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May 10, 2013 Reference No. 038443-73

Ms. Leslie Patterson
Remedial Project Manager
United States Environmental Protection Agency
Region V
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, Illinois
60604

Dear Ms. Patterson:

Re: Final Work Plan for Operable Unit One (OU1) Groundwater and Data Gap Investigation – Phase 1A (Work Plan)
South Dayton Dump and Landfill Site Moraine, Ohio (Site)

This Work Plan presents the proposed approach for the OU1 Phase 1A Groundwater and Data Gap Investigation at the Site. Conestoga-Rovers & Associates (CRA) has prepared this 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).

The activities proposed in the Work Plan constitute a portion of the Remedial Investigation of OU1 at the Site. The objectives of the RI are detailed in Paragraph 9 (a) of the ASAOC as follows:

> *to determine the nature and extent of contamination and any current or potential threat to the public health, welfare, or the environment posed by the release or threatened release of hazardous substances, pollutants or contaminants at or from the Site and to collect sufficient data for developing and evaluating effective remedial alternatives*

The purpose of the OU1 Groundwater and Data Gap Investigation is to complete an investigation of groundwater quality within and surrounding OU1 and to investigate data gaps

identified during the completion of previous RI activities at the Site. The work is intended to provide additional data with respect to sources, nature, and extent of contamination that will ultimately be used to determine the most appropriate groundwater containment or mitigation options for OU1. CRA will complete the work proposed in this Work Plan in accordance with the USEPA-approved Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), and Site-Specific Health and Safety Plan (HASP), and associated addenda CRA previously submitted to USEPA.

This Letter Work Plan is based on the Data Quality Objectives (DQO) table and Data Gap rationale table, which USEPA previously reviewed, and which are provided in Attachments A and B, respectively. There are seven steps in the DQO process. A discussion of the DQO steps for the OU1 Phase 1A Groundwater and Data Gap Investigation is presented in Attachment A. The Respondents have prepared this Work Plan based on discussions between the Respondents, USEPA, Ohio EPA, and CH2M Hill in March and April 2013. This Work Plan incorporates comments received from USEPA on March 12, 2013, and April 10, 2013.

DQO WORK OBJECTIVES

Insufficient information exists to develop and evaluate remedial alternatives that address migration of contaminated groundwater and landfill gas beneath the Site. In order to develop information sufficient for a remedy evaluation and decision, additional information regarding the sources of contamination, and the potential for contaminated groundwater and landfill gas to migrate off Site is required. The Respondents propose to complete a series of phased groundwater investigations, which collectively constitute the OU1 Groundwater and Data Gap Investigation to assist in the development of remedial alternatives to control or mitigate groundwater contamination originating from the Site that is, or has the potential to, migrate off Site, and to further investigate the groundwater contamination identified to date.

The Respondents and USEPA have agreed that a multi-phase approach is appropriate for the OU1 Groundwater and Data Gap Investigation. The general objectives for the phases of work that comprise the OU1 Groundwater and Data Gap Investigations include the following:

Groundwater Investigation:

- Collect data to assist in characterizing groundwater impact and select locations for monitoring wells through shallow groundwater Geoprobe investigations and VAS
- Define subsurface stratigraphy, including identifying till-rich zone(s) and sand and gravel aquifer zone(s) at additional locations beneath the Site to a maximum depth of 200 feet (ft) below ground surface (bgs) using Rotosonic drilling

- Install permanent monitoring wells at locations and depth intervals where impacts are identified during the Phased DQO Investigation, and at locations where data gaps exist
- Characterize groundwater chemistry at Site monitoring wells and VAS borings through groundwater sampling and laboratory analysis
- Determine if contaminated groundwater is migrating off-Site

The work detailed above will be completed in the following separate phases:

Phase 1A consists of the advancement of soil boreholes, and installation of temporary Geoprobe monitoring wells, and collection of low-flow groundwater samples from the top of the water table to:

- Investigate the nature of groundwater contamination in on-Site areas of concern and delineate the lateral extent of contamination for the purpose of control or mitigation
- Identify the direction of contaminant migration from areas of concern
- Complete further investigation in data gap areas

Phase 1B consists of installation of permanent monitoring wells in select locations based on the Phase 1A analytical results, and collection of groundwater samples to characterize groundwater chemistry and monitor groundwater contamination

Phase 2A consists of VAS investigation to: 1) delineate the vertical extent of known areas of groundwater contamination identified during the Phase 1A and Phase 1B investigations, 2) determine the intervals of greatest contaminant concentrations, and 3) determine where contaminated groundwater is migrating from the landfill.

Phase 2B consists of installation of permanent monitoring wells in select locations based on the analytical results from previous phases, and collection of groundwater samples to characterize groundwater chemistry and monitor groundwater contamination.

Phase 1A, which is the focus of this Work Plan, will include the following tasks:

- Investigate the nature of groundwater contamination in on-Site areas of concern and delineate the lateral extent of contamination for the purpose of control or mitigation
- Identify the direction of contaminant migration from areas of concern

- Delineate the extent of residual non-aqueous phase liquid (NAPL) in the areas of vertical aquifer sampling (VAS) location VAS-04 and soil gas probe GP19-09
- Collect data to assist in selection of monitoring well locations for Phase 1B
- Investigate five total field magnetic anomalies identified during a Geophysical Survey of the Site
- Investigate a geophysical electromagnetic (EM) anomaly identified in the area of test trench TT-21
- Investigate the lateral and vertical extent of chlorobenzene soil contamination near test pit TP-3
- Determine if the Large and Small Ponds are classified as category wetlands

The work tasks identified above that are associated with Phase 1A are discussed below in the following titled sections:

1.0 OU1 Groundwater Areas of Concern / Data Gaps Background
2.0 OU1 Groundwater Investigation Scope of Work
3.0 OU1 Data Gaps Test Trench Investigation
4.0 Wetlands Delineation and Assessment
5.0 Schedule
6.0 Reporting

1.0 BACKGROUND - OU1 GROUNDWATER AREAS OF CONCERN/DATA GAPS

1.1 TT-21/MW-229 TCE

TT-21 and MW-229 are located on Parcel 5054 (see Area 1 on Figure 1), in the vicinity of the approximate location of the Valley Asphalt drum removal in 2000.

The concentration of trichloroethylene (TCE) detected in groundwater samples collected from MW-229 (70 micrograms per liter [µg/L]) was greater than the USEPA Maximum Contaminant Level (MCL) for TCE (5 µg/L). MW-229 was screened from 22 to 32 ft bgs, at 705.3 to 715.3 ft AMSL.

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VOC concentrations in soil samples collected from TT-21 (21 ft bgs) were less than USEPA Industrial Soil Regional Screening Levels (RSLs), but greater than non-conservative USEPA soil screening levels (SSLs)[1] for groundwater protection, as follows:

Parameter	*Industrial Soil RSLs (mg/kg)*	*Soil Screening Level (SSL) for Groundwater Protection[1] (mg/kg)*	*Concentration (mg/kg)*
Benzene	5.4	0.026	0.36 J
cis-1,2-DCE	2,000	0.21[2]	1.4
Ethylbenzene	27	7.8	18
TCE	6.4	0.018	0.79 J
Vinyl chloride (VC)	1.7	0.0069	0.49

Notes:

[1] Conservative USEPA risk-based SSLs based on a cancer risk of 10^{-4} and a dilution attenuation factor (DAF) of 10; conservative MCL-based SSLs based on a DAF=10, as specified in USEPA July 7, 2010 comments on the Feasibility Study (FS) prepared by CRA. The least of the conservative risk-based and MCL-based SSL values is presented in this table.

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1 These values are based on USEPA screening levels in soil (SSLs) that are protective of groundwater. USEPA Soil Screening Guidance (SSG) User's Guide (USEPA, July 1996) states:

> *SSLs developed in accordance with this guidance are based on future residential land use assumptions and related exposure scenarios.*
>
> *SSLs are not national cleanup standards. [emphasis from USEPA] SSLs alone do not trigger the need for response actions or define "unacceptable" levels of contaminants in soil.*
>
> *Generally, where contaminant concentrations equal or exceed SSLs, further study or investigation, but not necessarily cleanup, is warranted.*
>
> *SSLs are concentrations of contaminants in soil that are designed to be protective of exposures in a residential setting.*

The use of the SSLs at the Site is conservative and only indicates that there is a potential for contaminants in soil to leach to groundwater. With some exceptions, the entire Site is zoned 'M-2 General Industrial'; therefore, application of SSLs that were designed to be protective of residential exposures is also conservative. CRA understands that USEPA has adjusted these values by using a cancer risk of 1×10^{-4} and a DAF of 10. CRA notes that a DAF of 20 is used in the SSLs and that the SSLs are based on the assumption that the source extends to the water table, i.e., there is no attenuation in the unsaturated zone.

[2] Conservative USEPA SSL for groundwater protection equal to a hazard index of 1, using a DAF=10.

J The parameter was positively identified; however, the associated parameter concentration is estimated.

A sample collected from material in a drum excavated at TT-21 (7 ft bgs) also contained concentrations of benzene (12 milligrams per kilogram [mg/kg]), polychlorinated biphenyl (PCB) Aroclor-1254 (21 mg/kg), lead (2,720 mg/kg), and naphthalene (19 mg/kg), which were greater than the USEPA Industrial Soil RSLs, and non-conservative USEPA SSLs for groundwater protection for benzene (0.21 mg/kg), PCB Aroclor-1254 (8.8 mg/kg), lead (14 mg/kg) and naphthalene (0.47 mg/kg). The Respondents excavated and disposed of the drum and its contents off Site as hazardous waste. The concentrations of naphthalene and PCB Arochlor-1254 in the soil samples collected immediately beneath the drum at 8 ft bgs and the deeper sample collected at 21 ft bgs from TT-21 were less than the Industrial Soil RSLs and SSLs.

1.2 GP18-09/TT-22 VOCS

GP18-09 and TT-22 are located on Parcel 5054 (see Area 2 on Figure 1), in the vicinity of the former location of the Dayton Recycling underground storage tanks (USTs).

With the exception of ethylbenzene, VOC concentrations in soil samples collected from TT-22 were less than USEPA Industrial Soil RSLs, but greater than SSLs for groundwater protection, as follows:

Parameter	*Industrial Soil RSLs (mg/kg)*	*Soil Screening Level (SSL) for Groundwater Protection[1] (mg/kg)*	*Concentration (mg/kg)*	
			TT-22 (6 ft bgs)	*TT-22 (21 ft bgs)*
Benzene	5.4	0.026	0.53 J	0.29 J
Ethylbenzene	27	7.8	54	1.5
VC	1.7	0.0069	ND (1.8)	0.061 J

Notes:

[1] Conservative USEPA risk-based SSLs based on a cancer risk of 10^{-4} and a DAF=10; conservative MCL-based SSL based on a DAF=10, as specified in USEPA July 7, 2010 comments on CRA's FS. The least of the conservative risk-based and MCL-based SSLs is presented in this table.

J The parameter was positively identified; however, the associated parameter concentration is estimated.

ND (RDL) Non-detect at the Reporting Detection Limit.

The sample from soil gas probe GP18-09 (located 70 ft north of TT-22) contained the greatest concentration of benzene in soil gas at 14,000 μg/m^3, and also contained naphthalene (980 μg/m^3) and VC (4,800 μg/m^3), which correspond to excess cancer risks greater than 1×10^{-3}. Explosive gas (measured as an equivalent concentration of methane) was detected consistently at concentrations greater than the upper explosive limit (UEL) for methane (15 percent methane) at GP18-09 (20.6 to 26.6 percent methane).

1.3 GP19-09/VAS-04 NAPL PLUME

CRA first encountered evidence of NAPL on November 6, 2008 during installation of VAS-04, on the northeast corner of the B&G Equipment property on Parcel 5171. CRA oversight staff recorded a photo-ionization detector (PID) reading of 235 parts per million (ppm) when screening the soil core from the sample depth corresponding to 24 to 25 ft bgs. The corresponding headspace VOC reading was 600 ppm. CRA field technicians completed a Sudan IV dye test on the soil and observed a red color indicative of the presence of NAPL. CRA encountered water-saturated soil at 27 ft bgs and screened a temporary well from 25 to 30 ft bgs. CRA noted a sheen and strong odor in development water being purged from the well.

