X	X	X	X
		SEDIMENTS i.e., intermittent drainage pathways	direct contact			INCIDENTAL INGESTION DERMAL CONTACT	--	--	--	--	--	X	X	X	--	--	X	X	X	X	X
	storm water runoff	QUARRY POND	water circulation	SURFACE WATER	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	--	--	--	--	--	--	--	X	X	--	--	--	--	--
			sedimentation	SEDIMENT	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	--	--	--	--	--	--	--	X	X	--	--	--	--	--
			recharge to gw	GROUNDWATER see below																	
	infiltration / leaching	GROUNDWATER	migration to water wells			INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	X	--	--	--	--	--	--	--	--	X	--	--	--	--
			migration/discharge	SURFACE WATER Quarry Pond	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	na	na	na	na	na	na	na	na	X	X	na	na	na	na	na
			migration/discharge	SURFACE WATER Great Miami River	direct contact	INCIDENTAL INGESTION DERMAL CONTACT INHALATION OF VAPORS	na	na	na	na	na	na	na	na	na	na	na	na	na	X	X
			volatilization and subsurface migration	INDOOR AIR		INHALATION OF VAPORS	--	X	--	--	--	X	--	--	--	--	X	--	--	--	--
			volatilization to atmosphere	AMBIENT AIR	dispersion	INHALATION OF VAPORS	--	X	X	X	--	X	X	X	--	--	X	X	X	X	X
			direct contact	GROUNDWATER	direct contact	INGESTION DERMAL CONTACT INHALATION OF VAPORS	--	X	X	X	--	X	X	X	--	--	X	X	X	X	X

LEGEND

--	incomplete exposure pathway e.g., due to absence of exposure route and/or receptor
na	not applicable due to spatial separation
[1]	Respondents intend to put institutional controls, in the form of an envrionmental covenant in place for OU2, which would restrict residential use.
X	potentially complete exposure pathway to be evaluated/addressed as part of OU1
X	pathway to be addressed as part of vapor intrusion studies (and subject to OU2 groundwater assessment for off-site areas)
X	potentially complete exposure pathway to be evaluated for OU2

TABLE C.3
ECOLOGICAL CONCEPTUAL SITE MODEL
OPERABLE UNIT 1 AND 2 PARCELS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

PRIMARY SOURCE	release mechanism	SECONDARY SOURCE	release mechanism	TERTIARY SOURCE	release mechanism	EXPOSURE ROUTE	RECEPTOR CHARACTERIZATION: POTENTIALLY EXPOSED RECEPTORS (ECOLOGICAL / HUMAN HEALTH - BASELINE CONDITIONS)											
							OU1 Parcels		OU2 Parcels (excluding Quarry Pond)		OU2 Quarry Pond			Off-site properties		Great Miami River / floodplain		
							Terrestrial Biota	Aquatic Biota	Terrestrial Biota	Aquatic Biota	Terrestrial Biota	Aquatic Biota	Humans that consume fish	Terrestrial Biota	Aquatic Biota	Terrestrial Biota	Aquatic Biota	Humans that consume fish
SURFACE LANDFILL CONTENTS (within OU1 Parcels)	direct contact					INGESTION	X	X	na	na	na	na	na	na	na	na	na	na
	plant uptake	VEGETATION	direct contact			INGESTION	X	X	na	na	na	na	na	na	na	na	na	na
	stormwater runoff	SURFACE WATER AND SEDIMENT	direct contact			INGESTION	X	X	(a)	(a)	(a)	(a)	--	X	X	X	X	--
			direct contact	AQUATIC ORGANISMS		INGESTION	X	X	(a)	(a)	(a)	(a)	--	X	X	X	X	X
SURFACE LANDFILL CONTENTS (within OU2 Parcels)	direct contact					INGESTION	na	na	X	--	--	X	--	na	na	na	na	na
	plant uptake	VEGETATION	direct contact			INGESTION	na	na	X	--	--	X	--	na	na	na	na	na
	stormwater runoff	SURFACE WATER AND SEDIMENT	direct contact			INGESTION	(a)	(a)	X	X	--	--	--	X	X	X	X	--
			direct contact	AQUATIC ORGANISMS		INGESTION	(a)	(a)	X	X	--	--	--	X	X	X	X	X
	stormwater runoff and infiltration	QUARRY POND	direct contact			INGESTION	na	na	na	na	X	X	--	na	na	na	na	na
			direct contact	AQUATIC ORGANISMS		INGESTION	na	na	na	na	X	X	X	na	na	na	na	na

LEGEND

--	incomplete exposure pathway e.g., due to absence of exposure route and/or receptor
na	not applicable due to spatial separation
(a)	potential cross-boundary effects between OU1 Parcels and OU2 Parcels will be considered in the OU2 RI/FS
X	potentially complete exposure pathway to be evaluated/addressed as part of OU1
X	potentially complete exposure pathway to be evaluated for OU2

CONCEPTUAL SITE MODEL NOTES
OPERABLE UNIT 1 AND 2 PARCELS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Notes

1 OU1 includes the following parcels:

- Parcel 5054 (Valley Asphalt)
- Parcels 5171, 5172, 5173, 5174, 5175, 5176 (Boesch and Grillot)
- Parcel 5177 including road easement but excluding water and submerged portions of the Quarry Pond (Boesch and Grillot)
- Parcel 3278, 3058, 3057, and 3056 including embankments [owned by the MCD] onto which waste extends
- Part of Parcel 5178 containing north Quarry Pond embankment (Boesch and Grillot)

Collectively, these parcels comprise the presumptive remedy area (PRA).

2 OU2 includes the following areas or media, which are not part of OU1:

- Landfill material, surface and subsurface soil, groundwater, and air outside the OU1 Area attributable to historic Site operations
- Parcel 3274 and parts of Parcels 5177 and 5178 not addressed in OU1, including submerged portions of the Quarry Pond
- Portions of Parcel 3275 upon which waste has been placed (owned by MCD)
- Parcels 3753, 4423, 4610, and 3252, including active businesses along the southeast portion of the Site
- Shallow groundwater (i.e., nominally at elevations above 675 feet above mean sea level [ft AMSL]), outside the OU1 Area
- Deeper groundwater (i.e., nominally at elevations below 675 ft AMSL), outside the OU1 Area
- Leachate outside the OU1 Area (e.g., the floodplain area between the Site and the GMR
- Landfill gas (LFG) and soil vapor outside the OU1 Area
- Surface water and sediment outside the OU1 Area (e.g., in the Quarry Pond and in the GMR adjacent to and downstream of the Site)
- Air outside the OU1 Area

[1] The MCD defines a floodplain as a strip of relatively flat and normally dry land alongside a stream, river or lake that is covered by water during a flood. The floodplain area between the Site and the GMR is not the same as the 100-year floodway and 100-year floodplain areas at the Site based on Federal Emergency Management Agency (FEMA) flood insurance maps, which are more extensive than the MCD definition.

APPENDIX D

SCREENING LEVELS

TABLE D.1

SOIL SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]				*Ecological Screening Levels [2]*	*Ecological Screening Values [3], [4]*	*Ohio EPA VAP Derived Leach-Based Soil Values 2008*				
			Protection of Ground Water					*Table I*		*Table II*	
	Residential Soil	*Industrial Soil*	*Risk-Based SSL*	*MCL-based SSL*			*Soil Type I*	*Soil Type II*	*Soil Type III*	*Sources ≥ ½ Acre*	*Sources < ½ Acre*
	µg/kg	*µg/kg*	*µg/kg*	*µg/kg*	*µg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
Parameter											
Volatile Organic Compounds											
1,1,1-Trichloroethane	870000	3800000	260	70	29800		1.2	0.74	1.3	-	-
1,1,2,2-Tetrachloroethane	560	2800	0.026		127		-	-	-	-	-
1,1,2-Trichloroethane	160	680	0.013	1.6	28600		-	-	-	-	-
1,1-Dichloroethane	3300	17000	0.68		20100		-	-	-	-	-
1,1-Dichloroethene	24000	110000	9.3	2.5	8280		0.28	0.10	0.24	-	-
1,1-Dichloropropane					-		-	-	-	-	-
1,2,3-Trichloropropane	5	95	0.00028		3360		-	-	-	-	-
1,2,4-Trichlorobenzene	6200	27000	1.1	200	11100		-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	5.4	69	0.00014	0.086	35.2		-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	34	170	0.0018	0.014	1230		-	-	-	-	-
1,2-Dichlorobenzene	190000	980000	27	580	2960		-	-	-	-	-
1,2-Dichloroethane	430	2200	0.042	1.4	21200	0.4	0.0030	0.0020	0.0030	-	-
1,2-Dichloroethene (total)	70000	920000	3.7		-		-	-	-	-	-
1,2-Dichloropropane	940	4700	0.13	1.7	32700	700	-	-	-	-	-
1,3-Dichlorobenzene					37700		-	-	-	-	-
1,4-Dichloro-2-butene	6.9	35	0.00054		-		-	-	-	-	-
1,4-Dichlorobenzene	2400	12000	0.4	72	546		-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	2800000	20000000	100		89600		1.8	1.8	1.8	-	-
2-Chloroethyl vinyl ether					-		-	-	-	-	-
2-Hexanone	21000	140000	0.79		12600		-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	530000	5300000	23		443000		-	-	-	-	-
Acetone	6100000	63000000	240		2500		-	-	-	-	-
Acrolein	15	65	0.00084		5270		-	-	-	-	-
Acrylonitrile	240	1200	0.0098		23.9	1000	-	-	-	-	-
Benzene	1100	5400	0.2	2.6	255	0.05	0.017	0.0090	0.015	-	-
Bromodichloromethane	270	1400	0.032	22	540		-	-	-	-	-
Bromoform	62000	220000	2.1	21	15900		-	-	-	-	-
Bromomethane (Methyl bromide)	730	3200	0.18		235		-	-	-	-	-
Carbon disulfide	82000	370000	21		94.1		-	-	-	-	-
Carbon tetrachloride	610	3000	0.15	1.9	2980	1000	0.25	0.25	0.28	-	-
Chlorobenzene	29000	140000	4.9	68	13100	0.05	-	-	-	-	-
Chloroethane	1500000	6100000	590		-		-	-	-	-	-
Chloroform (Trichloromethane)	290	1500	0.053	22	1190	0.001	-	-	-	-	-
Chloromethane (Methyl chloride)	12000	50000	4.9		10400		-	-	-	-	-
cis-1,2-Dichloroethene	16000	200000	0.82	21	-		0.12	0.070	0.12	-	-
cis-1,3-Dichloropropene					398		-	-	-	-	-
Cyclohexane	700000	2900000	1300		-	0.1	-	-	-	-	-
Dibromochloromethane	680	3300	0.039	21	2050		-	-	-	-	-
Dibromomethane	2500	11000	0.19		65000		-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	9400	40000	30		39500		-	-	-	-	-
Dichlorofluoromethane					-		-	-	-	-	-
Ethyl methacrylate	150000	750000	9.9		30000		-	-	-	-	-
Ethylbenzene	5400	27000	1.5	780	5160	0.05	12	7.9	16	-	-
Iodomethane					1230		-	-	-	-	-
Isopropyl benzene (Cumene)					-		-	-	-	-	-
Methyl acetate	7800000	100000000	320		-		-	-	-	-	-
Methyl cyclohexane					-		-	-	-	-	-
Methyl tert butyl ether (MTBE)	43000	220000	2.8		-		-	-	-	-	-
Methylene chloride	36000	310000	2.2	1.3	4050		-	-	-	-	-
n-Hexane					-		121	111	104	-	-
Styrene	630000	3600000	120	110	4690	0.1	0.46	0.37	0.62	-	-
Tetrachloroethene	8600	41000	1.6	2.3	9920	0.01	0.15	0.11	0.27	-	-
Toluene	500000	4500000	59	690	5450	0.05	6.8	4.1	7.7	-	-
trans-1,2-Dichloroethene	15000	69000	2.5	29	784		0.036	0.023	0.048	-	-
trans-1,3-Dichloropropene					398		-	-	-	-	-
Trichloroethene	440	2000	0.092	1.8	12400	0.001	0.036	0.023	0.048	-	-
Trichlorofluoromethane (CFC-11)	79000	340000	69		16400		-	-	-	-	-