In June 2009, CRA advanced eight additional soil borings to assist in characterizing the horizontal and vertical extent of NAPL identified during the drilling of VAS-04. The locations of the NAPL boreholes and VAS-04 are presented on Figure 1 (see Area 3). During borehole advancement, CRA field technicians screened the soil as per the FSP, and completed a Sudan IV dye test for the presence of NAPL at four-foot intervals. CRA advanced the soil borings to a depth of 2 feet below the water table, or until refusal, to prevent the drawdown of NAPL. CRA identified NAPL in six of eight additional soil borings (boreholes BH01-09, BH02-09, BH04-09, BH05-09, BH07-09, and BH08-09), at a maximum depth of 32 ft bgs. Based on the PID readings, positive and trace readings from the Sudan IV dye tests, and recorded observations of the soil cuttings from the boreholes, CRA concluded that BH04-09 and BH08-09 may have contained light NAPL (LNAPL) but the evidence of its presence was less than in the samples collected from BH02-09 and BH07-09, indicating that CRA advanced BH04-09 and BH08-09 near the boundaries of the LNAPL impact.

CRA installed monitoring well MW-219 in the center of the LNAPL impacts, with the well screen set from 22 to 32 ft bgs. CRA has not observed free-phase LNAPL in MW-219.

The NAPL appears to be present as residual NAPL bound to soil and is not present as a separate phase liquid on the surface of the groundwater.

1.4 GP20-09/TT-23 VOCS

GP20-09 and TT-23 (see Area 4 on Figure 1) are located on Parcel 5171, in the vicinity of the former location of the Custom Deliveries USTs.

Chlorinated solvents were detected in the sample from GP20-09. TCE was detected at concentrations between 16,000 and 56,000 μg/m^3, which correspond to an excess cancer risk range of 2×10^{-4} to 9×10^{-4}. CRA derived the soil gas criteria excess cancer risks by modifying the USEPA Industrial inhalation RSL carcinogenic target risks to 10^{-4} and applying an attenuation factor of 10 (for shallow soil gas), or 100 (for deep soil gas), using the same methods detailed in Appendix F of the OSWER Vapor Intrusion Guidance (2002). cis-1,2-DCE was detected at a concentration of range of 4,500 to 16,000 μg/m^3; there is no USEPA industrial air RSL for cis-1,2-DCE.

TCE was detected in a soil sample collected from TT-23 (7 ft bgs) at a concentration (0.031 mg/kg), which is greater than the SSL for groundwater protection for TCE (0.00072 mg/kg), but less than the USEPA Industrial Soil RSL (14 mg/kg). Lead was also detected in the soil sample collected from TT-23 (7 ft bgs) at a concentration (17,700 mg/kg), which was greater than the USEPA Industrial Soil RSL (800 mg/kg) and the SSL (14 mg/kg).

1.5 GP15-09/VAS-08/TT-9 VOCS

GP15-09, VAS-08, and TT-9 are located on Parcel 5172 (see Area 5 on Figure 1).

The soil vapor sample from GP15-09 contained concentrations of cis-1,2-DCE (4,300 μg/m^3), which correspond to a non-cancer hazard index of 122, and TCE (790 μg/m^3) and VC (14,000 μg/m^3), which correspond to excess cancer risks of 3.6×10^{-3}, and 5×10^{-3}, respectively.

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VOC concentrations in groundwater samples collected from VAS-08 were greater than USEPA MCLs, as follows:

Parameter	*USEPA MCL (µg/L)*	*Maximum Concentration (µg/L)*
cis-1,2-DCE	70	87 J
TCE	5	51
VC	2	35

Note:

J The parameter was positively identified; however, the associated parameter concentration is estimated.

Ethylbenzene concentrations in a soil sample collected from TT-9 (22 ft bgs) was greater than USEPA Industrial Soil RSLs. Concentrations of benzene, cis-1,2-DCE, ethylbenzene, TCE, and VC in soil samples collected from TT-9 (7, 17, and 22 ft bgs) were greater than SSLs for groundwater protection, as follows:

Parameter	*Industrial Soil RSLs (mg/kg)*	*SSL for Groundwater Protection[1] (mg/kg)*	*Concentration Range (mg/kg)*		
			TT-9 (7 ft bgs)	*TT-9 (17 ft bgs)*	*TT-9 (22 ft bgs)*
Benzene	5.4	0.026	0.15 J	0.13 J	ND (2.6)
cis-1,2-DCE	2,000	0.21[2]	0.89	0.59 J	0.33 J
Ethylbenzene	27	7.8	15	7	66
TCE	6.4	0.018	0.35 J	0.67 J	0.42 J
VC	1.7	0.0069	0.22 J	0.18 J	ND (2.6)

Notes:

[1] Conservative USEPA risk-based SSLs based on a cancer risk of 10^{-4} and a dilution DAF of 10; conservative MCL-based SSLs based on a DAF of 10, as specified in USEPA July 7, 2010 comments on the FS. The least of the conservative Risk-based and MCL-based SSL values is presented in this table.

[2] Conservative USEPA SSL for groundwater protection equal to a hazard index of 1, using a DAF=10.

J The parameter was positively identified; however, the associated parameter concentration is estimated.

Based on information presented in the Boesch depositions (February 28 and March 1, 2006), transformers containing were stored in a warehouse building on Parcel 5172, which is occupied by Bullseye Amusements. Mr. Boesch recalled Alcine Grillot working on transformers at the back of that building (page 105 of the December 1, 2011 deposition), and would "walk right outside that building and dump it on the ground" (page 109). CRA will collect groundwater samples from this area for PCB analyses.

1.6 GP13-09/VAS-09

GP13-09 and VAS-09 are located on Parcels 5174 and 5173, respectively (See Area 6 on Figure 1).

The groundwater samples collected from VAS-09 (27-32 ft bgs) contained concentrations of chlorinated solvents that were greater than USEPA MCLs as follows.

Parameter	*USEPA MCL (µg/L)*	*Maximum Concentration (µg/L)*
cis-1,2-DCE	70	3,900 J
TCE	5	5,100
VC	2	760

Note:

J The parameter was positively identified; however, the associated parameter concentration is estimated.

CRA installed MW-215A and MW-215B 6.4 and 6.35 ft east and southeast of VAS-09, respectively. Groundwater samples from MW-215A/B did not contain concentrations of cis-1,2-DCE or TCE greater than USEPA MCLs. Groundwater samples from MW-215B contained concentrations of VC (5.9 µg/L, and 6.2 µg/L), which were greater than the USEPA MCL (2 µg/L), but an order of magnitude less than the VC concentration in the groundwater sample collected from VAS-09.

The soil gas sample collected from GP13-09 contained VC at a concentration of 6,800 $\mu g/m^3$, which corresponds to an excess cancer risk greater than 1×10^{-3}.

Edward Grillot 2012 deposition statements and Exhibit 2 indicate that contents of drums may have been dumped southwest of the TT-10 area.

1.7 SHALLOW GROUNDWATER INVESTIGATION ALONG SITE BOUNDARY

Under the December 10, 2010 Dispute Resolution Agreement, the Respondents agreed to investigate the shallow groundwater along the Site boundary between VAS-09 and VAS-22 and in the vicinity of monitoring well MW-210. The results of this investigation will be used to identify potential risks to off-Site receptors from VOCs and naphthalene migrating off Site in groundwater and into buildings via the vapor intrusion pathway.

The Dispute Resolution Agreement requires the Respondents to:

> *submit a work plan (Shallow Groundwater Work Plan) including FSP and QAPP Addenda, for additional characterization of the top five feet of shallow groundwater in the vicinity of Monitoring Well 210 (MW-210) at the locations in the Respondents' draft MW-210 Shallow Groundwater Investigation Letter Work Plan, dated March 16, 2010, and at locations no greater than 100 feet apart at the Site boundary starting: 1. adjacent to Dryden Road east of VAS-09; 2. continuing south to the Site boundary at the intersection of Dryden Road and East River Road; 3. continuing west along the south side of the access road to Lot 4610, with a sampling point at the northeast corner of Lot 4610; 4. continuing south along the east boundary of Lot 4610 to Lot 3254 (skipping the Site boundary around Lot 3252); and 5. continuing southwest along the East River Road boundary of the Site to a location east of VAS-22 (Shallow Groundwater Investigation Letter Work Plan). See highlighted area on [Figures 2 and 3], attached, for an illustration of the sampling area. The data quality objectives for the groundwater samples will include, but are not limited to, detecting VOCs and naphthalene in shallow groundwater at the Site boundary that pose more than a 1×10^{-6} cancer risk or a hazard index greater than 1.0 through the vapor intrusion pathway to current or potential future receptors. The samples may be collected using direct push technology, and will be collected using low-flow sampling and groundwater stabilization procedures consistent with those developed for the vertical aquifer sampling previously conducted during RI/FS Work at the Site provided the low-flow sampling and groundwater stabilization procedures meet the data quality objectives required for the VI Study. The sampling intake will be set approximately 2.5 feet below the water table. This Shallow Groundwater Work Plan for additional characterization of groundwater shall be submitted by December 17, 2010.*

The USEPA and the Respondents agreed to revise the Dispute Resolution Agreement groundwater DQO action levels that pose greater than a 1×10^{-6} cancer risk or a hazard index greater than 1.0 through the vapor intrusion pathway. As specified in the DQO table (Attachment A), the groundwater action levels (Action Levels) for the source area investigations include: USEPA MCLs; USEPA Tapwater criteria; concentrations calculated for USEPA RSLs for

gas inhalation according to the method in USEPA-approved guidance; and/or cumulative risks and hazards.

1.8 MW-210 – TCE IN GROUNDWATER

The greatest TCE concentrations in groundwater samples collected from any permanent on-Site monitoring well have been consistently detected in the samples collected from MW-210 (see Figure 2). MW-210 is screened between 26 and 36 ft bgs and the well screen is 5 ft below the water table. The TCE concentrations in groundwater samples collected from MW-210 between 1999 and 2009 ranged from 30 to 260 µg/L, greater than the USEPA MCL of 5 µg/L. TCE was also detected at a concentration of 70 µg/L in a groundwater sample collected from MW-229 (see Area 1 on Figure 1) at a well screen depth of 22 to 32 ft bgs. CRA has defined the vertical extent of TCE impacts to 200 ft bgs in groundwater near MW-210 through the analyses of groundwater samples collected from VAS-21 and monitoring wells MW-210, MW-210A, and MW-210B[2].

1.9 TP-3 CHLOROBENZENE

TP-3 is located on Parcel 5177 (see Figure 3). Chlorobenzene was detected in a soil sample collected from TP-3 (16 ft bgs) at a concentration of 560 mg/kg, which is greater than the soil screening value for groundwater protection, and corresponds to a hazard index of 900 based on a DAF of 10. The sample was collected at an approximate elevation of 707.6 ft above mean sea level (AMSL), which was 7.5 ft below the highest recorded water table, as measured on March 7, 2011.

2.0 PHASE 1A - OU1 GROUNDWATER INVESTIGATION SCOPE OF WORK

In order to determine the concentration of shallow groundwater contaminants (i.e., within five feet of the water table) in areas identified as potential source areas on Site and at the Site boundary where contaminants, if present in the shallow groundwater, could result in direct contact or vapor intrusion risks to off-Site receptors, CRA will advance boreholes at horizontal distances no greater than 100 ft as shown on Figures 1 and 2. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance a subset of boreholes (i.e., 1 in 4) deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 60 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily

2. CRA has not fully delineated the vertical extent of the deeper vinyl chloride contamination below 200 ft bgs.

identify groundwater source areas, and secondarily obtain additional information regarding Upper Aquifer stratigraphy.

CRA will collect a groundwater sample from the top 5 ft of shallow groundwater at each borehole. CRA will collect a minimum of one soil sample from the deepest, unsaturated soil interval of the borehole. Should field screening indicate the possibility of soil contamination (i.e., visual observations of staining, strong odor, greater than 50 ppm of undifferentiated VOCs based on PID readings) in one or more intervals, CRA will collect one soil sample from each discrete area in addition to the sample from the deepest, unsaturated soil interval.