TABLE D.1

SOIL SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]				*Ecological Screening Levels [2]*	*Ecological Screening Values [3], [4]*	*Ohio EPA VAP Derived Leach-Based Soil Values 2008*				
			Protection of Ground Water					*Table I*		*Table II*	
	Residential Soil	*Industrial Soil*	*Risk-Based SSL*	*MCL-based SSL*			*Soil Type I*	*Soil Type II*	*Soil Type III*	*Sources ≥ ½ Acre*	*Sources < ½ Acre*
	µg/kg	*µg/kg*	*µg/kg*	*µg/kg*	*µg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
Parameter											
Trifluorotrichloroethane (Freon 113)	4300000	18000000	13000		-		-	-	-	-	-
Vinyl acetate	97000	410000	8.7		12700		-	-	-	-	-
Vinyl chloride	60	1700	0.0053	0.69	646	0.01	0.0090	0.0050	0.012	-	-
Xylenes (total)	63000	270000	19	9800	10000	0.05	156	96	191	-	-
Semi-Volatile Organic Compounds											
1,2,4-Trichlorobenzene	6200	27000	1.1	200	11100		-	-	-	-	-
1,2-Dichlorobenzene	190000	980000	27	580	2960		-	-	-	-	-
1,3-Dichlorobenzene					37700		-	-	-	-	-
1,4-Dichlorobenzene	2400	12000	0.4	72	546		-	-	-	-	-
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4600	22000	0.11		19900		-	-	-	-	-
2,4,5-Trichlorophenol	610000	6200000	330		14100	4	-	-	-	-	-
2,4,6-Trichlorophenol	6100	62000	3.4		9940	10	-	-	-	-	-
2,4-Dichlorophenol	18000	180000	4.1		87500		-	-	-	-	-
2,4-Dimethylphenol	120000	1200000	32		10		-	-	-	-	-
2,4-Dinitrophenol	12000	120000	3.4		60.9		-	-	-	-	-
2,4-Dinitrotoluene	1600	5500	0.28		1280		-	-	-	-	-
2,6-Dinitrotoluene	330	1200	0.058		32.8		-	-	-	-	-
2-Chloronaphthalene	630000	8200000	290		12.2		-	-	-	-	-
2-Chlorophenol	39000	510000	5.7		243		-	-	-	-	-
2-Methylnaphthalene	23000	220000	14		3240		-	-	-	-	-
2-Methylphenol	310000	3100000	58		40400		-	-	-	-	-
2-Nitroaniline	61000	600000	6.2		74100		-	-	-	-	-
2-Nitrophenol					1600		-	-	-	-	-
3&4-Methylphenol					-		-	-	-	-	-
3,3'-Dichlorobenzidine	1100	3800	0.71		646		-	-	-	-	-
3-Nitroaniline					3160		-	-	-	-	-
4,6-Dinitro-2-methylphenol	490	4900	0.2		144		-	-	-	-	-
4-Bromophenyl phenyl ether					-		-	-	-	-	-
4-Chloro-3-methylphenol	610000	6200000	130		7950		-	-	-	-	-
4-Chloroaniline	2400	8600	0.13		1100		-	-	-	-	-
4-Chlorophenyl phenyl ether					-		-	-	-	-	-
4-Methylphenol	610000	6200000	110		163000		-	-	-	-	-
4-Nitroaniline	24000	86000	1.4		21900		-	-	-	-	-
4-Nitrophenol					5120	7	-	-	-	-	-
Acenaphthene	340000	3300000	410		682000	20	-	-	-	-	-
Acenaphthylene					682000		-	-	-	-	-
Acetophenone	780000	10000000	45		300000		-	-	-	-	-
Anthracene	1700000	17000000	4200		1480000	0.1	-	-	-	-	-
Atrazine	2100	7500	0.17	1.9	-	0.00005	-	-	-	-	-
Benzaldehyde	780000	10000000	33		-		-	-	-	-	-
Benzo(a)anthracene	150	2100	10		5210		-	-	-	-	-
Benzo(a)pyrene	15	210	3.5	240	1520	0.1	-	-	-	-	-
Benzo(b)fluoranthene	150	2100	35		59800		-	-	-	-	-
Benzo(g,h,i)perylene					119000		-	-	-	-	-
Benzo(k)fluoranthene	1500	21000	350		148000		-	-	-	-	-

TABLE D.1

SOIL SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]				*Ecological Screening Levels [2]*	*Ecological Screening Values [3], [4]*	*Ohio EPA VAP Derived Leach-Based Soil Values 2008*				
			Protection of Ground Water					*Table I*		*Table II*	
	Residential Soil	*Industrial Soil*	*Risk-Based SSL*	*MCL-based SSL*			*Soil Type I*	*Soil Type II*	*Soil Type III*	*Sources ≥ ½ Acre*	*Sources < ½ Acre*
	µg/kg	*µg/kg*	*µg/kg*	*µg/kg*	*µg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
Parameter											
Biphenyl (1,1-Biphenyl)	5100	21000	0.87		-	60	-	-	-	-	-
bis(2-Chloroethoxy)methane	18000	180000	1.1		302		-	-	-	-	-
bis(2-Chloroethyl)ether	210	1000	0.0031		23700		-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	35000	120000	1100	1400	925		-	-	-	-	-
Butyl benzylphthalate (BBP)	260000	910000	200		239		-	-	-	-	-
Caprolactam	3000000	30000000	190		-		-	-	-	-	-
Carbazole					-		-	-	-	-	-
Chrysene	15000	210000	1100		4730		-	-	-	-	-
Dibenz(a,h)anthracene	15	210	11		18400		-	-	-	-	-
Dibenzofuran	7800	100000	11		-		-	-	-	-	-
Diethyl phthalate	4900000	49000000	470		24800	100	-	-	-	-	-
Dimethyl phthalate					734000	200	-	-	-	-	-
Di-n-butylphthalate (DBP)	610000	6200000	170		150	200	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	61000	620000	4400		709000		-	-	-	-	-
Fluoranthene	230000	2200000	7000		122000	0.1	-	-	-	-	-
Fluorene	230000	2200000	400		122000	30	-	-	-	-	-
Hexachlorobenzene	300	1100	0.53	13	199	0.0025	-	-	-	-	-
Hexachlorobutadiene	6100	22000	0.5		39.8		-	-	-	-	-
Hexachlorocyclopentadiene	37000	370000	7	160	755	10	-	-	-	-	-
Hexachloroethane	4300	43000	0.31		596		-	-	-	-	-
Indeno(1,2,3-cd)pyrene	150	2100	200		109000		-	-	-	-	-
Isophorone	510000	1800000	22		139000		-	-	-	-	-
Naphthalene	3600	18000	0.47		99.4	0.1	0.27	0.28	0.36	-	-
Nitrobenzene	4800	24000	0.079		1310		-	-	-	-	-
N-Nitrosodi-n-propylamine	69	250	0.007		544		-	-	-	-	-
N-Nitrosodiphenylamine	99000	350000	57		545		-	-	-	-	-
Pentachlorophenol	890	2700	0.36	10	119		-	-	-	-	-
Phenanthrene					45700	0.1	-	-	-	-	-
Phenol	1800000	18000000	260		120000	0.05	1.1	1.1	1.2	-	-
Pyrene	170000	1700000	950		78500	0.1	-	-	-	-	-
Total low molecular weight (LMW) PAHs											
Total high molecular weight (HMW) PAHs											
Total PAHs						1.0					
Metals											
Aluminum	7700000	99000000	2300000		-	50	-	-	-	-	-
Antimony	3100	41000	27	270	142	3.5	-	-	-	3.6	7.2
Arsenic	610	2400	1.3	290	5700	10	-	-	-	3	6
Barium	1500000	19000000	12000	82000	1040	165	-	-	-	56000	110000
Beryllium	16000	200000	1300	3200	1060	1.1	-	-	-	57	114
Cadmium	7000	80000	52	380	2.22	1.6	-	-	-	21	42
Calcium					-		-	-	-	-	-
Chromium				180000000	400	0.4	-	-	-	56	113
Cobalt	2300	30000	21		140	20	-	-	-	-	-
Copper	310000	4100000	2200	46000	5400	40	-	-	-	-	-
Iron	5500000	72000000	27000		-	200	-	-	-	-	-
Lead	400000	800000		14000	53.7	50	-	-	-	89	178
Magnesium					-		-	-	-	-	-
Manganese	180000	2300000	2100		-	100	-	-	-	-	-
Mercury	1000	4300	3.3	100	100	0.1	-	-	-	12	23
Nickel	150000	2000000	2000		13600	30	-	-	-	182	363
Potassium					-		-	-	-	-	-
Selenium	39000	510000	40	260	27.6	0.81	-	-	-	2.15	4.3
Silver	39000	510000	60		4040	2.0	-	-	-	3120	6240
Sodium					-		-	-	-	-	-
Thallium	78	1000	1.1	140	56.9	1.0	-	-	-	1.5	3.0
Vanadium	39000	510000	6300		1590	2.0	-	-	-	130	65
Zinc	2300000	31000000	29000		6620	50	-	-	-	44000	88000

TABLE D.1

SOIL SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]				*Ecological Screening Levels [2]*	*Ecological Screening Values [3], [4]*	*Ohio EPA VAP Derived Leach-Based Soil Values 2008*				
			Protection of Ground Water					*Table I*		*Table II*	
Parameter	*Residential Soil µg/kg*	*Industrial Soil µg/kg*	*Risk-Based SSL µg/kg*	*MCL-based SSL µg/kg*	*µg/kg*	*mg/kg*	*Soil Type I mg/kg*	*Soil Type II mg/kg*	*Soil Type III mg/kg*	*Sources ≥ ½ Acre mg/kg*	*Sources < ½ Acre mg/kg*
PCBs											
Total PCBs	220	740	26	78		0.02					
Pesticides											
4,4'-DDD	2000	7200	6.4		758		-	-	-	-	-
4,4'-DDE	1400	5100	46		596		-	-	-	-	-
4,4'-DDT	1700	7000	67		3.5		-	-	-	-	-
Aldrin	29	100	0.65		3.32	0.0025	-	-	-	-	-
alpha-BHC	77	270	0.036		99.4		-	-	-	-	-
alpha-Chlordane	1600	6500	13	140	-		-	-	-	-	-
beta-BHC	270	960	0.13		3.98		-	-	-	-	-
Chlordane					224		-	-	-	-	-
delta-BHC					9940		-	-	-	-	-
Dieldrin	30	110	0.061		2.38	0.0005	-	-	-	-	-
Endosulfan I					119		-	-	-	-	-
Endosulfan II					119		-	-	-	-	-
Endosulfan sulfate					35.8		-	-	-	-	-
Endrin	1800	18000	6.8	81	10.1	0.001	-	-	-	-	-
Endrin aldehyde					10.5		-	-	-	-	-
Endrin ketone					-		-	-	-	-	-
gamma-BHC (lindane)	520	2100	0.21	1.2	5		-	-	-	-	-
gamma-Chlordane	1600	6500	13	140	-		-	-	-	-	-
Heptachlor	110	380	0.14	33	5.98		-	-	-	-	-
Heptachlor epoxide	53	190	0.068	4.1	152		-	-	-	-	-
Methoxychlor	31000	310000	150	2200	19.9		-	-	-	-	-
Toxaphene	440	1600	2.1	460	119		-	-	-	-	-
Herbicides											
2,4,5-TP (Silvex)	49000	490000	4.6	28	109		-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	69000	770000	3.5	18	27.2		-	-	-	-	-
Petroleum Hydrocarbonds											
Total Petroleum Hydrocarbons - Extractable (DRO)					-		-	-	-	-	-
Total Petroleum Hydrocarbons - Purgeable (GRO)					-		-	-	-	-	-