All borings will be completed using the Geoprobe™ direct push drilling technique. Details regarding Geoprobe™ drilling are provided in Appendix J-F-38 of the FSP.

During borehole advancement, continuous soil cores will be retrieved to log soil stratigraphy. CRA will screen the cores with a PID for the presence of VOCs, and also screen for the presence of methane, either by using a landfill gas meter (such as a Landtec GEM-2000, MultiRAE 4-Gas monitor, or equivalent) or a flame-ionization detector (FID) calibrated for methane.

Where evidence of contamination is identified in a portion of the soil core at a given location, based on the field screening (i.e., elevated PID readings and visual, and/or olfactory observations including sheen), soils will be tested for the presence of NAPL using a Sudan IV® dye test and/or another USEPA-approved shaker test, as appropriate in accordance with the Field Screening of NAPL Standard Operating Procedure (SOP), Appendix J-F-28 of the FSP. CRA will assess the soil samples collected from boreholes installed to delineate LNAPL near VAS-4 using the Sudan IV® dye test.

CRA will collect samples from the depths listed in Attachment B and will analyze the samples for the parameters also listed in Attachment B.

CRA will collect groundwater samples from temporary monitoring wells using a Geoprobe SP16 Groundwater Sampler. The SOP for the Geoprobe SP16 Groundwater Sampler is provided in Appendix J-F-38 of the FSP. The Geoprobe SP16 is a direct push groundwater sampling device that consists of a well screen inside a steel sheath that is driven to the desired sample depth using standard Geoprobe rods. The Geoprobe SP16 is then deployed by retracting the steel sheath and exposing the well screen directly to the formation. The maximum well screen length of the Geoprobe SP16 is 41 inches. Groundwater samples will be collected through the stainless steel screen using a mechanical bladder pump set at a flow rate of 100 millilitres per minute (mL/min) (a peristaltic pump may also be used). The SOP for the mechanical bladder pump is included in Appendix J-F-38 of the FSP.

Chapter 10 of the Ohio EPA Technical Guidance Manual for Ground Water Investigation (May 2012) states groundwater samples collected from monitoring wells may contain noticeable amounts of sediment. If large, immobile particles to which metals are bound are allowed to remain in field-acidified samples, laboratory "total" analyses will overestimate the true concentration of mobile species because acidification dissolves precipitates or causes adsorbed metals to desorb.

Unfiltered groundwater samples collected in 2008 and 2009 from all VAS locations contained concentrations of total arsenic and lead that were greater than RSL MCL criteria. CRA proposed to collect filtered groundwater samples in addition to unfiltered groundwater samples (i.e., for both dissolved and total metals analyses). USEPA approved the collection and analyses of the filtered groundwater samples in a conference call on December 3, 2008. CRA collected filtered groundwater samples for dissolved metals (arsenic and lead) analysis from a subset of VAS locations. Concentrations of dissolved (i.e., filtered) metals sampled at all VAS locations were less than the concentrations of total (i.e., unfiltered) metals at all locations, typically by more than an order of magnitude. Concentrations of arsenic and lead in unfiltered samples were less than RSL MCL criteria, with the exception of dissolved arsenic concentrations from two locations. Accordingly, for this Work Plan, CRA proposes collection of unfiltered VOC groundwater samples in order to prevent aeration and loss of volatile analytes. Based on previous Site investigations, CRA proposes collection of filtered groundwater samples for all other parameters (i.e., PCBs, naphthalene, metals, etc.) for this Work Plan.

For Quality Assurance/Quality Control (QA/QC) purposes, CRA will submit one field duplicate for analyses for every 10 soil or groundwater samples analyzed. Based on the total expected number of groundwater samples to be collected during borehole advancement, CRA will submit nine field duplicate groundwater samples, and two field duplicate soil samples. CRA will also submit one trip blank sample per shipment for VOC analyses in accordance with the QAPP.

The OU1 Source Area Groundwater Investigation will also include the collection of a groundwater sample from the water supply well located 500 ft downgradient of MW-210. The well is located at 2447 East River Road. CRA previously provided the sampling protocols for this well to USEPA in an SOP as an attachment to a letter dated January 13, 2012. CRA will collect a groundwater sample from this water supply well via a tap, if present. CRA will confirm with a representative from 2447 East River Road that the water from the tap is not altered by any method including water treatment devices (i.e., water softeners, filtration units, ultraviolet light, reverse osmosis, distillers, chlorinators, etc.), and therefore, is representative of the groundwater in the aquifer in which the water supply well is screened. If water treatment devices are present and a sample cannot be collected from a tap or other location upstream of any such devices, CRA will, if feasible, collect a groundwater sample directly from the water

supply well using a bladder pump. The SOP for the bladder pump is included in Appendix J-F-38 of the FSP. CRA will submit the groundwater sample from the water supply well for TCL VOCs, naphthalene, and metals analyses.

CRA will evaluate the results of the OU1 source area groundwater investigation to remove data gaps; identify areas of concern; determine which specific areas may require active remediation; and to assist with the selection and design of the remedial strategy for OU1 groundwater during the OU1 Remedial Design (RD) or define the extent of contamination as part of the OU2 RI, whichever is completed sooner. CRA will evaluate the OU1 data gaps groundwater results by comparing groundwater sample concentrations to USEPA MCLs, USEPA RSLs for tap water, and/or concentrations calculated from USEPA RSLs for gas inhalation. The data gaps and proposed investigation locations are summarized in Attachment B.

Following completion of Phase 1A of the OU1 source area groundwater investigation, the Respondents will summarize the resultant data into tabular form and databox figures. The Respondents will also prepare figure(s) presenting proposed permanent monitoring well locations and a corresponding rationale table detailing proposed additional investigative locations, permanent monitoring wells and corresponding screened intervals, soil vapor investigation[3], or remediation required in order to further define or mitigate excess risks posed by contaminants in shallow groundwater in the investigated areas. CRA will submit the files to USEPA for review and discussion.

The Respondents will complete additional investigation deemed necessary based on the results of the OU1 Source Area Groundwater Investigation on an expedited basis outside of the OU2 Remedial Investigation process unless otherwise agreed between the Respondents and USEPA. Following USEPA approval of the locations and installation details, CRA will install permanent monitoring wells to confirm source areas, monitor for suspected LNAPL, and monitor downgradient contaminant migration, where appropriate (i.e., near the Site boundary).

Each of the groundwater data gap areas discussed above will be investigated during Phase 1A, as detailed in the subsections below.

[3] The need for a soil vapor investigation will be based on Phase 1A groundwater results, Phases 1B and 2B permanent monitoring well groundwater samples compared to the USEPA Vapor Intrusion Screening Level (VISL) Calculator. The USEPA VISL Calculator provides screening level concentrations for groundwater based upon default residential or non-residential exposure scenarios, a target cancer risk level of one per million (10^{-6}) and a target hazard quotient of one for potential non-cancer effects.

2. 1 AREA 1 - TT-21/MW-229 TCE AND PCBS

The Respondents propose to complete additional investigation to delineate TCE groundwater contamination in the vicinity and upgradient of MW-229, and determine the potential presence and extent of PCB soil and groundwater contamination from TT-21 excavated drum contents. CRA will advance 11 boreholes on Site in the vicinity of MW-229 and TT-21. Area 1 on Figure 1 presents the approximate locations of the proposed boreholes around MW-229 and TT-21. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance a subset of boreholes (i.e., 1 in 4) deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 60 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater contamination source areas, and secondarily obtain additional information the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect an unfiltered groundwater sample from the top 5 ft of shallow groundwater at each borehole for VOC analyses. CRA will collect filtered groundwater samples for metals, PCB, and naphthalene[4] analyses from 1 in every 4 locations (based on a spatial distribution), in order to determine possible metals and naphthalene contamination from the drum excavated at TT-21. Should evidence of potential PCB, metals, or naphthalene contamination be identified in the field, CRA will discuss the need for additional sample collection with the USEPA representative on Site.

The Respondents will collect soil samples for VOC analysis from all Area 1 boreholes, and for PCB analysis from two boreholes completed near TT-21, in accordance with the soil sample collection criteria specified in Section 2.0.

2.2 AREA 2 - GP18-09/TT-22 VOCS

The Respondents propose to complete additional investigation in the vicinity of GP18-09/TT-22 to determine the concentrations of VOCs in shallow groundwater have been contaminated by soil, and to determine if potential groundwater contamination is the source of VOCs in soil vapor detected in samples from GP18-09.

CRA will advance five boreholes on Site in the vicinity of TT-22 and GP18-09. Area 2 on Figure 1 presents the approximate locations of the proposed boreholes around GP18-09 and TT-22. CRA will advance the boreholes to a minimum of 5 ft below the water table

[4] Naphthalene will be analyzed as a VOC parameter, and therefore will be unfiltered.

(i.e., 30 ft bgs). CRA will attempt to advance all five boreholes deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 60 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater source areas, and secondarily obtain additional information regarding the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect an unfiltered groundwater sample from the top 5 ft of shallow groundwater at each borehole for VOC analyses. CRA will also collect a soil sample from each borehole in --Area 2 for VOC analyses, in accordance with the soil sample collection criteria specified in Section 2.0.

2.3 AREA 3 - GP19-09/VAS-04 NAPL PLUME

The Respondents propose to delineate the extent of residual LNAPL in the areas of BH04-09 and BH08-09 by advancing five Geoprobe boreholes in the vicinity of GP19-09/VAS-04, as shown on Figure 1 (Area 3). Additional details regarding Geoprobe drilling are provided in the Appendix J-F-38 of the FSP.

CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). To prevent potential draw-down of LNAPL to deeper depths where it may not be present, CRA will advance the boreholes to a maximum depth of 10 ft below the water table. CRA will collect a groundwater sample from the top 5 ft of shallow groundwater at each borehole. CRA does not propose soil sample collection from the boreholes in the vicinity of GP19-09/VAS-04 (Area 3).

CRA will collect groundwater samples for VOCs (unfiltered), total petroleum hydrocarbon (TPH) (unfiltered), metals (filtered), and naphthalene analyses from the two boreholes located closest to the Site boundaries (i.e., north and east). CRA will collect groundwater samples from the two proposed boreholes, one located to the north of GP19-09/VAS-04 and one located to the east, in order to determine if contaminants in the GP19-09/VAS-04 area are migrating off-Site towards the Great Miami River (GMR) or neighboring properties, respectively.

In locations where LNAPL is identified, CRA will step out approximately 40 ft from those locations and advance additional boreholes. CRA may install additional permanent monitoring wells in Phase 1B of the Groundwater Investigation, based on the results of this Phase 1A investigation.

As discussed between USEPA and the Respondents during the March 6, 2013 conference call, the Respondents will complete bail-down testing at MW-219 and a solubility assessment to determine if residual LNAPL is bound to soil or may be present as a separate phase liquid on the groundwater surface. The solubility assessment will include a comparison of the soil and groundwater results to the soil saturation limit (C_{sat}) values and one percent of the aqueous solubility limit (S) values in the RSL tables in order to provide an indication of which, if any, constituents are the likely contributors to any NAPL formation. The solubility assessment will be used to support the results of the bail down tests.

A bail-down test will draw down the water level in the monitoring well. The purpose of the bail-down test is to determine if NAPL that may be present just at or beneath the water table may flow into the monitoring well. CRA will use a pump for the bail-down test, in order to achieve appreciable drawdown.

2.4 AREA 4 - GP20-09/TT-23 VOCS

The Respondents propose to advance six boreholes in the vicinity of GP20-09 and TT-23 to investigate the possibility that a source of chlorinated solvents may be present in soil or groundwater in the vicinity of GP20-09 and TT-23. Area 4 on Figure 1 presents the approximate locations of the proposed boreholes near GP20-09 and TT-23. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance one of the boreholes deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 55 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater source areas, and secondarily, to obtain additional information regarding the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect an unfiltered groundwater sample from the top 5 ft of shallow groundwater in each borehole for VOC analyses. CRA will collect a soil sample from each borehole in Area 4 for VOC analyses, in accordance with the soil sample collection criteria specified in Section 2.0.