TABLE D.1

SOIL SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]				*Ecological Screening Levels* [2]	*Ecological Screening Values* [3], [4]	*Ohio EPA VAP Derived Leach-Based Soil Values 2008*				
			Protection of Ground Water					*Table I*		*Table II*	
	Residential Soil	*Industrial Soil*	*Risk-Based SSL*	*MCL-based SSL*			*Soil Type I*	*Soil Type II*	*Soil Type III*	*Sources ≥ ½ Acre*	*Sources < ½ Acre*
	µg/kg	*µg/kg*	*µg/kg*	*µg/kg*	*µg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
Parameter											
Dioxins/Furans											
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)					-		-	-	-	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)					-		-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)					-		-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)					-		-	-	-	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)					-		-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)					-		-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)					-		-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)					-		-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)					-		-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)					-		-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)					-		-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)					-		-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)					-		-	-	-	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)					-		-	-	-	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)					-		-	-	-	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)					0.0386		-	-	-	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.0045	0.018	0.00026	0.015	0.000199		-	-	-	-	-
Total heptachlorodibenzofuran (HpCDF)					-		-	-	-	-	-
Total heptachlorodibenzo-p-dioxin (HpCDD)					-		-	-	-	-	-
Total hexachlorodibenzofuran (HxCDF)					-		-	-	-	-	-
Total hexachlorodibenzo-p-dioxin (HxCDD)					-		-	-	-	-	-
Total pentachlorodibenzofuran (PeCDF)					-		-	-	-	-	-
Total pentachlorodibenzo-p-dioxin (PeCDD)					-		-	-	-	-	-
Total TEQ (ND=0.5)					-		-	-	-	-	-
Total tetrachlorodibenzofuran (TCDF)					-		-	-	-	-	-
Total tetrachlorodibenzo-p-dioxin (TCDD)					-		-	-	-	-	-
General Chemistry											
Asbestos					-		-	-	-	-	-
Cellulose					-		-	-	-	-	-
Chrysotile asbestos					-		-	-	-	-	-
Cyanide (total)	2200	14000	1.4	2000	1330		-	-	-	-	-
Ignitability					-		-	-	-	-	-
Nitrite/Nitrate					-		-	-	-	-	-
pH corrosivity					-		-	-	-	-	-
Reactivity					-		-	-	-	-	-
Sulfide					3.58		-	-	-	-	-
Sulfide (acid soluble)					-		-	-	-	-	-
Temperature, sample					-		-	-	-	-	-
Total solids					-		-	-	-	-	-

Notes:

Chemicals of Concern

- - Not applicable.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL), November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

[2] - United States Environmental Protection Agency RCRA Ecological Screening Levels, August 22, 2003

[3] - G.P. Friday, 1998. Ecological Screening Values for Surface Water, Sediment, and Soil. Wesinghouse Savannah River Company. Report WSRC-TR-98-00110

[4] - USEPA. 2001. Supplemental Guidance to RAGS: Region 4 Bulletins, Ecological Risk Assessment. Originally published November 1995. Website version last updated November 30, 2001: http://www.epa.gov/region4/superfund/programs/riskassess/ecolbul.html

TABLE D.2

GROUNDWATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]		*Ecological Screening Levels* [2]
	Tapwater	*MCL*	
Parameter	µg/L	µg/L	µg/L
Volatile Organic Compounds			
1,1,1-Trichloroethane	750	200	76
1,1,2,2-Tetrachloroethane	0.066		380
1,1,2-Trichloroethane	0.041	5	500
1,1-Dichloroethane	2.4		47
1,1-Dichloroethene	26	7	65
1,2,4-Trichlorobenzene	0.39	70	30
1,2,4-Trimethylbenzene	1.5		-
1,2-Dibromo-3-chloropropane (DBCP)	0.00032	0.2	-
1,2-Dibromoethane (Ethylene dibromide)	0.0065	0.05	-
1,2-Dichlorobenzene	28	600	14
1,2-Dichloroethane	0.15	5	910
1,2-Dichloroethene (total)	13		-
1,2-Dichloropropane	0.38	5	360
1,3-Dichlorobenzene			38
1,4-Dichlorobenzene	0.42	75	9.4
2-Butanone (Methyl ethyl ketone) (MEK)	490		2200
2-Hexanone	3.4		99
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	100		170
Acetone	1200		1700
Benzene	0.39	5	114
Bromodichloromethane	0.12	80	-
Bromoform	7.9	80	230
Bromomethane (Methyl bromide)	0.7		16
Carbon disulfide	72		15
Carbon tetrachloride	0.39	5	240
Chlorobenzene	7.2	100	47
Chloroethane	2100		-
Chloroform (Trichloromethane)	0.19	80	140
Chloromethane (Methyl chloride)	19		-
cis-1,2-Dichloroethene	2.8	70	-
cis-1,3-Dichloropropene			-
Cyclohexane	1300		-
Dibromochloromethane	0.15	80	-
Dichlorodifluoromethane (CFC-12)	19		-
Ethylbenzene	1.3	700	14
Isopropyl benzene	39		-
m&p-Xylenes			-
Methyl acetate	1600		-
Methyl cyclohexane			-
Methyl tert butyl ether (MTBE)	12		-
Methylene chloride	8.4	5	940
o-Xylene	19		-
Styrene	110	100	32
Tetrachloroethene	3.5	5	45
Toluene	86	1000	253
trans-1,2-Dichloroethene	8.6	100	970
trans-1,3-Dichloropropene			-
Trichloroethene	0.26	5	47
Trichlorofluoromethane (CFC-11)	110		-
Trifluorotrichloroethane (Freon 113)	5300		-
Vinyl chloride	0.015	2	930
Xylenes (total)	19	10000	27
Semi-Volatile Organic Compounds			
1,2,4-Trichlorobenzene	0.39	70	30
1,2-Dichlorobenzene	28	600	14
1,3-Dichlorobenzene			38
1,4-Dichlorobenzene	0.42	75	9.4
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	0.31		-
2,4,5-Trichlorophenol	89		-
2,4,6-Trichlorophenol	0.9		4.9
2,4-Dichlorophenol	3.5		11
2,4-Dimethylphenol	27		100
2,4-Dinitrophenol	3		19
2,4-Dinitrotoluene	0.2		44
2,6-Dinitrotoluene	0.042		81
2-Chloronaphthalene	55		0.396
2-Chlorophenol	7.1		24

TABLE D.2

GROUNDWATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]		*Ecological Screening Levels* [2]
	Tapwater	*MCL*	
Parameter	µg/L	µg/L	µg/L
2-Methylnaphthalene	2.7		330
2-Methylphenol	72		67
2-Nitroaniline	15		-
2-Nitrophenol			-
3&4-Methylphenol			-
3,3'-Dichlorobenzidine	0.11		4.5
3-Nitroaniline			-
4,6-Dinitro-2-methylphenol	0.12		23
4-Bromophenyl phenyl ether			1.5
4-Chloro-3-methylphenol	110		34.8
4-Chloroaniline	0.32		232
4-Chlorophenyl phenyl ether			-
4-Methylphenol	140		25
4-Nitroaniline	3.3		-
4-Nitrophenol			60
Acenaphthene	40		38
Acenaphthylene			4840
Acetophenone	150		-
Anthracene	130		0.035
Atrazine	0.26	3	-
Benzaldehyde	150		-
Benzo(a)anthracene	0.029		0.025
Benzo(a)pyrene	0.0029	0.2	0.014
Benzo(b)fluoranthene	0.029		9.07
Benzo(g,h,i)perylene			7.64
Benzo(k)fluoranthene	0.29		-
Biphenyl (1,1-Biphenyl)	0.083		-
bis(2-Chloroethoxy)methane	4.6		-
bis(2-Chloroethyl)ether	0.012		19000
bis(2-Ethylhexyl)phthalate (DEHP)	4.8	6	0.3
Butyl benzylphthalate (BBP)	14		23
Caprolactam	770		-
Carbazole			-
Chrysene	2.9		-
Dibenz(a,h)anthracene	0.0029		-
Dibenzofuran	0.58		4
Diethyl phthalate	1100		110
Dimethyl phthalate			-
Di-n-butylphthalate (DBP)	67		9.7
Di-n-octyl phthalate (DnOP)	16		30
Fluoranthene	63		1.9
Fluorene	22		19
Hexachlorobenzene	0.042	1	0.0003
Hexachlorobutadiene	0.26		0.053
Hexachlorocyclopentadiene	2.2	50	77
Hexachloroethane	0.51		8
Indeno(1,2,3-cd)pyrene	0.029		4.31
Isophorone	67		920
Naphthalene	0.14		13
Nitrobenzene	0.12		220
N-Nitrosodi-n-propylamine	0.0093		-
N-Nitrosodiphenylamine	10		-
Pentachlorophenol	0.035	1	4.0
Phenanthrene			3.6
Phenol	450		180
Pyrene	8.7		0.3
Metals			
Aluminum	1600		-
Aluminum (dissolved)	1600		-
Antimony	0.6	6	80
Antimony (dissolved)	0.6	6	80
Arsenic	0.045	10	148
Arsenic (dissolved)	0.045	10	148
Barium	290	2000	220
Barium (dissolved)	290	2000	220
Beryllium	1.6	4	3.6
Beryllium (dissolved)	1.6	4	3.6

TABLE D.2

GROUNDWATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]		*Ecological Screening Levels* [2]
	Tapwater	*MCL*	
Parameter	µg/L	µg/L	µg/L
Cadmium	0.69	5	0.15
Cadmium (dissolved)	0.69	5	0.15
Calcium			-
Calcium (dissolved)			-
Chromium		100	42
Chromium (dissolved)			42
Cobalt	0.47		24
Cobalt (dissolved)	0.47		24
Copper	62	1300	1.58
Copper (dissolved)	62	1300	1.58
Iron	1100		-
Iron (dissolved)	1100		-
Lead		15	1.17
Lead (dissolved)		15	1.17
Magnesium			-
Magnesium (dissolved)			-
Manganese	32		-
Manganese (dissolved)	32		-
Manganese 2+			-
Mercury	0.063	2	0.0013
Mercury (dissolved)	0.063	2	0.0013
Nickel	30		28.9
Nickel (dissolved)	30		28.9
Potassium			-
Potassium (dissolved)			-
Selenium	7.8	50	5
Selenium (dissolved)	7.8	50	5
Silver	7.1		0.12
Silver (dissolved)	7.1		0.12
Sodium			-
Sodium (dissolved)			-
Thallium	0.016	2	10
Thallium (dissolved)	0.016	2	10
Vanadium	6.3		12
Vanadium (dissolved)	6.3		12
Zinc	470		65.7
Zinc (dissolved)	470		65.7
PCBs			
Aroclor-1016 (PCB-1016)			-
Aroclor-1221 (PCB-1221)			-
Aroclor-1232 (PCB-1232)	0.004		-
Aroclor-1242 (PCB-1242)	0.034		-
Aroclor-1248 (PCB-1248)	0.034		-
Aroclor-1254 (PCB-1254)	0.031		-
Aroclor-1260 (PCB-1260)	0.034		-
Pesticides			
4,4'-DDD	0.027		-
4,4'-DDE	0.2		0.00000000451
4,4'-DDT	0.2		0.000011
Aldrin	0.004		0.017
alpha-BHC	0.0062		12.4
alpha-Chlordane	0.19	2	-
beta-BHC	0.022		0.495
delta-BHC			667
Dieldrin	0.0015		0.000071
Endosulfan I			0.056
Endosulfan II			0.056
Endosulfan sulfate			2.22
Endrin	0.17	2	0.036
Endrin aldehyde			0.15
Endrin ketone			-
gamma-BHC (lindane)	0.036	0.2	0.026
gamma-Chlordane	0.19	2	-
Heptachlor	0.0018	0.4	0.0038
Heptachlor epoxide	0.0033	0.2	0.0038
Methoxychlor	2.7	40	0.019
Toxaphene	0.013	3	0.00014

TABLE D.2

GROUNDWATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [1]		*Ecological Screening Levels* [2]
	Tapwater	*MCL*	
Parameter	µg/L	µg/L	µg/L
Herbicides			
2,4,5-TP (Silvex)	8.4	50	30
2,4-Dichlorophenoxyacetic acid (2,4-D)	13	70	220
Gases			
Ethane			-
Ethene			-
Methane			-
General Chemistry			
Alkalinity, total (as CaCO3)			-
Ammonia-N			-
Chloride			-
Cyanide (total)	0.14	200	5.2
Dissolved organic carbon (DOC)			-
Dissolved organic carbon (DOC) (dissolved)			-
Hardness			-
Nitrate			-
Nitrate (as N)	2500	10000	-
Nitrite			-
Nitrite (as N)	160	1000	-
Sulfate			-
Sulfide			-
Sulfide (acid soluble)			-
Total organic carbon (TOC)			-

Notes:

Chemicals of Concern

- - Not applicable.

[1] - United States Environmental Protection Agency Regional Screening Levels (RSL), November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

[2] - United States Environmental Protection Agency RCRA Ecological Screening Levels, August 22, 2003

TABLE D.3

SOIL GAS SCREENING AND ACTION LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [5]		*Vapor Intrusion Screening Level (VISLs)*		*Soil Vapor Screening Levels (SVSLs)*		*USEPA Regional Screening Levels (RSLs) [5]*								*Ohio Department of Health*							
							Residential Soil Vapor Screening Levels for Further Investigation		*Residential Soil Vapor Screening Levels for Monitoring*		*Industrial Soil Vapor Screening Levels for Further Investigation*		*Industrial Soil Vapor Screening Levels for Monitoring*		*Screening Levels*				*Action Levels*			
Parameter	*Residential Air*	*Industrial Air*	*Residential "Near-source" exterior soil gas [6]*	*Industrial "Near-source" exterior soil gas [6]*	*Residential*	*Industrial*	*Carcinogenic Target ELCR of 10^{-6} assuming DAF=0.1*	*Non-Carcinogenic Target HI of 0.1 assuming DAF=0.1*	*Carcinogenic Target ELCR of 10^{-5} assuming DAF=0.1*	*Non-Carcinogenic, Target HI of 1 assuming DAF=0.1*	*Carcinogenic Target ELCR of 10^{-6} assuming DAF=0.1*	*Non-Carcinogenic Target HI of 0.1 assuming DAF=0.1*	*Carcinogenic Target ELCR of 10^{-5} assuming DAF=0.1*	*Non-Carcinogenic, Target HI of 1 assuming DAF=0.1*	*Residential*		*Non-Residential*		*Residential*		*Non-Residential*	
Units	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*ppb*	*µg/m³*	*ppb*	*µg/m³*	*ppb*	*µg/m³*	*ppb*	*µg/m³*
Volatile Organic Compounds																						
1,1,1-Trichloroethane	520	2200	17333	73333	5200	22000	-	5200	-	52000	-	22000	-	220000	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	0.042	0.21	1	7	0.42	2.1	0.42	-	4.2	-	2.1	-	21	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	0.021	0.088	1	3	0.21	0.88	1.5	0.21	15	2.1	7.7	0.88	77	8.8	-	-	-	-	-	-	-	-
1,1-Dichloroethane	1.5	7.7	50	257	15	77	15	-	150	-	77	-	770	-	37	150	160	630	370	1500	1600	6300
1,1-Dichloroethene	21	88	700	2933	210	880	-	210	-	2100	-	880	-	8800	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	0.21	0.88	7	29	2.1	8.8	-	2.1	-	21	-	8.8	-	88	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	0.73	3.1	24	103	7.3	31	-	7.3	-	73	-	31	-	310	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	0.00016	0.002	0.0053	0.0667	0.0016	0.02	0.0016	0.21	0.016	2.1	0.02	0.88	0.20	8.8	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	0.0041	0.02	0.1367	0.6667	0.041	0.2	0.041	9.4	0.41	94	0.20	39	2.0	390	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	21	88	700	2933	210	880	-	210	-	2100	-	880	-	8800	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.094	0.47	3	16	0.94	4.7	0.94	7.3	9.4	73	4.7	31	47	310	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	0.24	1.2	8	40	2.4	12	2.4	4.2	24	42	12	18	120	180	-	-	-	-	-	-	-	-
1,2-Dichlorotetrafluoroethane (CFC 114)					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Butadiene	0.081	0.41	3	14	0.81	4.1	0.81	2.1	8.1	21	4.1	8.8	41	88	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene[1]	0.22	1.1	7	37	2.2	11	2.2	830	22	8300	11	3500	110	35000	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.22	1.1	7	37	2.2	11	2.2	830	22	8300	11	3500	110	35000	-	-	-	-	-	-	-	-
1,4-Dioxane	0.49	2.5	16	83	4.9	25	3.2	3100	32	31000	16	13000	160	130000	-	-	-	-	-	-	-	-
2,2,4-Trimethylpentane					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	520	2200	17333	73333	5200	22000	-	5200	-	52000	-	22000	-	220000	-	-	-	-	-	-	-	-
2-Chlorotoluene					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	3.1	13	103	433	31	130	-	31	-	310	-	130	-	1300	-	-	-	-	-	-	-	-
2-Phenylbutane (sec-Butylbenzene)					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Ethyl toluene							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	310	1300	10333	43333	3100	13000	-	3100	-	31000	-	13000	-	130000	-	-	-	-	-	-	-	-
Acetone	3200	14000	106667	466667	32000	140000	-	32000	-	320000	-	140000	-	1400000	-	-	-	-	-	-	-	-
Allyl chloride	0.1	0.44	3	15	1	4.4	4.1	1	41	10	20	4.4	200	44	-	-	-	-	-	-	-	-
Benzene	0.31	1.6	10	53	3.1	16	3.1	31	31	310	16	130	160	1300	4	10	20	40	40	100	200	400
Benzyl chloride	0.05	0.25	2	8	0.5	2.5	0.5	1	5	10	2.5	4.4	25	44	-	-	-	-	-	-	-	-
Bromodichloromethane	0.066	0.33	2	11	0.66	3.3	0.66	-	6.6	-	3.3	-	33	-	-	-	-	-	-	-	-	-
Bromoform	2.2	11	73	367	22	110	22	-	220	-	110	-	1100	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	0.52	2.2	17	73	5.2	22	-	5.2	-	52	-	22	-	220	-	-	-	-	-	-	-	-
Butane					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	73	310	2433	10333	730	3100	-	730	-	7300	-	3100	-	31000	-	-	-	-	-	-	-	-
Carbon tetrachloride	0.41	2	14	67	4.1	20	4.1	100	41	1000	20	440	200	4400	-	-	-	-	-	-	-	-
Chlorobenzene	5.2	22	173	733	52	220	-	52	-	520	-	220	-	2200	-	-	-	-	-	-	-	-
Chlorodifluoromethane	5200	22000	173333	733333	52000	220000	-	52000	-	520000	-	220000	-	2200000	-	-	-	-	-	-	-	-
Chloroethane	1000	4400	33333	146667	10000	44000	-	10000	-	100000	-	44000	-	440000	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	0.11	0.53	4	18	1.1	5.3	1.1	100	11	1000	5.3	430	53	4300	200	1000	800	4000	2000	10000	8000	40000
Chloromethane (Methyl chloride)	9.4	39	313	1300	94	390	-	94	-	940	-	390	-	3900	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene[2]	6.3	26	210	867	63	260	-	63	-	630	-	260	-	2600	88	350	370	1500	880	3500	3700	15000
cis-1,3-Dichloropropene[3]	0.61	3.1	20	103	6.1	31	6.1	21	61	210	31	88	310	880	-	-	-	-	-	-	-	-
Cyclohexane	630	2600	21000	86667	6300	26000	-	6300	-	63000	-	26000	-	260000	-	-	-	-	-	-	-	-
Cymene (p-Isopropyltoluene)							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	0.09	0.45	3	15	0.9	4.5	0.9	-	9.0	-	4.5	-	45	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	10	44	333	1467	100	440	-	100	-	1000	-	440	-	4400	-	-	-	-	-	-	-	-
Ethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethene							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.97	4.9	32	163	9.7	49	9.7	1000	97	10000	49	4400	490	44000	600	3000	2500	13000	6000	30000	25000	130000
Helium							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	0.11	0.56	4	19	1.1	5.6	1.1	-	11	-	5.6	-	56	-	-	-	-	-	-	-	-	-
Hexane	73	310	2433	10333	730	3100	-	730	-	7300	-	3100	-	31000	-	-	-	-	-	-	-	-
Isopropyl alcohol	730	3100	24333	103333	7300	31000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropyl benzene	42	180	1400	6000	420	1800	-	420	-	4200	-	1800	-	18000	-	-	-	-	-	-	-	-
m&p-Xylenes					0	0	-	100	-	1000	-	440	-	4400	500	2000	2000	8000	5000	20000	20000	80000
Methyl methacrylate	73	310	2433	10333	730	3100	-	730	-	7300	-	3100	-	31000	-	-	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	9.4	47	313	1567	94	470	94	3100	940	31000	470	13000	4700	130000	-	-	-	-	-	-	-	-
Methylene chloride	63	260	2100	8667	630	2600	960	630	9600	6300	12000	2600	120000	26000	-	-	-	-	-	-	-	-
Naphthalene	0.072	0.36	2	12	0.72	3.6	0.72	3.1	7.2	31	3.6	13	36	130	7	36.7	29	152	-	-	-	-
N-Butylbenzene							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE D.3

SOIL GAS SCREENING AND ACTION LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	USEPA Regional Screening Levels (RSLs) [5]		*Vapor Intrusion Screening Level (VISLs)*		*Soil Vapor Screening Levels (SVSLs)*		*USEPA Regional Screening Levels (RSLs) [5]*								*Ohio Department of Health*							
	Residential Air	*Industrial Air*	*Residential "Near-source" exterior soil gas [6]*	*Industrial "Near-source" exterior soil gas [6]*	*Residential*	*Industrial*	*Residential Soil Vapor Screening Levels for Further Investigation*		*Residential Soil Vapor Screening Levels for Monitoring*		*Industrial Soil Vapor Screening Levels for Further Investigation*		*Industrial Soil Vapor Screening Levels for Monitoring*		*Screening Levels*				*Action Levels*			
Parameter							*Carcinogenic Target ELCR of 10^{-6} assuming DAF=0.1*	*Non-Carcinogenic Target HI of 0.1 assuming DAF=0.1*	*Carcinogenic Target ELCR of 10^{-5} assuming DAF=0.1*	*Non-Carcinogenic, Target HI of 1 assuming DAF=0.1*	*Carcinogenic Target ELCR of 10^{-6} assuming DAF=0.1*	*Non-Carcinogenic Target HI of 0.1 assuming DAF=0.1*	*Carcinogenic Target ELCR of 10^{-5} assuming DAF=0.1*	*Non-Carcinogenic, Target HI of 1 assuming DAF=0.1*	*Residential*		*Non-Residential*		*Residential*		*Non-Residential*	
Units	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*ppb*	*µg/m³*	*ppb*	*µg/m³*	*ppb*	*µg/m³*	*ppb*	*µg/m³*
N-Decane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Dodecane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Heptane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonane	2.1	8.8	70	293	21	88	-	210	-	2100	-	880	-	8800	-	-	-	-	-	-	-	-
N-Propylbenzene	100	440	3333	14667	1000	4400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Undecane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Octane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	10	44	333	1467	100	440	-	100	-	1000	-	440	-	4400	500	2000	2000	8000	5000	20000	20000	80000
Pentane	100	440	3333	14667	1000	4400	-	1000	-	10000	-	4400	-	44000	-	-	-	-	-	-	-	-
Styrene	100	440	3333	14667	1000	4400	-	1000	-	10000	-	4400	-	44000	-	-	-	-	-	-	-	-
tert-Butyl alcohol					0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	4.2	18	140	600	42	180	94	42	940	420	470	180	4700	1800	60	400	250	1700	600	4000	2500	17000
Tetrahydrofuran	210	880	7000	29333	2100	8800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	520	2200	17333	73333	5200	22000	-	5200	-	52000	-	22000	-	220000	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	6.3	26	210	867	63	260	-	63	-	630	-	260	-	2600	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene[4]	0.61	3.1	20	103	6.1	31	6.1	21	61	210	31	88	310	880	-	-	-	-	-	-	-	-
Trichloroethene	0.21	0.88	7	29	2.1	8.8	4.3	2.1	43	21	30	8.8	300	88	4	20	20	100	40	200	200	1000
Trichlorofluoromethane (CFC-11)	73	310	2433	10333	730	3100	-	730	-	7300	-	3100	-	31000	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	3100	13000	103333	433333	31000	130000	-	31000	-	310000	-	130000	-	1300000	-	-	-	-	-	-	-	-
Vinyl bromide (Bromoethene)	0.076	0.38	3	13	0.76	3.8	0.76	3.1	7.6	31	3.8	13	38	130	-	-	-	-	-	-	-	-
Vinyl chloride	0.16	2.8	5	93	1.6	28	1.6	100	16	1000	28	440	280	4400	4	10	20	40	40	100	200	400
Xylenes (total)	10	44	333	1467	100	440	-	100	-	1000	-	440	-	4400	-	-	-	-	-	-	-	-
Radiology																						
Radon-222							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons																						
Total hydrocarbons - FID							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total hydrocarbons - PID							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gases																						
Methane	0.5	0.5	17	17			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Field Parameters																						
Barometric pressure							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon dioxide							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lower explosive limit							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methane, field	0.5	0.5	17	17			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Oxygen							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PID reading							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pressure							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, ambient							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Chemicals of Concern

- - Not applicable.