2.5 AREA 5 - GP15-09/VAS-08 / TT-9 VOCS AND PCBS

The Respondents propose to advance 18 boreholes in the vicinity of GP15-09, VAS-08, and TT-9 to determine the possibility of additional sources of VOCs and PCBs, and provide additional delineation. Area 5 on Figure 1 presents the approximate locations of the proposed boreholes near GP15-09, VAS-08, and TT-9. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance a subset of the boreholes (i.e., 1 in

4) deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 60 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater contamination source areas, and secondarily obtain additional information regarding the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect an unfiltered groundwater sample from the top 5 ft of shallow groundwater at each borehole for VOC analyses. CRA will collect filtered groundwater samples for PCB analyses from 1 in every 4 locations (based on a spatial distribution) to determine possible contamination from reported transformer disposal on Parcel 5172, CRA will collect a soil sample from each borehole in Area 5 for VOC analyses, in accordance with the soil sample collection criteria specified in Section 2.0. CRA will collect a soil sample from 1 in every 4 boreholes (based on a spatial distribution) for PCB analysis. Samples for PCB analysis in soil and groundwater will be collected from boreholes located near the area of reported transformer disposal on Parcel 5172. Should evidence of potential PCB contamination be identified in the field, CRA will discuss the need for additional sample collection with the USEPA representative on Site.

2.6 AREA 6 - GP13-09/VAS-09

The Respondents propose to advance 15 boreholes in the vicinity of GP13-09 and VAS-09 to determine the possibility of a source of chlorinated VOCs, and investigate information from the Edward Grillot 2012 deposition regarding possible dumping of drum contents in this area. Area 6 on Figure 1 presents the approximate locations of the proposed boreholes near GP13-09, VAS-09, and TT-10. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance a subset of the boreholes (i.e., 1 in 4) deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 56 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater contamination source areas, and secondarily obtain additional information regarding the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect an unfiltered groundwater sample from the top 5 ft of shallow groundwater at each borehole for VOC analyses. CRA will collect filtered groundwater samples for naphthalene and metals analyses from 1 in every 4 locations (based on a spatial distribution), in order to determine possible metals and naphthalene contamination observed in the vicinity of VAS-09. CRA will collect soil samples for VOC analyses, in accordance with the soil sample

collection criteria specified in Section 2.0. Should evidence of potential naphthalene or metal contamination be identified in the field, CRA will discuss the need for additional sample collection with the USEPA representative on Site.

2.7 MW-210 – TCE IN GROUNDWATER

The Respondents propose to complete additional investigation in the vicinity of MW-210 to determine the concentrations of VOCs and naphthalene in shallow groundwater to determine if the groundwater concentrations at the investigated locations are greater than USEPA MCLs, USEPA Tapwater criteria, or concentrations calculated from USEPA RSLs for gas inhalation. Additionally, the Respondents propose to determine TCE concentrations in shallow groundwater in the vicinity of MW-210 to evaluate possible sources of the shallow TCE contamination detected in groundwater samples collected from MW-210. In accordance with USEPA comment 8a, dated March 12, 2013, the OU1 Phase 1A investigation will start with the MW-210 area boreholes.

CRA will advance eight boreholes to the south and east of the MW-210 monitoring well nest at an initial distance interval of 20 ft along the southern fence line. To the north of the MW-210 monitoring well nest, CRA will advance three boreholes at an initial distance interval of 40 ft. CRA will advance 18 boreholes on-Site along the Site boundary in accordance with the Dispute Resolution Agreement. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance a subset of boreholes (i.e., 1 in 4) deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 60 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater contamination source areas, and secondarily obtain additional information regarding the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect a groundwater sample from the top 5 ft of shallow groundwater at each borehole for VOC (unfiltered) analyses. CRA will collect groundwater samples for metals (filtered) and naphthalene analysis from every 1 in 4 locations (based on a spatial distribution). Should evidence of metal or naphthalene contamination be identified in the field, CRA will discuss the need for additional sample collection with the USEPA representative on Site. CRA does not propose soil sample collection from the boreholes in the vicinity of MW-210. Figure 2 presents the approximate locations of the proposed boreholes near MW-210. If the upgradient borehole locations fail to identify a source of contaminants at MW-210, additional boreholes may be required in Phase 1B.

2.8 TP-3 CHLOROBENZENE

The Respondents proposes to advance four additional Geoprobe boreholes in the vicinity of TP-3 on Parcel 5177 to investigate the horizontal and vertical extent of chlorobenzene impacts in soil near TP-3, and the potential pathway of chlorobenzene leaching from soil to groundwater. CRA will advance the boreholes to a minimum of 5 ft below the water table (i.e., 30 ft bgs). CRA will attempt to advance the boreholes deeper to the top of the till layer (where till is present) or a depth of approximately 675 ft AMSL (i.e., 50 ft bgs), which corresponds approximately to the interface between the Upper Aquifer and Lower Aquifer Zones beneath the Site, in order to primarily identify groundwater contamination source areas, and secondarily obtain additional information regarding the limits of waste in this area. If the limit of waste is not reached to a depth of approximately 675 ft AMSL, CRA will attempt to advance the borehole(s) deeper, if possible.

CRA will collect a groundwater sample from the top 5 ft of shallow groundwater observed in each borehole. The proposed borehole locations are presented on Figure 3. In accordance with the previous specifications, the Respondents propose to collect soil and unfiltered groundwater samples from each borehole in the vicinity of TP-3 for VOC analyses, in accordance with the sample collection criteria specified in Section 2.0.

CRA will complete this portion of the investigation early on, in order to obtain data expeditiously, which will allow for the collection of additional samples should this be required.

3.0 OU1 DATA GAPS TEST TRENCH INVESTIGATION

CRA completed a geophysical investigation in 2008. The Geophysical Investigation identified numerous anomalies at the Site. Some areas of the Site were not included in the geophysical survey due to the presence of physical obstructions or cultural interferences. In some cases, the geophysical anomalies may extend onto unsurveyed areas.

The EM 61 geophysical survey results indicated that the majority of the central portion and Dryden Road parcels of the Site (i.e., Parcel 5177, Parcels 5173, 5174, 5175, and 5176) were characterized by anomalous fill and waste, including suspected fly ash, slag, foundry sand, reinforced concrete, and/or buried metal objects. The magnetic anomalies detected on Parcel 5177 are likely associated with former access roads, air curtain destructor infrastructure, and buried metal waste.

CRA identified a geophysical anomaly in close proximity to TT-21 on Parcel 5054. While a number of drums have been removed from this area, the presence of the geophysical anomaly

and observations of drums or drum carcasses present in the sidewalls of the excavation completed in 2000 indicate that drummed wastes may remain at this location. See Figure 3 for locations.

CRA identified a geophysical anomaly in close proximity to TT-23 on Parcel 5171, which is the approximate location where a UST was removed from the former Custom Deliveries facility. The geophysical anomaly is believed to be the concrete base to which a UST was historically secured. According to the Underground Storage Tank Closure for Custom Deliveries, Inc. at 1951 Dryden Road, Moraine, Ohio report prepared by Associated Environmental, Inc., the concrete base was left in place at the time that Custom Deliveries removed the UST.

CRA identified additional geophysical anomalies in the following areas:

- Approximately 100 ft southwest of VAS-09 and 200 ft west of GP13-09, on Parcel 5177
- Approximately 200 ft southeast of TP-3, on Parcel 5177
- Approximately 150 ft northwest of MW-225, on Parcel 5171
- Approximately 360 ft north of MW-225, on Parcel 5171

The locations of the geophysical anomalies are shown on Figure 3. CRA proposes excavation of test trenches in these areas to investigate the nature of these anomalies.

3.1 SCOPE OF THE OU1 DATA GAPS TEST TRENCH INVESTIGATION

Test trenches are proposed in locations where the Respondents would like to investigate geophysical anomalies identified at the Site. CRA will visually identify and record the nature and depth of fill material above the water table. The Respondents will use this information to verify the limits of fill and to assist in characterizing the nature of the landfilled materials present in the areas investigated.

CRA will complete excavations to the top of the water table, where possible (as limited by the ability of the excavator to reach the top of the water table, the stability of the walls of the excavation, and/or the presence of obstructions). If CRA encounters an obstruction during the excavation of a test trench, CRA will adjust the location of the trench to avoid the obstruction. If excavation to the water table is not possible due to the depth of the water table or the stability of the fill material, the Respondents will consider the need for additional investigation at the location in question during future investigation work. CRA will assess the potential impacts from saturated fill materials as part of the groundwater investigation described above.

CRA will excavate the test trenches in the locations shown on Figure 3. Each test trench will be approximately 30 feet long by 3 feet wide, and will extend to the water table (if this depth can be excavated to safely). CRA will determine the vertical limit of fill material by the presence of undisturbed native soil in the excavation. CRA will also note if fill material appears to consist of re-located spoil from gravel extraction operations versus undisturbed native soil. Test trench excavation will continue in these areas to the depth of native material or the maximum reach of the excavator, whichever is less. CRA will visually identify and record the nature and depth of the fill. The procedures and equipment to be used to excavate trenches and visually characterize the fill are described in Appendix J-C of the FSP.

4.0 WETLANDS DELINEATION AND ASSESSMENT

The Respondents propose to complete a wetland delineation and assessment for the Large and Small Pond areas. CRA will request a Jurisdictional Determination (JD) from the U.S. Army Corps of Engineers (USACOE) to determine any Federal or State jurisdiction over these areas. The USACOE is the lead agency for conducting JDs in Ohio.

The appropriate jurisdictional authority over a wetland or water body in Ohio is determined by obtaining a JD and is dependent on whether the wetland is hydrologically isolated or is hydrologically connected to or adjoining Traditionally Navigable Waters of the U.S. (TNW). The USACOE regulates wetlands and water bodies that are hydrologically connected to or adjacent to TNW under Section 404 of the Clean Water Act (CWA). Typically, the USACOE does not have jurisdiction over isolated wetlands. However, they can assert jurisdiction if the isolated wetlands are adjacent to a TNW and a significant nexus exists between the isolated wetlands and an adjacent TNW. The Ohio EPA regulates isolated wetlands under their isolated wetland regulatory program that are otherwise not regulated by the USACOE.

CRA will complete a wetland delineation to determine if the Large and Small Pond Areas are isolated or not. If the Large and Small Pond Areas are isolated and determined not to be Jurisdictional Waters of the U.S., then CRA will assess these areas in accordance with Ohio EPA methodologies (ORAM 5.0) to determine their resource value classification (i.e., Category 1, 2, or 3 wetlands). The Category of an isolated wetland (Category 1, 2, or, 3) influences the permitting standards and mitigation requirements under Ohio EPA requirements.

For Superfund sites, the Ohio EPA requires that remediation that adversely affect a wetland under their jurisdiction comply with the substantive requirements of OAC-3745-1-54 for wetland anti-degradation. The USACOE may require a permit (Nationwide Permit 38) if these wetlands fall under their jurisdiction or require substantive compliance with the USACOE permitting standards. If the wetland survey concludes that the Large Pond and Small Pond are

regulated wetlands by either Ohio EPA or the USACOE, then the agency with jurisdiction would require compensatory wetland mitigation in accordance with their regulations and policies for any wetlands destroyed during remediation. The wetland mitigation requirements will be determined following completion of the wetland delineation, JD, and assessment in accordance with USACOE or Ohio EPA guidance, as applicable.

5.0 SCHEDULE

CRA will commence field work within two weeks of receipt of USEPA approval of the Work Plan, dependant on Geoprobe drilling subcontractor availability. The schedule for the OU1 Groundwater and Data Gap Investigation is presented in Attachment C.

CRA plans to use a single excavator to complete the test trenching; however, a second excavator and field crew will be added if scheduling constraints so dictate.

The Respondents will provide USEPA with verbal notification of field work at least 14 calendar days in advance of their initiation.

If significant changes or modifications to the proposed scope of work presented herein are required, CRA will contact USEPA for approval prior to implementing the changes, unless the changes are required for emergency or safety-related reasons.