[1] - An RSL is not available for 1,3-dichlorobenzene; the RSL for 1,4-dichlorobenzene was considered an evaluation surrogate for 1,3-dichlorobenzene.

[2] - An RSL is not available for cis-1,2-dichloroethene; the RSL for trans-1,2-dichloroethene was considered an evaluation surrogate for cis-1,2-dichloroethene.

[3] - An RSL is not available for cis-1,3-dichloropropene; the RSL for 1,3-dichloropropene was considered an evaluation surrogate for cis-1,3-dichloropropene.

[4] - An RSL is not available for trans-1,3-dichloropropene; the RSL for 1,3-dichloropropene was considered an evaluation surrogate for trans-1,3-dichloropropene.

[5] - United States Environmental Protection Agency Regional Screening Levels (RSL), November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

[6] - The VISLs are based on the USEPA RSLs by applying the 'OSWER Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air' (USEPA, 2013) default "near-source" exterior soil gas to indoor air attenuation factor of 0.03.

TABLE D.4

SURFACE WATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	Ecological Screening Levels [1]	*Ecological Screening Values* [4,5]		*Aquatic Life* [2]			*Human Health* [2]		*Water Quality Criteria* [3]	
			Tier	IMZM	OMZM	OMZA	Drink	Nondrink	Water + Organism	Organism Only
Parameter	*mg/L*	*µg/L*		*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Volatile Organic Compounds										
1,1,1-Trichloroethane	0.076	528	II	1400	690	76	200a			
1,1,2,2-Tetrachloroethane	0.38	240	II	1800	910	260	1.7c	110c	0.17	4.0
1,1,2-Trichloroethane	0.5	940	II	6600	3300	740	5.0a,c	420c	0.59	16
1,1-Dichloroethane	0.047	47		ID	ID	ID				
1,1-Dichloroethene	0.065	303	II	3800	1900	210	0.57c	32c	330	7100
1,2,4-Trichlorobenzene	0.03	44.9					70a	940	35	70
1,2,4-Trimethylbenzene	-		II	280	140	15				
1,2-Dibromo-3-chloropropane (DBCP)	-			ID	ID	ID	0.2a			
1,2-Dibromoethane (Ethylene dibromide)	-			ID	ID	ID	0.050a			
1,2-Dichlorobenzene	0.014	15.8	II	260	130	23	600a	17000	420	1300
1,2-Dichloroethane	0.91	2000	II	19000	9600	2000	3.8c	990c	0.38	37
1,2-Dichloroethene (total)	-		II	18000	8800	970	See criteria for individual chemicals			
1,2-Dichloropropane	0.36	525	II	6500	3300	520	5.0a,c	390c	0.5	15
1,3-Dichlorobenzene	0.038	50.2	II	160	79	22	400	2600	320	960
1,4-Dichlorobenzene	0.0094	11.2	II	110	57	9.4	75a	2600	63	190
2-Butanone (Methyl ethyl ketone) (MEK)	2.2	14000	II	400000	200000	22000				
2-Hexanone	0.099	99								
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	0.17	170		ID	ID	ID				
Acetone	1.7	1500								
Benzene	0.114	53	II	1400	700	160	5.0a,c	710c	2.2	51
Bromodichloromethane	-			ID	ID	ID	5.6c	460c	0.55	17
Bromoform	0.23	293							4.3	140
Bromomethane (Methyl bromide)	0.016	110	II	75	38	16	48	4000	47	1500
Carbon disulfide	0.015	0.92	II	260	130	15				
Carbon tetrachloride	0.24	352	II	4400	2200	240	2.5c	44c	0.23	1.6
Chlorobenzene	0.047	195	II	850	420	47	100a	21000	130	1600
Chloroethane	-									
Chloroform (Trichloromethane)	0.14	289	II	2600	1300	140	57c	4,700c	5.7	470
Chloromethane (Methyl chloride)	-	5500								
cis-1,2-Dichloroethene	-		II	18000	8800	970	70a			
cis-1,3-Dichloropropene	-		II	30	15	1.7	10	1700		
Cyclohexane	-									
Dibromochloromethane	-			ID	ID	ID	4.1c	340c	0.4	13
Dichlorodifluoromethane (CFC-12)	-			ID	ID	ID				
Ethylbenzene	0.014	453	II	1100	550	61	700a	29000	530	2100
Isopropyl benzene	-		II	86	43	4.8				
m&p-Xylenes	-									
Methyl acetate	-									
Methyl cyclohexane	-									
Methyl tert butyl ether (MTBE)	-		II	13000	6500	730				
Methylene chloride	0.94	1930	II	22000	11000	1900	5.0c	16,000c	4.6	590
o-Xylene	-									
Styrene	0.032		II	570	290	32	100a			
Tetrachloroethene	0.045	84	II	850	430	53	5.0a,c	89c	0.69	3.3
Toluene	0.253	175	II	1100	560	62	1,000a	200000	1300	15000
trans-1,2-Dichloroethene	0.97		II	18000	8800	970	100a	140000	140	10000
trans-1,3-Dichloropropene	-		II	30	15	1.7	10	1700		
Trichloroethene	0.047	47	II	4000	2000	220	5.0a,c	810c	2.5	30
Trichlorofluoromethane (CFC-11)	-									
Trifluorotrichloroethane (Freon 113)	-									
Vinyl chloride	0.93		II	17000	8400	930	2.0a,c	5,300c	0.025	2.4
Xylenes (total)	0.027	13								
			II	480	240	27	10,000a			

TABLE D.4

SURFACE WATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	Ecological Screening Levels [1]	*Ecological Screening Values* [4,5]		*Aquatic Life* [2]			*Human Health* [2]		*Water Quality Criteria* [3]	
			Tier	IMZM	OMZM	OMZA	Drink	Nondrink	Water + Organism	Organism Only
Parameter	*mg/L*	*µg/L*		*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Semi-Volatile Organic Compounds										
1,2,4-Trichlorobenzene	0.03	44.9							35	70
1,2-Dichlorobenzene	0.014	15.8							420	1300
1,3-Dichlorobenzene	0.038	50.2							320	960
1,4-Dichlorobenzene	0.0094	11.2							63	190
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-								1400	65000
2,4,5-Trichlorophenol	-						2600	9800	1800	3600
2,4,6-Trichlorophenol	0.0049	3.2	II	79	39	4.9	21c	65c	1.4	2.4
2,4-Dichlorophenol	0.011	36.5	II	210	110	11	0.3f	790	77	290
2,4-Dimethylphenol	0.1	21.2	II	280	140	15	540	2300	380	850
2,4-Dinitrophenol	0.019	6.2							69	5300
2,4-Dinitrotoluene	0.044	310	II	790	390	44	1.1c	91c	0.11	3.4
2,6-Dinitrotoluene	0.081		II	1500	730	81				
2-Chloronaphthalene	0.000396								1000	1600
2-Chlorophenol	0.024	43.8	II	580	290	32	0.1f	400	81	150
2-Methylnaphthalene	0.33									
2-Methylphenol	0.067	13	II	1200	600	67				
2-Nitroaniline	-									
2-Nitrophenol	-	3500	II	1300	650	73				
3-Methylphenol			II	1100	560	62				
3&4-Methylphenol	-									
3,3'-Dichlorobenzidine	0.0045						0.40c	0.77c	0.021	0.028
3-Nitroaniline	-									
4,6-Dinitro-2-methylphenol	0.023						13	770		
4-Bromophenyl phenyl ether	0.0015									
4-Chloro-3-methylphenol	0.0348									
4-Chloroaniline	0.232									
4-Chlorophenyl phenyl ether	-									
4-Methylphenol	0.025		II	960	480	53				
4-Nitroaniline	-									
4-Nitrophenol	0.06	82.8								
Acenaphthene	0.038	17	I	38	19	15	1200	2700	670	990
Acenaphthylene	4.84									
Acetophenone	-									
Anthracene	0.000035	0.73	II	0.35	0.18	0.02	9600	110000	8300	40000
Atrazine	-	1.8					3.0a			
Benzaldehyde	-									
Benzo(a)anthracene	0.000025	0.02		ID	ID	ID	0.044c	0.49c	0.0038	0.018
Benzo(a)pyrene	0.000014	0.014		ID	ID	ID	0.044c	0.49c	0.0038	0.018
Benzo(b)fluoranthene	0.00907			ID	ID	ID	0.044c	0.49c	0.0038	0.018
Benzo(g,h,i)perylene	0.00764			ID	ID	ID				
Benzo(k)fluoranthene	-			ID	ID	ID	0.044c	0.49c	0.0038	0.018
Biphenyl (1,1-Biphenyl)	-	14	II	51	26	6.5				
bis(2-Chloroethoxy)methane	-									
bis(2-Chloroethyl)ether	19	2380					0.31c	14c	0.03	0.53
bis(2-Ethylhexyl)phthalate (DEHP)	0.0003	0.3	II	2100	1100	8.4	6.0a,c	59c	1.2	2.2
Butyl benzylphthalate (BBP)	0.023	22							1500	1900
Caprolactam	-									
Carbazole	-									
Chrysene	-			ID	ID	ID	0.044c	0.49c	0.0038	0.018
Dibenz(a,h)anthracene	-			ID	ID	ID	0.044c	0.49c	0.0038	0.018
Dibenzofuran	0.004	3.7	II	71	36	4				
Diethyl phthalate	0.11	521	II	2000	980	220	23000	120000	17000	44000
Dimethyl phthalate	-	330	II	6400	3200	1100	310000	2900000	270000	1100000
Di-n-butylphthalate (DBP)	0.0097	9.4					2700	12000	2000	4500
Di-n-octyl phthalate (DnOP)	0.03	708								
Fluoranthene	0.0019	39.8	II	7.4	3.7	0.8	300	370	130	140