6.0 REPORTING

CRA will post the validated analytical results to the South Dayton Dump and Landfill ftp site upon validation. CRA will also post stratigraphic information to the ftp site as soon as it is compiled from the field notes. The Respondents will summarize results and propose locations for additional phases of the Groundwater Investigation in accordance with the schedule presented in Attachment C. The monthly progress reports required by the ASAOC will include information about this investigation.

CRA will summarize and present the Phase 1A Groundwater investigation results Phase 1A Groundwater Investigation Summary Report. The draft report will include a description of the field work completed, any deviations from this Work Plan and the rationale behind the change, photographs, stratigraphic logs, field sampling data sheets, analytical summary tables, and analytical data reports. The draft report will include proposals and rationale for the Phase 1B (Monitoring well installation) and Phase 2A (Vertical Aquifer Sampling) investigations. CRA will finalize the report following receipt of comments from USEPA. The Phase 1A

CONESTOGA-ROVERS
& ASSOCIATES

May 10, 2013 Reference No. 038443-73

Groundwater Investigation Summary Report is anticipated to be submitted to USEPA and Ohio EPA in August 2013, in accordance with the schedule.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Stephen M. Quigley

VC/ac/8
Encl.

cc: Tim Prendiville, USEPA
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Tim Hoffman, Dinsmore & Shohl
Bryan Heath, NCR
Karen Mignone, Verrill Dana
Adam Loney, CRA
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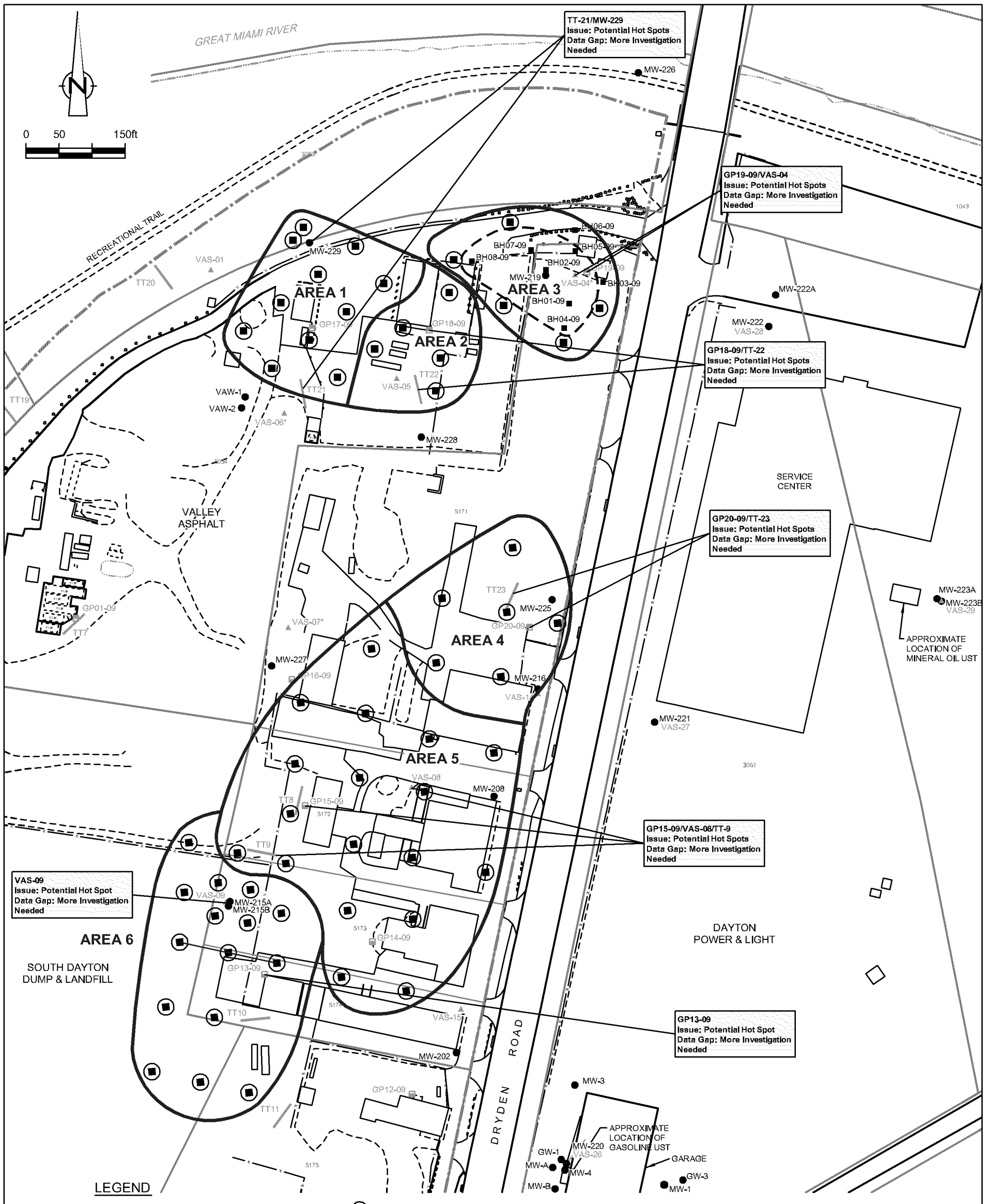

figure 1

PROPOSED PHASE 1A OU1 GROUNDWATER INVESTIGATIVE LOCATIONS
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

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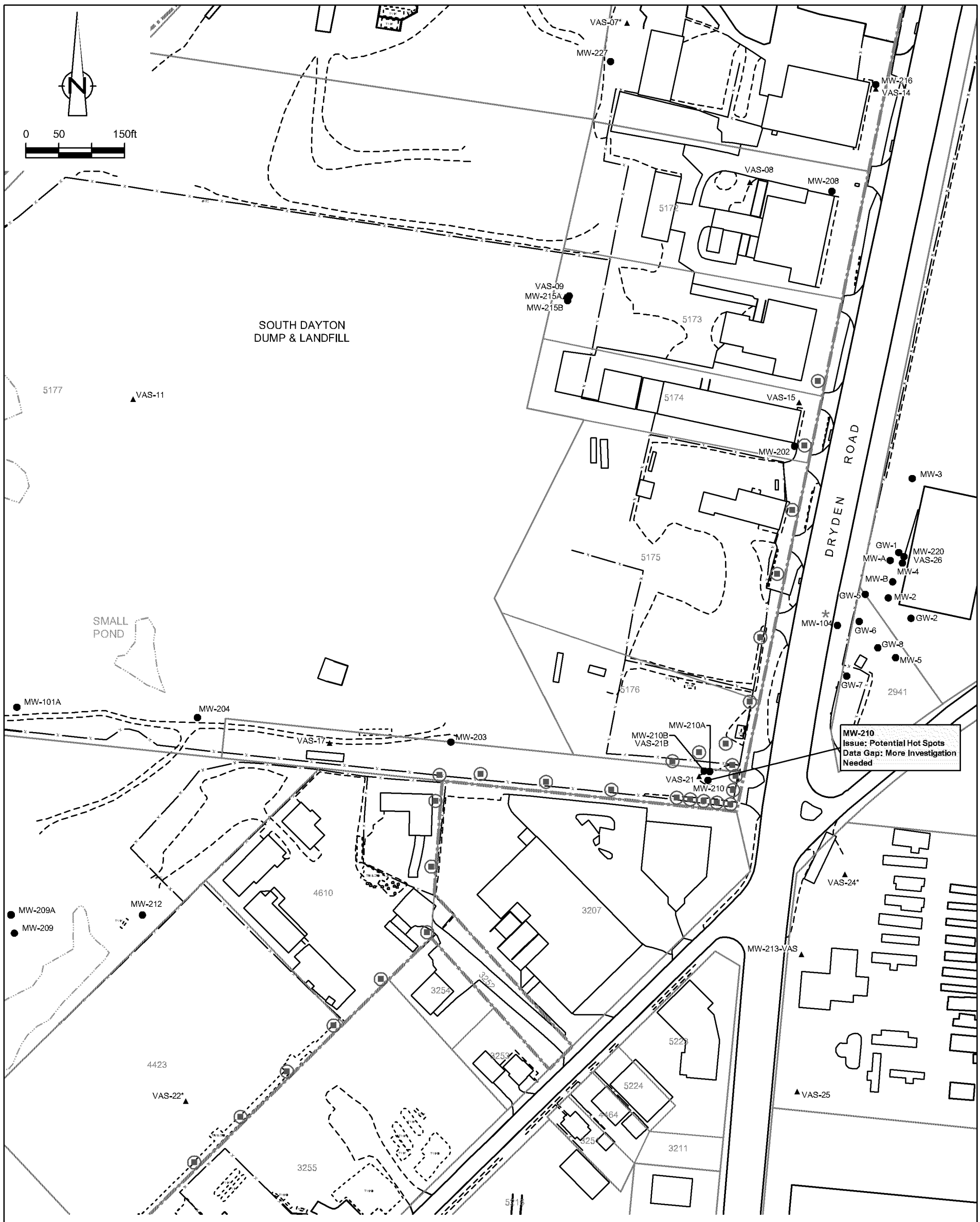

LEGEND

- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 3636 PARCEL NUMBER
- MW-206 ● UPPER AQUIFER MONITORING WELL LOCATION
- VAS-01 ▲ VERTICAL AQUIFER SAMPLING LOCATION
- * VAS LOCATION COMPLETED TO 70 FEET BELOW GROUND SURFACE OR LESS
- PROPOSED GROUNDWATER SAMPLING LOCATION

figure 2

PROPOSED MW-210 GROUNDWATER INVESTIGATIVE LOCATIONS
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

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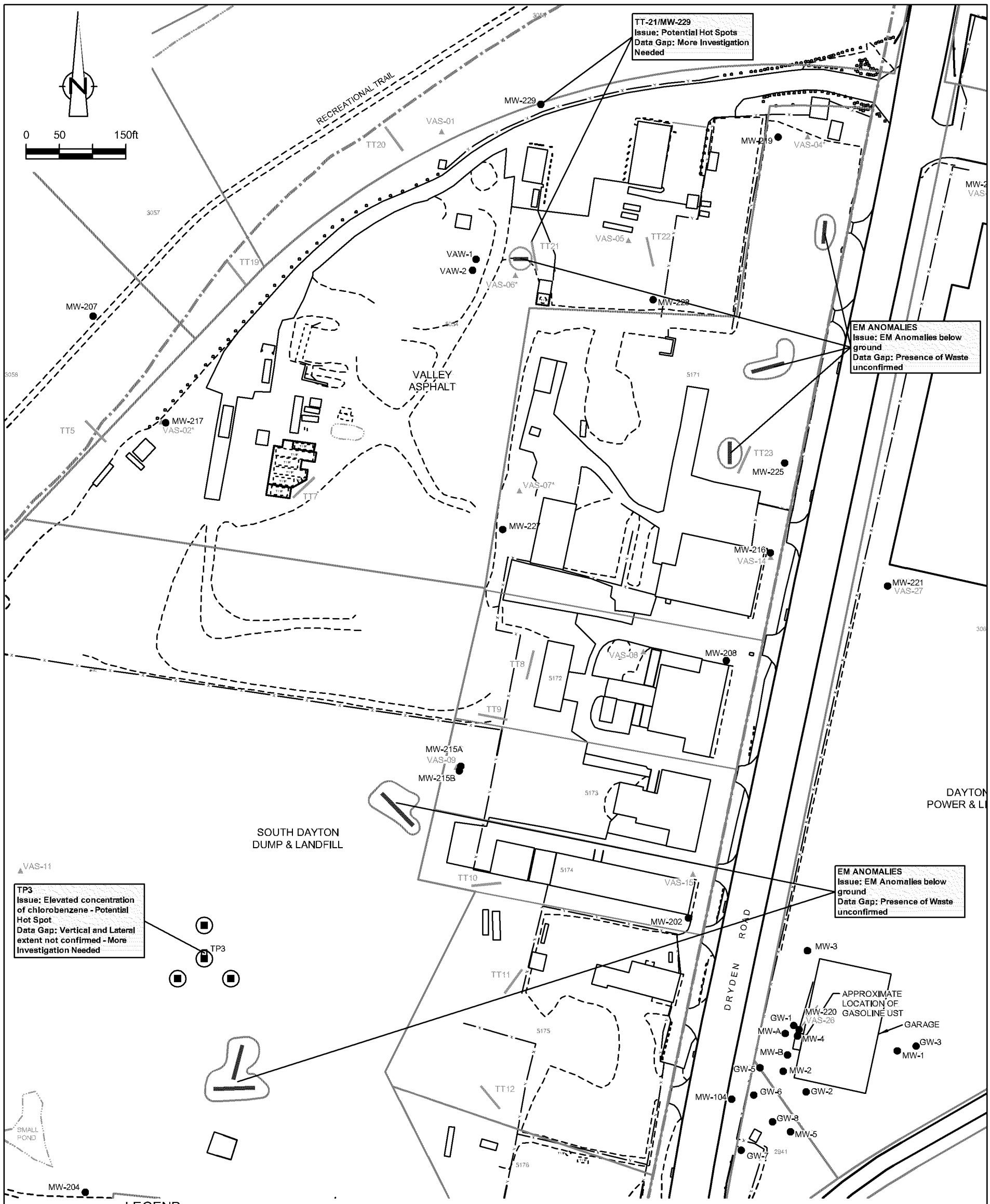