TABLE D.4

SURFACE WATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	Ecological Screening Levels [1]	*Ecological Screening Values* [4,5]		*Aquatic Life* [2]			*Human Health* [2]		*Water Quality Criteria* [3]	
			Tier	IMZM	OMZM	OMZA	Drink	Nondrink	Water + Organism	Organism Only
Parameter	*mg/L*	*µg/L*		*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Fluorene	0.019	3.9	I,I,II	220	110	19	1300	14000	1100	5300
Hexachlorobenzene	0.0000003						0.0075c	0.0077c	0.00028	0.00029
Hexachlorobutadiene	0.000053	0.93					4.4c	500c	0.44	18
Hexachlorocyclopentadiene	0.077	0.07					50a	17000	40	1100
Hexachloroethane	0.008	9.8					19c	89c	1.4	3.3
Indeno(1,2,3-cd)pyrene	0.00431			ID	ID	ID	0.044c	0.49c	0.0038	0.018
Isophorone	0.92	1170	II	15000	7500	920	360c	26,000c	35	960
Naphthalene	0.013	62	II	340	170	21				
Nitrobenzene	0.22	270	II	4000	2000	380	17	1900	17	690
N-Nitrosodi-n-propylamine	-						0.050c	14c	0.0050	0.51
N-Nitrosodiphenylamine	-	58.5					50c	160c	3.3	6.0
Pentachlorophenol	0.004	13	I		Table 7-10		1.0a,c	82c	0.27	3
Phenanthrene	0.0036	0.4	II	61	31	2.3				
Phenol (wwh, ewh, mwh)			I,I,II	9400	4700	400	1.0f	4600000		
Phenol (lrw)			I,I,II	9400	4700	NA	1.0f	4600000		
Phenol (cwh, ssh)			I,I,II	9100	4600	160	1.0f	4600000		
Phenol	0.18	256							10000	860000
Pyrene	0.0003	0.02	II	83	42	4.6	960	11000	830	4000
PCBs										
PCBs (total)		0.14					0.0017c	0.0017c		
Aroclor-1016 (PCB-1016)	-	0.014								
Aroclor-1221 (PCB-1221)	-	0.014								
Aroclor-1232 (PCB-1232)	-	0.014								
Aroclor-1242 (PCB-1242)	-	0.014								
Aroclor-1248 (PCB-1248)	-	0.014								
Aroclor-1254 (PCB-1254)	-	0.014								
Aroclor-1260 (PCB-1260)	-	0.014								
Pesticides										
4,4'-DDD	-	00064					0.0083c	0.0084c	0.00031	0.00031
4,4'-DDE	0.000000000000451	10.5					0.0059c	0.0059c	0.00022	0.00022
4,4'-DDT	0.000000011	0.001					0.0059c	0.0059c	0.00022	0.00022
Aldrin	0.000017	0.3					0.0013c	0.0014c	0.000049	0.000050
alpha-BHC	0.0124	500					0.039c	0.13c	0.0026	0.0049
alpha-Chlordane	-									
beta-BHC	0.000495	5000					0.14c	0.46c	0.0091	0.017
delta-BHC	0.667								0.0123	0.0414
Dieldrin	0.000000071	0.0019							0.000052	0.000054
Endosulfan							110	240		
Endosulfan I	0.000056						110	240	62	89
Endosulfan II	0.000056						110	240	62	89
Endosulfan sulfate	0.00222						110	240	62	89
Endrin	0.000036	0.0023	I	0.17	0.086	0.036	0.76	0.81	0.059	0.06
Endrin aldehyde	0.00015						0.76	0.81	0.29	0.3
Endrin ketone	-									
gamma-BHC (lindane)	0.000026	0.08	I,I,II	1.9	0.95	0.057	0.19c	0.63c	0.98	1.8
gamma-Chlordane	-									
Heptachlor	0.0000038	0.0038					0.0021c	0.0021c	0.000079	0.000079
Heptachlor epoxide	0.0000038	0.0038					0.0010c	0.0011c	0.000039	0.000039
Methoxychlor	0.000019	0.03					40a		100	
Toxaphene	0.00000014	0.0002					0.0073c	0.0075c	0.00028	0.00028
Herbicides										
2,4,5-TP (Silvex)	0.03									
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.22								100	

TABLE D.4

SURFACE WATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	Ecological Screening Levels [1]	*Ecological Screening Values* [4], [5]		*Aquatic Life* [2]			*Human Health* [2]		*Water Quality Criteria* [3]	
			Tier	IMZM	OMZM	OMZA	Drink	Nondrink	Water + Organism	Organism Only
Parameter	*mg/L*	*µg/L*		*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Gases										
Ethane	-									
Ethene	-									
Methane	-									
Metals										
Aluminum	-	87								
Aluminum (dissolved)	-	87								
Antimony	0.08	160	II	1800	900	190	6.0a	4300	5.6	640
Antimony (dissolved)	0.08	160							5.6	640
Arsenic	0.148	5	I	680	340	150	10a		0.018	0.14
Arsenic (dissolved)	0.148	5	I	680	340	150			0.018	0.14
Barium	0.22	4	II	4000	2000	220	2,000a		1000	
Barium (dissolved)	0.22	4							1000	
Beryllium	0.0036	0.53	II	g	g	g	4.0a	280		
Beryllium (dissolved)	0.0036	0.53								
Cadmium	0.00015	0.66	I		Table 7-9		5.0a			
Cadmium (dissolved)	0.00015	0.6	I		Table 7-9					
Calcium	-	116000								
Calcium (dissolved)	-	116000								
Chromium	0.042		I		Table 7-9		100a			
Chromium (dissolved)	0.042		I		Table 7-9					
Cobalt	0.024	23	II	440	220	24				
Cobalt (dissolved)	0.024	23								
Copper	0.00158	6.54			Table 7-9			1,300	1300	
Copper (dissolved)	0.00158	6.54			Table 7-9				1300	
Iron	-	1000								
Iron (dissolved)	-	1000					300a			
Lead	0.00117	1.32	I		Table 7-9		ID	ID		
Lead (dissolved)	0.00117	1.32	I		Table 7-9					
Magnesium	-	82000								
Magnesium (dissolved)	-	82000								
Manganese	-	120							50	100
Manganese (dissolved)	-	120							50	100
Manganese 2+	-									
Mercury	0.0000013	0.012	I	3.4	1.7	0.91	0.012	0.012		
Mercury (dissolved)	0.0000013	0.012	I	2.9	1.4	0.77				
Nickel	0.0289	87.7			Table 7-9		610	4600	610	4600
Nickel (dissolved)	0.0289	87.7			Table 7-9				610	4600
Potassium	-	53000								
Potassium (dissolved)	-	53000								
Selenium	0.005	5.0	I			5.0	50a	11000	170	4200
Selenium (dissolved)	0.005	5.0	I			4.6			170	4200
Silver	0.00012	0.012								
Silver (wwh, ewh, mwh) - TR			I	h	h	1.3	50			
Silver (lrw) - TR			I	h	h		50			
Silver (ssh, cwh) - TR			I	h	h	0.06	50			
Silver (dissolved)	0.00012	0.012	I			ID				
Sodium	-	680000								
Sodium (dissolved)	-	680000								
Thallium	0.01	4.0	II	160	79	17	1.7	6.3	0.24	0.47
Thallium (dissolved)	0.01	4.0							0.24	0.47
Vanadium	0.012	20	II	300	150	44				
Vanadium (dissolved)	0.012	20								
Zinc	0.0657	58.9	I		Table 7-9		9100	69000	7400	26000
Zinc (dissolved)	0.0657	58.9	I		Table 7-9				7400	26000

TABLE D.4

SURFACE WATER SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

	Ecological Screening Levels [1]	*Ecological Screening Values* [4], [5]		*Aquatic Life* [2]			*Human Health* [2]		*Water Quality Criteria* [3]	
			Tier	IMZM	OMZM	OMZA	Drink	Nondrink	Water + Organism	Organism Only
Parameter	*mg/L*	*µg/L*		*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
General Chemistry										
Alkalinity, total (as CaCO3)	-									
Ammonia-N	-	1000								
Chloride	-	230000					250,000a			
Cyanide (total)	0.0052	5.2							140	140
Cyanide - free (wwh, ewh, mwh)			I	92	46	12	200a	220000		
Cyanide - free (lwh)			I	92	46	NA	200a	220000		
Cyanide - free (ssh, cwh)			I	45	22	5.2	200a	220000		
Dissolved organic carbon (DOC)	-									
Dissolved organic carbon (DOC) (dissolved)	-									
Hardness	-									
Nitrate + Nitrite (as N)							10,000a			
Nitrate	-									
Nitrate (as N)	-								10000	
Nitrite	-									
Nitrite (as N)	-						1,000a			
Sulfate	-						250,000a			
Sulfide	-	2.0								
Sulfide (acid soluble)	-									
Total organic carbon (TOC)	-									

Notes:

Chemicals of Concern
- - Not applicable.
[1] - United States Environmental Protection Agency RCRA Ecological Screening Levels, August 22, 2003

[2] - Ohio River Basin Aquatic Life and Human Health Tier 1 Criteria and Tier II Values
[3] - USEPA National Recommended Water Quality Criteria - Human Health Criteria Table
[4] - USEPA. 2001. Supplemental Guidance to RAGS: Region 4 Bulletins, Ecological Risk Assessment. Originally published November 1995. Website version last updated November 30, 2001 http://www.epa.gov/region4/superfund/programs/riskassess/ecolbul.html
[5] - G.P. Friday, 1998. Ecological Screening Values for Surface Water, Sediment, and Soil. Wesinghouse Savannah River Company. Report WSRC-TR-98-00110
ID - Insufficient data available to calculate criterion
NA - Not applicable.
IMNM - Inside Mixing Zone Maximum
OMZM - Outside Mixing Zone Maximum.
OMZA - Outside Mixing Zone Average.
Drink - Human health criterion applicable to Public Water Supply streams (2-route exposure).
Nondrink - Human health criterion - non Public Water Supply (1-route exposure).
a - This criterion is the maximum contaminant level (MCL) developed under the "Safe Drinking Water Act".
b - No chlorine is to be discharged.
c - This criterion is based on a carcinogenic endpoint.
d - Equivalent 25°C specific conductance value is 2400 micromhos/cm.
e - Equivalent 25°C specific conductance values are 1200 micromhos/cm as a maximum and 800 micromhos/cm as a thirty-day average.
f - This criterion is based on protection against adverse aesthetic effects.

TABLE D.5

SEDIMENT SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Parameter	*USEPA Ecological Screening Levels* [1] *µg/kg*	*Concensus-Based TEC Values* [2] *µg/kg*	*Ecological Screening Values* [3][4] *µg/kg*
Volatile Organic Compounds			
1,1,1-Trichloroethane	213		170
1,1,2,2-Tetrachloroethane	850		940
1,1,2-Trichloroethane	518		
1,1-Dichloroethane	0.575		
1,1-Dichloroethene	19.4		
1,2-Dichloroethane	260		400
1,2-Dichloroethene (total)	-		
1,2-Dichloropropane	333		
2-Butanone (Methyl ethyl ketone) (MEK)	42.4		
2-Hexanone	58.2		
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	25.1		
Acetone	9.9		
Benzene	142		50
Bromodichloromethane	-		
Bromoform	492		
Bromomethane (Methyl bromide)	1.37		
Carbon disulfide	23.9		
Carbon tetrachloride	1450		
Chlorobenzene	291		820
Chloroethane	-		
Chloroform (Trichloromethane)	121		1.0
Chloromethane (Methyl chloride)	-		
cis-1,3-Dichloropropene	-		
Dibromochloromethane	-		
Ethylbenzene	175		50
Methylene chloride	159		2000
Styrene	254		100
Tetrachloroethene	990		10
Toluene	1220		50
trans-1,3-Dichloropropene	-		
Trichloroethene	112		1.0
Vinyl chloride	202		10
Xylenes (total)	433		50
Semi-Volatile Organic Compounds			
1,2,4-Trichlorobenzene	5062		9200
1,2-Dichlorobenzene	294		300
1,3-Dichlorobenzene	1315		1700
1,4-Dichlorobenzene	318		350
2,4,5-Trichlorophenol	-		
2,4,6-Trichlorophenol	208		
2,4-Dichlorophenol	81.7		
2,4-Dimethylphenol	304		

TABLE D.5

SEDIMENT SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Parameter	*USEPA Ecological Screening Levels* [1] *µg/kg*	*Concensus-Based TEC Values* [2] *µg/kg*	*Ecological Screening Values* [3][4] *µg/kg*
2,4-Dinitrophenol	6.21		
2,4-Dinitrotoluene	14.4		
2,6-Dinitrotoluene	39.8		
2-Chloronaphthalene	417		1000
2-Chlorophenol	31.9		
2-Methylnaphthalene	20.2		330
2-Methylphenol	55.4		
2-Nitroaniline	-		
2-Nitrophenol	-		
3,3'-Dichlorobenzidine	127		
3-Nitroaniline	-		
4,6-Dinitro-2-methylphenol	104		
4-Bromophenyl phenyl ether	1550		
4-Chloro-3-methylphenol	388		
4-Chloroaniline	146		
4-Chlorophenyl phenyl ether	-		
4-Methylphenol	20.2		
4-Nitroaniline	-		
4-Nitrophenol	13.3		
Acenaphthene	6.71		330
Acenaphthylene	5.87		330
Anthracene	57.2	57.2	330
Benzo(a)anthracene	108	108	330
Benzo(a)pyrene	150	150	330
Benzo(b)fluoranthene	10400		
Benzo(g,h,i)perylene	170		
Benzo(k)fluoranthene	240		
bis(2-Chloroethoxy)methane	-		
bis(2-Chloroethyl)ether	3520		
bis(2-Ethylhexyl)phthalate (DEHP)	182		182
Butyl benzylphthalate (BBP)	1970		11000
Carbazole	-		
Chrysene	166	166	330
Dibenz(a,h)anthracene	33	33.0	330
Dibenzofuran	449		2000
Diethyl phthalate	295		630
Dimethyl phthalate	-		
Di-n-butylphthalate (DBP)	1114		11000
Di-n-octyl phthalate (DnOP)	40600		
Fluoranthene	423	423	330
Fluorene	77.4	77.4	330
Hexachlorobenzene	20		2.5
Hexachlorobutadiene	26.5		
Hexachlorocyclopentadiene	901		

TABLE D.5

SEDIMENT SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Parameter	*USEPA Ecological Screening Levels* [1] *µg/kg*	*Concensus-Based TEC Values* [2] *µg/kg*	*Ecological Screening Values* [3][4] *µg/kg*
Hexachloroethane	584		1000
Indeno(1,2,3-cd)pyrene	200		
Isophorone	432		
Naphthalene	176	176	330
Nitrobenzene	145		
N-Nitrosodi-n-propylamine	-		
N-Nitrosodiphenylamine	-		
Pentachlorophenol	23000		2.0
Phenanthrene	204	204	330
Phenol	49.1		50
Pyrene	195	195	330
Total low molecular weight (LMW)			330
Total high molecular weight (HMW)			655
Total PAHs		1610	1684
Metals			
Aluminum	-		
Antimony	-		12000
Arsenic	9790	9790	7240
Barium	-		200000
Beryllium	-		
Cadmium	990	990	1000
Calcium	-		
Chromium	43400	43400	52300
Cobalt	50000		20000
Copper	31600	31600	18700
Cyanide (total)	0.1		
Iron	-		
Lead	35800	35800	30200
Magnesium	-		
Manganese	-		
Mercury	174	180	130
Nickel	22700	22700	15900
Potassium	-		
Selenium	-		
Silver	500		2000
Sodium	-		
Thallium	-		
Vanadium	-		
Zinc	121000	12100	12400
PCBs			
Aroclor-1016 (PCB-1016)	-		
Aroclor-1221 (PCB-1221)	-		67

TABLE D.5

SEDIMENT SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Parameter	*USEPA Ecological Screening Levels* [1] *µg/kg*	*Concensus-Based TEC Values* [2] *µg/kg*	*Ecological Screening Values* [3][4] *µg/kg*
Aroclor-1232 (PCB-1232)	-		
Aroclor-1242 (PCB-1242)	-		
Aroclor-1248 (PCB-1248)	-		
Aroclor-1254 (PCB-1254)	-		60
Aroclor-1260 (PCB-1260)	-		
Total PCBs		59.8	33
Pesticides			
4,4'-DDD	4.88	4.88	3.3
4,4'-DDE	3.16	3.16	3.3
4,4'-DDT	4.16	4.16	3.3
Aldrin	2		2.5
alpha-BHC	6		
alpha-Chlordane	-		
beta-BHC	5		
delta-BHC	71500		
Dieldrin	1.9	1.90	3.3
Endosulfan I	3.26		
Endosulfan II	1.94		
Endosulfan sulfate	34.6		
Endrin	2.22	2.22	3.3
Endrin aldehyde	480		
Endrin ketone	-		
gamma-BHC (lindane)	2.37	2.37	
gamma-Chlordane	-		
Heptachlor	0.6		
Heptachlor epoxide	2.47	2.47	0.6
Methoxychlor	13.6		19
Toxaphene	0.077		28
General Chemistry			
Percent moisture	-		
Total organic carbon (TOC)	-		

Notes:
- - Not applicable.
[1] - United States Environmental Protection Agency RCRA Ecological Screening Levels, August 22, 2003
[2] - MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000a. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39:20-21
[3] - USEPA. 2001. Supplemental Guidance to RAGS: Region 4 Bulletins, Ecological Risk Assessment. Originally published November 1995. Website version last updated November 30, 2001: http://www.epa.gov/region4/superfund/programs/riskassess/ecolbul.html
[4] - G.P. Friday, 1998. Ecological Screening Values for Surface Water, Sediment, and Soil. Wesinghouse Savannah River Company. Report WSRC-TR-98-00110

TABLE D.6

VAPOR INTRUSION SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Parameter	*Vapor Intrusion Screening Levels*	
	Groundwater Criteria Protective of Residential IA	*Groundwater Criteria Protective of Industrial IA*
	µg/L	*µg/L*
Volatile Organic Compounds		
1,1,1-Trichloroethane	739.49	3128.60
1,1,2,2-Tetrachloroethane	2.80	14.00
1,1,2-Trichloroethane	0.62	2.61
1,1-Dichloroethane	6.53	33.51
1,1-Dichloroethene	19.68	82.47
1,2,4-Trichlorobenzene	3.62	15.16
1,2-Dibromo-3-chloropropane (DBCP)	0.03	0.33
1,2-Dibromoethane (Ethylene dibromide)	0.15	0.75
1,2-Dichlorobenzene	267.53	1121.08
1,2-Dichloroethane	1.95	9.74
1,2-Dichloropropane	2.08	10.41
1,3-Dichlorobenzene	-	-
1,4-Dichlorobenzene	2.23	11.16
2-Butanone (Methyl ethyl ketone) (MEK)	223,541	945,748
2-Hexanone	813.58	3411.80
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	54946.03	230418.83
Acetone	2,236,355	9,784,052
Benzene	1.37	7.05
Bromodichloromethane	0.76	3.81
Bromoform	-	-
Bromomethane (Methyl bromide)	1.73	7.33
Carbon disulfide	124.00	526.57
Carbon tetrachloride	0.36	1.77
Chlorobenzene	40.90	173.03
Chloroethane	2203.60	9695.86
Chloroform (Trichloromethane)	0.73	3.53
Chloromethane (Methyl chloride)	26.07	108.16
cis-1,2-Dichloroethene	-	-
cis-1,3-Dichloropropene	-	-
Cyclohexane	102.73	423.97
Dibromochloromethane	2.81	14.06
Dichlorodifluoromethane (CFC-12)	0.71	3.14
Ethylbenzene	3.01	15.21
Isopropyl benzene	89.33	382.85
Methyl acetate	-	-
Methyl cyclohexane	-	-
Methyl tert butyl ether (MTBE)	391.69	1958.46
Methylene chloride	474.15	1956.80
Naphthalene	4.00	20.01
Styrene	889.45	3913.60
Tetrachloroethene	5.80	24.87
Toluene	1915.54	8104.22
trans-1,2-Dichloroethene	37.77	155.87
trans-1,3-Dichloropropene	-	-
Trichloroethene	0.52	2.19

TABLE D.6

VAPOR INTRUSION SCREENING LEVELS
OU2 RI/FS WORK PLAN
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Parameter	*Vapor Intrusion Screening Levels*	
	Groundwater Criteria Protective of Residential IA	*Groundwater Criteria Protective of Industrial IA*
	µg/L	*µg/L*
Trichlorofluoromethane (CFC-11)	18.41	78.17
Trifluorotrichloroethane (Freon 113)	144.16	604.52
Vinyl chloride	0.14	2.46
Xylenes (total)	47.22	207.77
Metals		
Aluminum (dissolved)	-	-
Antimony (dissolved)	-	-
Arsenic (dissolved)	-	-
Barium (dissolved)	-	-
Beryllium (dissolved)	-	-
Cadmium (dissolved)	-	-
Calcium (dissolved)	-	-
Chromium (dissolved)	-	-
Cobalt (dissolved)	-	-
Copper (dissolved)	-	-
Iron (dissolved)	-	-
Lead (dissolved)	-	-
Magnesium (dissolved)	-	-
Manganese (dissolved)	-	-
Mercury (dissolved)	0.07	0.28
Nickel (dissolved)	-	-
Potassium (dissolved)	-	-
Selenium (dissolved)	-	-
Silver (dissolved)	-	-
Sodium (dissolved)	-	-
Thallium (dissolved)	-	-
Vanadium (dissolved)	-	-
Zinc (dissolved)	-	-
PCBs		
Aroclor-1016 (PCB-1016)	-	-
Aroclor-1221 (PCB-1221)	0.14	0.70
Aroclor-1232 (PCB-1232)	0.14	0.70
Aroclor-1242 (PCB-1242)	-	-
Aroclor-1248 (PCB-1248)	-	-
Aroclor-1254 (PCB-1254)	-	-
Aroclor-1260 (PCB-1260)	-	-
Petroleum Hydrocarbons		
Total Petroleum Hydrocarbons (C10-C20)	1.37	7.05
Total Petroleum Hydrocarbons (C20-C34)	1.37	7.05

[1]- United States Environmental Protection Agency Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, November 2013, based on Target Cancer Risk of 1E-06, and Total Hazard Quotient of 0.1.

APPENDIX E

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED

TABLE E.1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Chemical Specific	This regulation establishes ambient air quality standards and best available technology for the emissions of carbon monoxide, ozone, and hydrocarbons.	Use of a process emitting one of the listed pollutants.	OAC 3745-21	Applicable	Substantive requirements are applicable for onsite waste treatment operations that may generate regulated hydrocarbon air emissions. This would include vapor intrusion mitigation
Chemical Specific	This regulation governs surface water quality criteria with qualitative rules for specific Ohio water bodies/rivers and water body types. These rules establish minimum water quality requirements for all surface waters of the state.	Conducting a response action that includes a discharge to surface water	OAC 3745-1	Applicable	Applicable for off-site discharges of water to surface water; substantive requirements are applicable for onsite discharges
Chemical Specific	These regulations establish the requirements for storage, handling, and disposal of materials containing PCBs greater than 50ppm that may be generated during remedial actions, included as contingency if PCBs are found in the future.	Generation of PCB remediation waste	40 CFR 761	Applicable	Substantive requirements are applicable if any PCB-containing materials are removed or handled.

TABLE E.1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Location Specific	Requires that wetlands be maintained such that there is no net loss of wetland acreage or functions. If impacts cannot be avoided compensatory mitigation may be required.	Activities within wetlands.	OAC 3745-1-54	Applicable	Remedial actions may disturb onsite wetland areas (large and small ponds). If the disturbance results in a net loss of wetland, a mitigation plan will be prepared and implemented. Only those substantive requirements relevant for the category of wetland will apply.
Location Specific	Requires that impacts to wetlands be mitigated in accordance with set mitigation ratios.	Activities impacting wetlands.	ORC 6111.027	Applicable	Remedial actions may disturb onsite wetland areas (large and small ponds). If the disturbance results in a net loss of wetland, a mitigation plan will be prepared and implemented. Only those substantive requirements relevant for the category of wetland will apply.
Location Specific	Protects almost all species of native birds in the United States from unregulated taking.	Presence of migratory birds.	*Migratory Bird Treaty Act*, 16 USC 703	Applicable	The site is located in the Mississippi Migratory Flyway. If migratory birds, or their nests or eggs, are identified at the site, operations will not destroy the birds, nests, or eggs.
Location Specific	Establishes a covenant for the restriction of activity and use at contaminated properties by maintaining institutional controls	Remedial actions at sites where waste is left in place.	ORC 5301.80-5301.92	Applicable	Applicable to remedial actions that rely on institutional controls using Ohio's Environmental Covenants Act.

TABLE E.1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Requires that best management practices be employed to prevent stormwater pollution caused by erosion and sedimentation as well as any other potential pollutants during construction activities.	Any use of the land, comprising an area that is one acre or more, that results in a change in the natural cover or topography and that may cause or contribute to sedimentation.	NPDES Permit OHC000003 (substantive requirements only)	Applicable	Since this is an onsite CERCLA action, coverage under the permit is not required. The substantive requirements of the permit will be complied with for onsite actions. For hot spot remedies that do not disturb greater than one acre of land these requirements would be relevant and appropriate.
Action Specific	This regulation governs and places limits on the particulate matter emissions from air pollution sources.	Conducting any activity which may cause particulate matter to become airborne.	OAC 3745-17	Applicable	During all land disturbing activities reasonable precautions will be taken to prevent particulate matter from becoming airborne.
Action Specific	Prohibits filling, grading, excavating, building, drilling, or mining on land where a hazardous waste facility or solid waste facility was operated without prior authorization from the Director.	Filling, grading, excavating, building, drilling, or mining activities at a current or former hazardous waste facility or solid waste facility.	ORC 3734.02(H)	Applicable	Substantive requirements are applicable to remedial actions that include excavations onsite.