figure 3

PROPOSED PHASE 1A TEST PIT/TRENCH LOCATIONS
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

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ATTACHMENT A

TABLE A.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - PHASE 1A GROUNDWATER INVESTIGATION
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*General* / *OU1 Groundwater Investigation*	*Phase 1A* / *Geoprobe Investigation* / *Source or Data Gap Area Site Investigations*
1	***State the Problem***		
	i) Problem description:	Insufficient information exists to develop remedial alternatives to address migration of contaminated groundwater and landfill gas beneath the Site. Information regarding the potential for contaminated groundwater to migrate off-Site is required in order to develop a remedy decision.	Groundwater samples from a number of on-Site wells and Vertical Aquifer Sampling (VAS) locations contain contaminants at concentrations greater than MCL RSLs. The nature and extent of potential areas of on-Site groundwater contamination have not been fully delineated. Further investigation and sampling is required to delineate the vertical and lateral extent of contamination in areas of concern, and areas with low density of groundwater data and identify the direction of contaminant migration. The following are OU1 shallow on-Site groundwater areas of concern, or data gaps (discussed in further detail in draft OU1 RI/FS) - VAS-9 (cis-1,2-DCE; TCE, VC) - VAS-8 (TCE, possibly related to VAS-9 source) / TT-9 - VAS-15 (TCE, related to VAS-9 source) - VAS-04/MW-219 (LNAPL) - MW-210 (TCE) - TT-21 / MW-229 (VOCs and TCLP lead /TCE) - TT-22 / GP18-09 (VOCs in soil and soil gas, TCLP lead / methane) - TT-23 / GP20-09 (TCE and lead / chlorinated solvents) Soil contamination and geophysical anomalies at several locations have not been completely investigated to date and present data gaps. Other data gap areas to be further investigated during Phase 1 GW Investigation, using test pit or test trench techniques or soil boreholes, include: - TP-3 (16 ft bgs) chlorobenzene soil concentration - Geophysical Anomalies in the areas of TT-21, TT-23, TP-3, VAS-9, and two anomalies along 1951 Dryden Road, Parcel 5171 - Large Pond and landfill entrance #3, where drums were reportedly dumped
	ii) Planning team	See note at bottom	
	iii) Conceptual model	See attached figure and detailed descriptions at right.	- Shallow groundwater has been demonstrated to typically flow west/southwest across the Site and/or radially (in the northern part of the Site) towards the Great Miami River (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. - Contaminants in shallow groundwater can also migrate to the Lower Aquifer Zone, or to off-Site downgradient areas at concentrations greater than Action Levels. - During flood events, groundwater flow is occassionally reversed and migrates from the GMR to the Site.
	iv) General intended use for data	To assist in the development of remedial alternatives for groundwater contamination originating from the Site that is, or has the potential to migrate off Site and, to further investigate the groundwater contamination identified to date.	The data from initial screening level investigations will be used to guide subsequent investigations (i.e. determine location of permanent monitoring wells). The data will be compared against health-based risk values and applicable USEPA MCL RSL criteria.
	v) Resources, constraints, deadlines	Determination or confirmation of off-Site groundwater migration is constrained by access agreements to off-Site land parcels. Available water quality data from existing wells will be utilized to the degree possible in determining the spatial extent of contaminated groundwater. All areas of groundwater contamination or having the potential to result in groundwater contamination may not have been identified and the size of the landfill and potential presence of more widespread, low level concentrations of contaminants may render such identification difficult or infeasible.	

TABLE A.1

SUMMARY OF DATA QUALITY OBJECTIVES (DQO) PROCESS - PHASE 1A GROUNDWATER INVESTIGATION
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

DQO Step	*Investigation Phase:* / *Investigation Item:*	*General* / *OU1 Groundwater Investigation*	*Phase 1A* / *Geoprobe Investigation* / *Source or Data Gap Area Site Investigations*
2	***Goals of the Study:***		
	i) Primary study question	Does groundwater contamination that exists on-Site migrate, or have the potential to migrate, off-Site or pose an unacceptable risk to on-Site receptors; and, therefore, requires containment and/or treatment?	Do investigated on-Site areas of concern or data gap areas contain groundwater at concentrations greater than Action Levels?
	ii) Alternate outcomes or actions	The groundwater investigation may lead to the following outcomes: i. Groundwater contamination beneath the Site is migrating or potentially could migrate off-Site or pose a risk to on-Site receptors and originates from diffuse contaminant sources that cannot be readily identified or from identifiable source areas ii. Groundwater contamination exists beneath the Site and off-Site that originates from off-Site sources that should be further assessed and, if necessary, remediated. iii. Groundwater contamination originating from the Site is not migrating and does not pose a risk to on-Site receptors, and does not have the potential to migrate off-Site. Outcomes i. through iii. are not mutually exclusive and a combination of these outcomes may occur. See details at right for specific investigations.	Investigation of on-Site areas of concern or data gap areas will either: i. reveal on-Site areas of greater contaminant concentrations. Further investigation may be required to delineate Site-related area(s) of groundwater contamination. ii. Site areas of greater contaminant concentrations are not identifed, indicating further investigation may be required, or further off-Site investigation may be warranted, or there are diffuse, low concentration sources distributed throughout the landfill that are continuing to release contaminants to groundwater. Additional evaluation and discussion with EPA will be required if this is the outcome to determine the appropriate next step(s).
	iii) Type of problem (decision or estimation)[1]	Decision (Action Level)	Decision (Action Level)
	iv.a) Decision statement	See details at right for specifc investigations	Determine if the locations of contaminant exceedances under the Site indicate potential Site-related contamination.
	iv.b) Estimation statement & assumptions	N/A	N/A
3	***Identify Information Inputs:***		
	i) Information types needed	See specific details at right for each Phase of the investigation. Additional information types necessary to select an appropriate groundwater remedy will become clearer once groundwater chemistry data are collected. Data gaps will be discussed with USEPA as they arise and new DQOs formulated as necessary. Inputs may include soil or aquifer physical or chemical parameters or characteristics. If appropriate, historic data will be used.	This would be a new data collection effort, with installation of temporary Geoprobe wells, collection of low-flow groundwater samples from the Upper Aquifer Zone groundwater. Groundwater samples collected from temporary Geoprobe wells will be collected for TCL VOCs and TAL metals. Samples will be collected for analysis of additional analytes (e.g., TCL SVOCs, PCBs, pesticides and herbicides) from areas of known or suspected non-VOC/metals contamination.
	ii) Information sources	New data from the investigation will form the main basis of assessment. Any suitable results from previous monitoring of existing wells and VAS locations will be considered during interpretation of the data obtained.	
	iii) Basis of Action Level	See specific details at right for each Phase of the investigation.	Groundwater Action Levels as agreed with USEPA are: 1) USEPA MCLs 2) USEPA RSLs for tapwater 3) Concentrations calculated from USEPA RSLs for gas inhalation according to the method in USEPA-approved guidance Respondents will evaluate the analytical results against MCLs where available. Where MCLs are not available, RSLs for tapwater will be compared to the individual contaminant concentrations for screening purposes. Volatile contaminant levels will also be compared to groundwater action levels calculated from USEPA's RSLs for inhalation.
	iv) Appropriate sampling & analysis methods	Methods are described in the Field Sampling Plan (CRA, January 2011), the Final Groundwater Investigation Letter Work Plan (CRA, May 7, 2008), and in accordance with the Quality Assurance Project Plan (CRA, September 2008).	

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DQO Step	*Investigation Phase:* / *Investigation Item:*	*General* / *OU1 Groundwater Investigation*	*Phase 1A* / *Geoprobe Investigation* / *Source or Data Gap Area Site Investigations*
4	*Define the Boundaries of the Study:*		
	i) Target population, sample units	See specific details at right for each Phase of the investigation.	Target population is contaminants in the Upper Aquifer Zone groundwater at locations agreed upon with USEPA. Sampling units are groundwater samples collected at individual temporary wells.
	ii) Specify spatial boundaries	See specific details at right for each Phase of the investigation.	The spatial boundaries for the study area include the Upper Aquifer Zone groundwater in the OU1 shallow on-Site groundwater areas of concern or data gap areas, previously outlined in DQO Step 1i.
	iii) Specify temporal boundaries	See specific details at right for each Phase of the investigation.	The temporal boundaries are based on the project schedule. Each Geoprobe temporary monitoring well installation is a single time point event, which will not be repeated.
	iv) Identify any other practical constraints	See specific details at right for each Phase of the investigation.	Site boundaries enclosed by fenceline may limit the proximity of boreholes and temporary monitoring wells to the Site boundaries.
	v.a) Scale of inference for decision making	See specific details at right for each Phase of the investigation.	Comparisons to Action Levels and/or upgradient conditions will be carried out on an individual-location basis.
	v.b) Scale of estimates	N/A	N/A
5	*Develop the Analytic Approach:*		
	i.a) Specify Action Level	See specific details at right for each Phase of the investigation.	1) USEPA MCL RSL criteria 2) Cancer risk >10^{-6} to 10^{-4} 3) Hazard Index > 1 (noncarcinogens)
	i.b) Specify estimator	N/A	N/A
	ii.a) Specify population parameter of interest and theoretical decision rule	See specific details at right for each Phase of the investigation.	All exceedances of action levels (for protection of any point within aquifer)
	ii.b) Specify estimation procedure	N/A	N/A
6	*Specify Performance or Acceptance Criteria:*		
	i.a) Set baseline (null) and alternative hypotheses	See specific details at right for each Phase of the investigation.	Baseline H_0: groundwater sample concentrations are less than Action Levels Alternative H_1: groundwater sample concentrations are greater than Action Levels
	i.b) Specify how uncertainty accounted for in estimate	N/A	N/A
	ii.a) Determine impact of decision errors (false positives/negatives)	See specific details at right for each Phase of the investigation.	N/A - since comparing to maximum value, no statistical test is employed

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	ii.b) Specify confidence level for estimate	N/A	N/A
	iii) Specify "gray region" for test	See specific details at right for each Phase of the investigation.	N/A - since comparing to maximum value, no statistical test is employed
	iv.a) Set tolerable limits on decision errors	See specific details at right for each Phase of the investigation.	N/A - since comparing to maximum value, no statistical test is employed
	iv.b) Specify performance or acceptance criteria	N/A	N/A
7	*Develop the Plan for Obtaining Data:*		
	i) Select sampling design	See specific details at right for each Phase of the investigation.	Geoprobe boreholes will be advanced at locations agreed-upon between USEPA and Respondents. Following completion of the investigation, the Respondents will recommend additional temporary boreholes, permanent monitoring wells, or remedial activities in order to further define or mitigate unacceptable risks posed by contaminants in shallow groundwater in areas of concern. Proposed Geoprobe borehole locations will be based on historical and physical knowledge of the underlying Site condition, and will include areas previously identified as potential source areas or data gaps. The locations will be selected to provide information regarding the lateral distribution of contaminants at areas of concern.
	ii) Specify/evaluate key assumptions supporting the design	See specific details at right for each Phase of the investigation.	The basis of comparison for the selected Action Levels (MCL RSLs, target risk or hazard index) is using individual groundwater samples, which therefore do not require statistical assumptions for testing.

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.

(2) USEPA Guidance establishes an area within 100 ft vertically or laterally from a volatile concentration of regulatory concern as a potential impact area. VOC emissions tend to be insignificant at lateral distances of approximately 100 ft transgradient to groundwater flow from a source. (ITRC, January 2007, Vapor Intrusion Pathway. USEPA, 2002, OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils.)

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

The planning team includes: Steve Quigley (CRA Project Director); Adam Loney (CRA project manager); Wesley Dyck (CRA statistics expert); April Gowing, Steve Harris, Vincent Nero and Dan Smith (CRA risk assessment experts); Paul Wiseman and Rawa Fleisher (CRA chemists/quality assurance staff); Valerie Chan (CRA project engineer); Alan Deal (CRA project hydrogeologist); Leslie Patterson(USEPA Regional Project Manager); Laura Marshall(Ohio EPA representative); and property owner stakeholders.

ATTACHMENT B

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
TT-21 / MW-229	TCE was detected at a concentration of 70 µg/L in a GW sample collected from MW-229 at a well screen depth of 22 – 32 ft bgs (straddling the water table). The TCE concentration was greater than the USEPA MCL of 5 µg/L. TT-21 soil concentrations of VOCs were greater than non-conservative USEPA soil screening levels (SSLs) for GW protection. A sample collected from material in a drum excavated at TT-21 (7 ft bgs) contained benzene, PCBs, lead, and naphthalene at concentrations greater than SSLs for groundwater protection, and USEPA Industrial Soil Regional Screening Levels (RSLs).	1	1	11 Geoprobe Boreholes	VOC GW analysis at each location Metals, PCBs and naphthalene GW analyses at 25% of locations VOC soil samples from all boreholes. PCB soil samples from 2 boreholes in vicinity of TT-21	To a minimum of 5 feet below the water table. CRA will attempt to extend a subset of boreholes (i.e., 1 in 4) deeper to the top of till layer (where present) or a depth of approx. 675 ft AMSL / 60 ft bgs to identify groundwater contamination source areas and the limits of waste in the area.	Investigate the presence of TCE groundwater contamination in the vicinity and upgradient of MW-229. Investigate the extent of potential soil and groundwater PCB contamination from drum contents excavated from TT-21 (7 ft bgs).

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
GP18-09 / TT-22	The soil concentration of ethylbenzene collected from TT-22 (6 ft bgs) was greater than USEPA Industrial Soil criteria. Concentrations of benzene, ethylbenzene, and vinyl chloride (VC) in soil samples from TT-22 were greater than SSLs for GW protection. GP18-09 soil gas sample contained methane at concentrations greater than the UEL, and benzene, naphthalene and VC that corresponded to excess cancer risks greater than 1×10^{-3}.	1	2	5 Geoprobe boreholes	VOC GW samples VOC soil samples from all boreholes	Soil samples will be collected from boreholes in the vicinity of TT-22 down to and including the deepest, unsaturated interval. To a minimum of 5 feet below the water table. CRA will attempt to extend all 5 boreholes deeper to the top of till layer (where present) or a depth of approx. 675 ft AMSL / 60 ft bgs.	Determine whether VOCs in soil have resulted in shallow groundwater contamination. Also determine whether groundwater contamination is a source of VOCs in soil vapor at GP18-09. Additional boreholes in area will provide further delineation.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
GP19-09 / VAS-04	Residual LNAPL was observed at the GW interface zone. CRA has not observed free-phase LNAPL in the monitoring well MW-219 installed in the approximate center of the LNAPL area. The soil gas sample collected from GP19-09 contained vinyl chloride at a concentration that corresponds to an excess cancer risk of 1.07×10^{-4}.	1	3	5 Geoprobe Boreholes Step out approx. 40 ft from any location where LNAPL is identified	Sudan IV dye test VOC, metals, TPH, and naphthalene GW analysis on the two boreholes located closest to the Site boundaries (i.e., north, and east) Measure NAPL, if any, in MW-219 Baildown Testing using a pump, Solubility Assessment No proposed soil sample collection	To a minimum of 5 feet below the water table.	Delineate the extent of residual LNAPL in the areas of BH04-09 and BH08-09. The LNAPL detected at BH04-09 and BH08-09 was of limited thickness and concentration as in samples collected from BH02-09 and BH07-09 (based on qualitative Sudan IV dye tests only), indicating that CRA advanced BH04-09 and BH08-09 near the boundaries of the plume. Determine if residual LNAPL is bound to soil and not present as a separate phase liquid on the groundwater surface. NAPL is a principal threat waste. Determine if contaminants from the residual LNAPL is migrating off-Site towards the Great Miami River.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
GP20-09 / TT-23	Chlorinated solvents were detected in the soil gas sample collected from GP20-09 at concentrations that correspond to excess cancer risks greater than 1×10^{-4}. A groundwater source has not been identified to date.	1	4	6 Geoprobe Boreholes	VOC GW samples VOC soil samples from all boreholes	To a minimum of 5 feet below the water table. CRA will attempt to extend 1 borehole deeper to the top of till layer (where present) or a depth of approx. 675 ft AMSL / 60 ft bgs.	Investigate the possibility that a source of chlorinated solvents may be present in the vicinity of GP20-09 and TT-23.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
GP15-09 / VAS-08 / TT-9	Ethylbenzene soil concentrations in samples from TT-9 (22 ft bgs) were greater than USEPA Industrial Soil criteria. Concentrations of benzene, cis-1,2-dichloroethene, ethylbenzene, TCE, and VC in soil samples collected from TT-9 were greater than SSLs for GW protection. The soil vapor sample from GP15-09 contained concentrations of cis-1,2-DCE, which correspond to a non-cancer hazard index of 122, and TCE and VC, which correspond to excess cancer risks greater than 1×10^{-3}. VOC concentrations in groundwater samples collected from VAS-08 were greater than USEPA MCL RSLs.	1	5	18 Geoprobe Boreholes	VOC and PCB GW samples VOC soil samples from all boreholes, and PCB soil samples from 1 in every 4 locations	To a minimum of 5 feet below the water table. CRA will attempt to extend a subset of boreholes (i.e., 1 in 4) deeper to the top of till layer (where present) or a depth of approx. 675 ft AMSL / 60 ft bgs .	Determine the possibility of additional sources of VOCs in the vicinity of GP15-09, VAS0-8, and TT-9 to provide additional delineation. Determine whether the source is a principal threat waste and a hot spot requiring remediation; an area that while not a hot spot is amenable to remediation; or an area requiring containment.
GP13-09 / VAS-09	Chlorinated solvent GW concentrations in samples collected from VAS-09 (27 – 32 ft bgs) were greater than USEPA MCL RSLs.	1	6	15 Geoprobe Boreholes	VOC GW analysis at each location Metals and naphthalene	To a minimum of 5 feet below the water table. CRA will attempt to extend a subset	Determine the possibility of a source of chlorinated VOCs in the vicinity of GP13-09 and VAS-09. Determine whether the source is a principal threat waste and a hot

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
	MW-215A /B were installed approx. 6.5 ft away from VAS-09. GW results for MW-215A/B did not correspond with VAS-09 results. The soil gas sample collected from GP13-09 contained vinyl chloride at a concentration that corresponds to an excess cancer risk greater than 1×10^{-3}. Drum contents were reportedly dumped in an area southwest of TT-10, based on information from the Edward Grillot 2012 deposition.				GW analyses on every 1 in 4 locations VOC soil samples from all boreholes	of boreholes (i.e., 1 in 4) deeper to the top of till layer (where present) or a depth of approx. 675 ft AMSL / 56 ft bgs.	spot requiring remediation; an area that, while not a hot spot, is amenable to remediation; or an area requiring containment. Additional boreholes in vicinity may also aid in delineation and serve to investigate information regarding disposal of drum contents.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
MW-210	TCE concentrations in groundwater samples have been consistently greater than the USEPA Maximum Contaminant Level (MCL). The maximum TCE concentration measured was 260 µg/L; the MCL is 5 µg/L.	2	NA	29 Geoprobe boreholes Upgradient boreholes will be completed first and samples will be submitted on a rush TAT	VOC GW analysis at each location Metals and naphthalene GW analyses on every 1 in 4 locations	To a minimum of 5 feet below the water table. CRA will attempt to extend a subset of boreholes (i.e., 1 in 4) deeper to the top of till layer (where present) or a depth of approx. 675 ft AMSL / 60 ft bgs.	• Determine whether TCE contamination in the Upper Aquifer Zone is migrating off-Site. • Determine if TCE concentrations are greater upgradient of MW-210, based on the predominant GW flow direction in this area of the Site from NE to SW. • Determine whether VOC contamination from on-Site sources is migrating off-Site in shallow groundwater in area of nearest potential off-Site receptors.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
Magnetic Geophysical Anomalies	Total field magnetic anomalies were identified on Parcels 5171 and 5177.	3	NA	6 Test Trenches	No sample collection proposed	Depth to the water table, if possible and feasible (as limited by the ability of the excavator to reach that depth, the stability of the walls of the excavation, and/or presence of obstructions). The test trenches may extend to approx.. 30 ft long by 3 ft wide.	Investigate four total field magnetic anomalies identified at the Site. The anomalies may be associated with disposal of small metallic objectives that were observed on and immediately below the ground surface (i.e., automotive brake drums, brake pads, other small car parts). Investigation is required to eliminate possibility that anomalies are due to buried drums or tanks which could be a potential source of ongoing contamination.

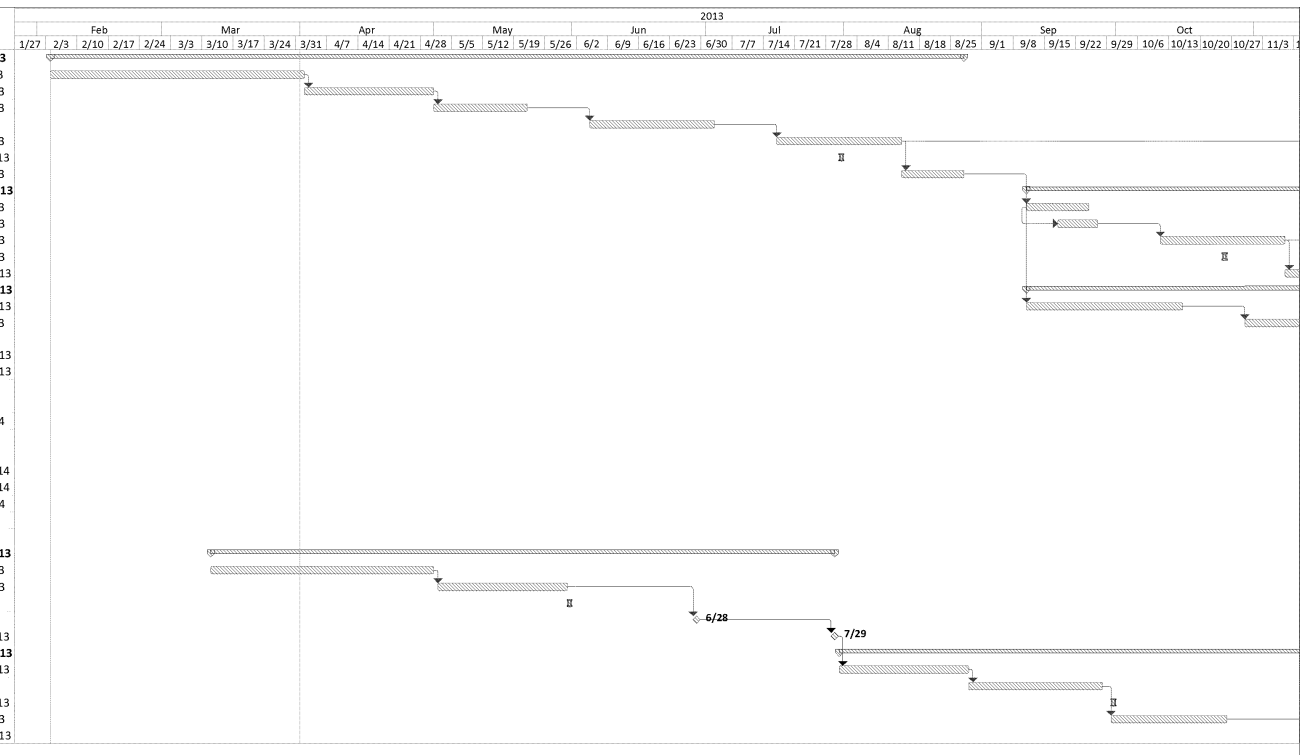
Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
EM Geophysical Anomalies	TT-21 geophysical anomaly was identified in the approximate area of the drum removal that occurred in 2000. In 2008, a buried drum was excavated from TT-21.	3	NA	1 Trench	No sample collection proposed; however, soil samples may be collected for VOC or other analysis if field screening indicates the possibility of soil contamination that could represent a hot spot.	Depth to the water table, if possible and feasible (as limited by the ability of the excavator to reach that depth, the stability of the walls of the excavation, and/or presence of obstructions). The test trench may extend to approx 30 ft long by 3 ft wide.	Investigate geophysical anomaly identified in the area of TT-21, which may be indicative of buried drum(s). Characterize the contents of any excavated drum. If hazardous, properly dispose of the drum off-Site.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
TP-3	Chlorobenzene soil concentration of 560 mg/kg, in sample collected at 16 ft bgs, which is greater than the soil screening value for GW protection, based on a cancer risk of 1 x 10^{-4} and a dilution attenuation factor of 10.	3	NA	4 Geoprobe Boreholes	VOC soil and GW analysis.	To top of till layer (where present) or a depth of approx. 675 ft AMSL / 50 ft bgs	• There is a potential risk of chlorobenzene leaching from soil to groundwater. The proposed Geoprobe boreholes are intended to investigate this potential pathway. • Investigate vertical and lateral extent of chlorobenzene soil contamination near TP-3.