TABLE E.1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Construction of groundwater monitoring well(s)	Installation, maintenance, and abandonment of wells (including temporary) other than for water supply	OAC 3745-9	Applicable	Substantive requirements are applicable to any remedial alternative where well installation and maintenance is required.
Action Specific	These regulations specify the requirements for construction, operation, and closure of solid waste disposal facilities. Requires completion of final closure in a manner that minimizes the need for further maintenance and minimizes post-closure formation and release of leachate and explosive gases to air, soil, ground water, or surface water to the extent necessary to protect human health and the environment.	Closure and post-closure activities of a landfill	OAC 3745-27	Applicable	Substantive requirements are applicable when a landfill is closed with waste left in place. Topics include but are not limited to cap design, groundwater monitoring, explosive gas monitoring, explosive gas management, surface water management and design of control structures, pest control, deed notifications, signage, access restrictions, post-closure care, and accumulation of solid waste onsite in containers.
Action Specific	These regulations set forth general requirements for the RCRA hazardous waste management system	Generation and management of hazardous waste	OAC 3745-50	Applicable	Substantive requirements are applicable onsite if hazardous waste is generated.

TABLE E.1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED
SOUTH DAYTON DUMP AND LANDFILL
MORAINE, OHIO

Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Set for definitions and procedures related to the identification and listing of hazardous waste.	Management of hazardous waste	OAC 3745-51	Applicable	Substantive requirements are applicable onsite if hazardous waste is generated.
Action Specific	These regulations set forth RCRA generator requirements of manifests, pre-transport labeling, marking, placarding, recordkeeping, and reporting	Generation of hazardous waste	OAC 3745-52	Applicable	Substantive requirements are applicable onsite if hazardous waste is generated through removal of any hazardous wastes or hazardous constituents and will be disposed of offsite.
Action Specific	Set forth RCRA transporter standards for compliance with manifest and record keeping, and cleanup of discharge. Pertains to sites where hazardous waste will be transported off site for treatment, storage, or disposal.	Offsite transportation of hazardous waste	OAC 3745-53	Applicable	Substantive requirements are applicable if hazardous waste is transported on a public roadway that is onsite but outside of and not adjacent to the facility boundary.
Action Specific	Restricts land disposal of RCRA hazardous wastes; outlines treatment standards and prohibitions on storage of restricted wastes.	Disposal of hazardous waste onsite	OAC 3745-270	Applicable	Substantive requirements are applicable if hazardous waste is disposed of onsite.

TABLE E.1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND GUIDANCE TO BE CONSIDERED
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MORAINE, OHIO

Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Prohibits causing pollution or causing to be placed any sewage, sludge, sludge materials, industrial wastes, or other wastes in a location where they cause pollution of any waters of the state.	Management of sewage, sludge, sludge materials, industrial wastes, or other wastes	ORC 6111.04	Applicable	Substantive requirements are applicable for onsite discharges.
Action Specific	Accumulations of offal, filth, or noisome substances that are a nuisance are prohibited. Obstruction and pollution of any water course is prohibited. Discharges of oil from an oil well, oil tank, oil vat, or place of deposit of crude or refined oil to any surface water body or to any conveyance to a surface water body are prohibited.	Conducting any onsite activity that may result in a nuisance.	ORC 3767.13 (B) and (C); and 3767.14	Applicable	Substantive requirements are applicable for onsite discharges or disposal.
Action Specific	Sets forth requirements for management of solid and hazardous waste.	Generation and management of waste and waste disposal facilities	ORC 3734	Applicable	Substantive requirements are applicable for onsite activities.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	These regulations set forth standards for the construction of landfills, Incinerators, CAMUs, drip pads, and Miscellaneous Units	Management of hazardous waste in onsite units.	OAC 3745-57	Applicable	Substantive requirements are applicable only if hazardous wastes are generated and managed (stored or treated) onsite. Hazardous waste unit closure requirements are not applicable for any remedial action at this site.
		Closure and post-closure care of a hazardous waste landfill		Relevant and appropriate	Substantive requirements are relevant and appropriate to the closure and post-closure care for these remedial alternatives specified because the landfill was never subject to hazardous waste permitting.
Action Specific	This document contains USEPA guidance for construction of hazardous waste caps	Construction of a hazardous waste landfill cap	EPA 530-SW-89-047	TBC	The cap will be constructed in accordance with these requirements if a hazardous waste cap is needed. USEPA Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, USEPA, Office of Research and Development, July 1989.
Action Specific	If storage capacity limits are exceeded a Spill, Prevention, Control, and Countermeasures Plan must be prepared and implemented with procedures, methods, equipment, and other requirements to prevent the discharge of into or upon the navigable waters of the United States.	Total onsite storage capacity exceeding 1,320 gallons in containers that are 55 gallons or larger in size.	40 CFR 112	Applicable	It is anticipated that fuels may be stored onsite during construction If the storage capacity in containers that are 55 gallons or greater is equal to or exceeds 1,320 gallons a Spill Prevention, Control, and Countermeasure (SPCC) Plan must be prepared and implemented. Containers include oil and fuel reservoirs in equipment.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Requires a 2.5h:1v minimum slope, with a preferred 3h:1v slope or flatter.	Constructing an embankment at the South Dayton Dump site.	Miami Conservancy District Requirements	TBC	The embankment will be constructed in accordance with these requirements.
Action Specific	Requires the use of clean compactable material with topsoil to support vegetation.	Constructing an embankment at the South Dayton Dump site.	Miami Conservancy District Requirements	TBC	The embankment will be constructed in accordance with these requirements.
Action Specific	Requires no trees or woody vegetation, and no flowering plants or shrubs with bare soil that could allow concentrated erosion areas or provide shelter for burrowing animals. Turf-grass type mixture preferred.	Constructing an embankment at the South Dayton Dump site.	Miami Conservancy District Requirements	TBC	The embankment will be constructed in accordance with these requirements.
Action Specific	Recommends placing fence at top of slope on adjacent property. If on MCD, stipulates that the owner would need a permit from MCD providing for installation, maintenance, repair, and replacement.	Constructing an embankment at the South Dayton Dump site.	Miami Conservancy District Requirements	TBC	Fencing will be constructed in accordance with these requirements.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Prohibits construction of permanent or temporary structures within the floodway.	Construction within 500 feet of the river channel.	MCD Land Use Policy Item 204.04.01	Applicable	If structures are constructed within the flood way then they will conform to these standards.
Action Specific	Restricts or prohibits uses which result in damaging increases in flood heights or velocities.	Any construction or development activity in a special flood hazard area, or within 500 feet of the river channel.	Montgomery County Stormwater Flood Damage Prevention Regulations (substantive requirements only); MCD Land Use Policy Items 204.04.02 and 206.04.03	Applicable	Portions of the site are located in a FEMA-designated special flood hazard area. Since this is an onsite CERCLA action, a floodplain development permit and post-construction certification are not required. The substantive requirements of the regulations will be complied with for onsite actions.
Action Specific	Specifies performing a HEC- RAS water surface profile analysis along Great Miami River modeling existing and proposed conditions with MCD discharge = 120,000 cfs to ensure that proposed design would not increase flood profile upstream in Dayton flood protection channel and levees.	Designing a cap for the South Dayton Dump site.	Requirements established for the South Dayton Dump site by the Miami Conservancy District as authorized by ORC 6101.19	Applicable	The HEC-RAS model will be run in accordance with these requirements.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Prohibits levee excavations requiring open cutting, jacking, and boring but permits boring beneath the levee or river channel subject to MCD approval. Stipulates that the levee may not remain open for more than five days or over the weekend.	Performing excavating or boring activities on the levee or under the river channel.	MCD Land Use Policy Items 204.03.01, 204.03.02	Applicable	Any activities taking place on the levee will be performed in accordance with these requirements.
Action Specific	Requires compaction of material at 95% proctor following restoration of a levee.	Performing construction activities that disturb the levee.	MCD Land Use Policy Item 209.06.01	Applicable	The levee material will be restored to this compaction level following any activity requiring restoration of the levee.
Action Specific	Requires seeding or sodding of all levee slopes within seven days of construction causing a disturbance to the levee and maintenance and monitoring of the regrowth until it is established.	Performing construction activities that disturb the levee.	MCD Land Use Policy Item 209.06.02	Applicable	The levee vegetation will be restored in accordance with this requirement following any activity requiring restoration of the levee.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Requires covering the asbestos-containing waste material and posting warning signs to deter access by the public, or using an alternative control method.	Evidence of asbestos disposal at the site.	OAC 3745-20-07	Applicable	Substantive requirements apply to onsite activities that are subject to regulation.
Action Specific	Prohibits emission of an air contaminant in violation of Sec. 3704 or any rules, permit, order, or variance issued pursuant to that section of the Ohio Revised Code.	Conducting any activity that results in emission of an air contaminant in violation of Sec. 3704 or any rules, permit, order, or variance issued pursuant to that section of the ORC.	ORC 3704.05(B)	Applicable	Substantive requirements apply to onsite activities that are subject to regulation.
Action Specific	Prohibits emission of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, or any other substances or combination of substances, in such manner or in such amounts as to endanger the health, safety, or welfare of the public, or cause unreasonable injury or damage to property.	Conducting any activity that results in an emission of any of the listed contaminants in such a manner as to endanger health, safety, welfare, or property.	OAC 3745-15	Applicable	Substantive requirements would apply to onsite activities that are regulated. None of the listed contaminants will be emitted in a manner or amount that will endanger health, safety, welfare, or property while carrying out any of the response actions.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Prohibits hazardous waste facilities from emitting any particulate matter, dust, fumes, gas, mist, smoke, vapor, or odorous substance that interferes with the comfortable enjoyment of life or property or is injurious to public health.	Conducting any activity at a hazardous waste facility that results in emission of particulate matter, dust, fumes, gas, mist, smoke, vapor, or odorous substance that interferes with the comfortable enjoyment of life or property or is injurious to public health.	ORC 3734.02(I)	Applicable	Substantive requirements apply to onsite activities that are subject to regulation.
Action Specific	Requires the use of Good Engineering Practice stack heights. Specifies emission limits and monitoring and inspection requirements for process vents regulated under RCRA Includes requirements for closure and post-closure care of permitted hazardous waste disposal facilities.	Emitting air contaminants through a stack.	OAC 3745-16-02	Applicable	Substantive requirements apply to onsite activities that are subject to regulation.
		Closure or post closure of a permitted hazardous waste unit	OAC 3745-55	Relevant and appropriate	Substantive requirements are relevant and appropriate to the closure and post-closure care for these remedial alternatives specified because the landfill was never subject to hazardous waste permitting.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Sets standards for operation of and emissions from process vents	Operation of a facility with process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations managing hazardous wastes with organic concentrations of at least 10 parts per million weight (ppmw) shall reduce total organic emissions from all affected process vents	40 CFR 264.1032	Applicable	Substantive requirements apply to on-Site operation of process vents.
Action Specific	Sets standards for operation of closed-vent systems and control devices	Operation of closed-vent systems and control devices	40 CFR 264.1033	Applicable	Substantive requirements apply to on-Site operation of closed-vent systems and control devices. On-Site operation of closed-vent systems and control devices will conform to the design specifications and requirements of the regulation.

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Category	*Requirement*	*Prerequisite*	*Citation*	*Preliminary Expected ARAR Determination*	*Comment*
Action Specific	Sets requirements for emissions from highway vehicles and engines by model year.	Use of vehicles on site.	40 CFR 86	Applicable	Vehicles used on-site will conform to the EPA requirements for their model year.
Action Specific	Establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the NPDES permit process.	Discharges to the storm sewer system.	Codified Ordinances of Moraine--Title Nine Stormwater Plan, Chapter 945 Storm Sewer System Illicit Discharge Detection and Elimination and OAC 3745- 39-04	Applicable	Discharges to the storm sewer are an off-site activity, however onsite actions will be conducted in a manner that will not create run off that would eventually discharge to this system causing a violation of these requirements. Applicable because these ordinances are promulgated to maintain compliance with Ohio's NPDES program.
Action Specific	Provides standards for the operation and maintenance of private water systems.	Operation of a private water system consisting of less than 15 service connections.	ORC 3701.334 - 347 and OAC 3701-28	Applicable	Institutional controls will be included in the remedial design to prevent the onsite consumption of contaminated water from the Valley Asphalt well. The water from this well is not intended for public consumption, however if it is determined that institutional controls are not sufficient to protect against accidental ingestion then the well will become subject to the substantive provisions included in this statute and regulations.