Data Gap and Location	*Initial Results*	*Figure No.*	*Area No.*	*No. & Type of Proposed Investigative Locations*	*Proposed Analysis*	*Proposed Depth of Investigation*	*Rationale*
Large and Small Ponds	NA	NA	NA	NA	Wetland Survey	NA	• Determine if the Large and Small Ponds are classified as category wetlands. • Determine appropriate jurisdictional authority over the wetlands (if categorized): Ohio EPA or Army Corps of Engineers. • Determine applicable state or federal permits or remedial requirements, if the Site has classified wetlands areas. • Determine degree of offset (i.e., size and category) wetland required if site wetlands are destroyed during remediation activities, in accordance with Section 404 of the Clean Water Act, or Ohio Administrative Code 3745-54.

ATTACHMENT C

ID	Task Name	Duration	Start	Finish
1	**Phase 1A - OU1 Data Gap Investigation**	**147 days**	**Mon 2/4/13**	**Tue 8/27/13**
2	Submit Draft Work Plan	41 days	Mon 2/4/13	Mon 4/1/13
3	USEPA Review and Comment	21 days	Tue 4/2/13	Tue 4/30/13
4	Submit Final Work Plan and USEPA approval	15 days	Wed 5/1/13	Tue 5/21/13
5	Field Work: Data Gap Area Investigation	20 days	Wed 6/5/13	Tue 7/2/13
6	Summarize results; Propose Locations for Phases 1B and 2A investigations with rationale	20 days	Wed 7/17/13	Tue 8/13/13
7	Conference call to discuss results and proposed locations	1 day	Wed 7/31/13	Wed 7/31/13
8	USEPA Review and Comment, and Approval of Proposed Locations	10 days	Wed 8/14/13	Tue 8/27/13
9	**Phase 1B - OU1 GW Investigation**	**52 days**	**Wed 9/11/13**	**Thu 11/21/13**
10	Field Work: Installation of Permanent Wells	10 days	Wed 9/11/13	Tue 9/24/13
11	Field Work: Development and Sampling newly installed permanent wells	7 days	Wed 9/18/13	Thu 9/26/13
12	Summarize results; Propose Locations for additional investigation (if required)	20 days	Fri 10/11/13	Thu 11/7/13
13	Conference call to discuss results and proposed locations (if required)	1 day	Fri 10/25/13	Fri 10/25/13
14	USEPA Review and Comment and Approval of Proposed Locations (if required)	10 days	Fri 11/8/13	Thu 11/21/13
15	**Phase 2A - VAS GW Investigation**	**70 days**	**Wed 9/11/13**	**Tue 12/17/13**
16	Field Work: Advance VAS Boreholes	25 days	Wed 9/11/13	Tue 10/15/13
17	Summarize results; Propose locations for Phase 2B, and further VAS investigation (if required)	25 days	Wed 10/30/13	Tue 12/3/13
18	Conference call to discuss results and proposed locations	1 day	Thu 11/14/13	Thu 11/14/13
19	USEPA Review, Comment and Approval of Proposed Locations	10 days	Wed 12/4/13	Tue 12/17/13
20	**Phase 2B - Permanent Well installation**	**42 days**	**Mon 1/6/14**	**Tue 3/4/14**
21	Field Work: Installation of Permanent Wells	15 days	Mon 1/6/14	Fri 1/24/14
22	Field Work: Development and Sampling newly installed permanent wells	7 days	Mon 1/13/14	Tue 1/21/14
23	Summarize results; Proposed locations for further investigation (if required)	20 days	Wed 2/5/14	Tue 3/4/14
24	**OU1 RI/FS Report**	**118 days**	**Wed 3/5/14**	**Fri 8/15/14**
25	Submit Draft Report	54 days	Wed 3/5/14	Mon 5/19/14
26	USEPA Review and Comment	22 days	Tue 5/20/14	Wed 6/18/14
27	Conference call to discuss USEPA comments on OU1 RI/FS Draft Report	1 day	Thu 6/19/14	Thu 6/19/14
28	Submit Final RI/FS Report	19 days	Tue 6/24/14	Fri 7/18/14
29	USEPA Approval	20 days	Mon 7/21/14	Fri 8/15/14
30	**OU2 Scoping Document**	**100 days**	**Tue 3/12/13**	**Mon 7/29/13**
31	Submit Draft Report to USEPA	36 days	Tue 3/12/13	Tue 4/30/13
32	USEPA Review and Comment	21 days	Thu 5/2/13	Thu 5/30/13
33	Conference call to discuss USEPA comments on OU2 Scoping Document	1 day	Fri 5/31/13	Fri 5/31/13
34	Submit Final Report	18 days	Wed 6/5/13	Fri 6/28/13
35	USEPA Approval	21 days	Mon 7/1/13	Mon 7/29/13
36	**OU2 RI/FS Work Plan**	**85 days**	**Wed 7/31/13**	**Tue 11/26/13**
37	Submit Draft Work Plan	21 days	Wed 7/31/13	Wed 8/28/13
38	USEPA Review and Comment	22 days	Thu 8/29/13	Fri 9/27/13
39	Conference call to discuss USEPA Comments on OU2 RI/FS Work Plan	1 day	Mon 9/30/13	Mon 9/30/13
40	Submit Final Work Plan	20 days	Mon 9/30/13	Fri 10/25/13
41	USEPA Approval	22 days	Mon 10/28/13	Tue 11/26/13



Project: USEPA_draftSchedule_02
Date: Mon 4/1/13

Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Deadline | Progress

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14	USEPA Review and Comment and Approval of Proposed Locations (if required)	10 days	Fri 11/8/13	Thu 11/21/13
15	**Phase 2A - VAS GW Investigation**	**70 days**	**Wed 9/11/13**	**Tue 12/17/13**
16	Field Work: Advance VAS Boreholes	25 days	Wed 9/11/13	Tue 10/15/13
17	Summarize results; Propose locations for Phase 2B, and further VAS investigation (if required)	25 days	Wed 10/30/13	Tue 12/3/13
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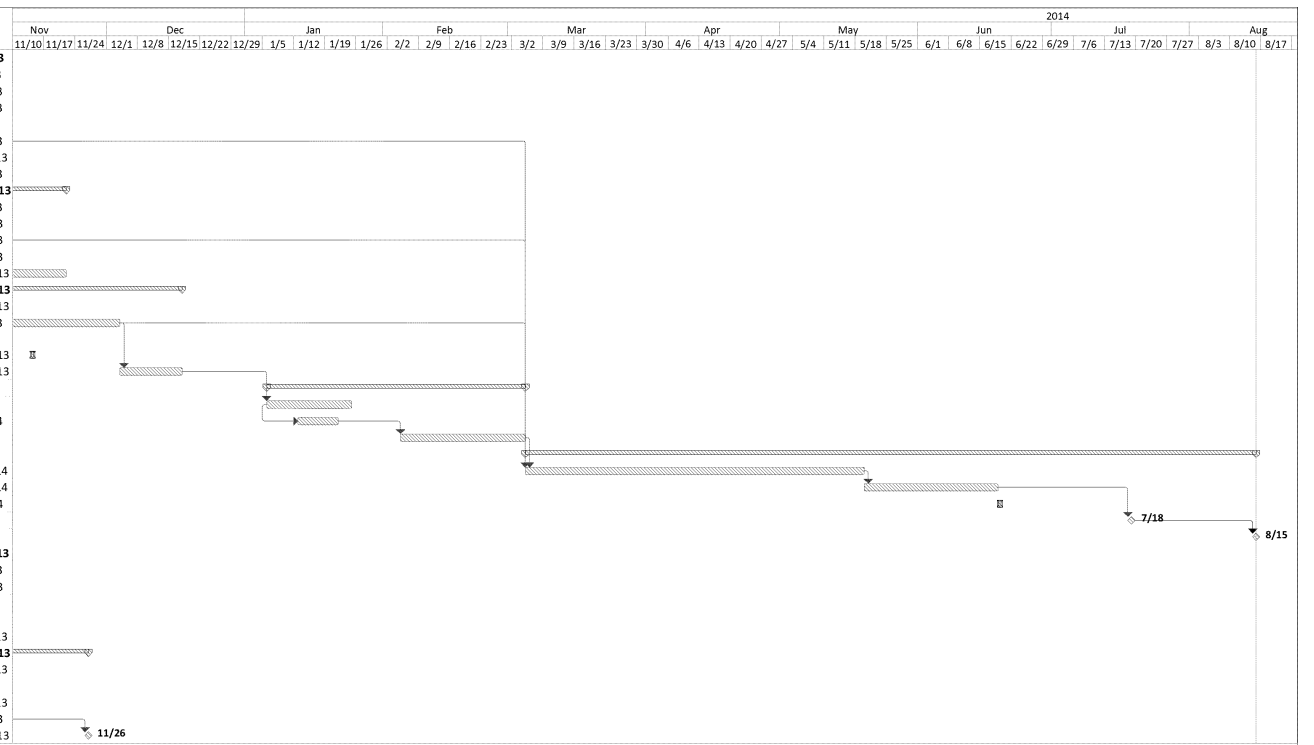
25	Submit Draft Report	54 days	Wed 3/5/14	Mon 5/19/14
26	USEPA Review and Comment	22 days	Tue 5/20/14	Wed 6/18/14
27	Conference call to discuss USEPA comments on OU1 RI/FS Draft Report	1 day	Thu 6/19/14	Thu 6/19/14
28	Submit Final RI/FS Report	19 days	Tue 6/24/14	Fri 7/18/14
29	USEPA Approval	20 days	Mon 7/21/14	Fri 8/15/14
30	**OU2 Scoping Document**	**100 days**	**Tue 3/12/13**	**Mon 7/29/13**
31	Submit Draft Report to USEPA	36 days	Tue 3/12/13	Tue 4/30/13
32	USEPA Review and Comment	21 days	Thu 5/2/13	Thu 5/30/13
33	Conference call to discuss USEPA comments on OU2 Scoping Document	1 day	Fri 5/31/13	Fri 5/31/13
34	Submit Final Report	18 days	Wed 6/5/13	Fri 6/28/13
35	USEPA Approval	21 days	Mon 7/1/13	Mon 7/29/13
36	**OU2 RI/FS Work Plan**	**85 days**	**Wed 7/31/13**	**Tue 11/26/13**
37	Submit Draft Work Plan	21 days	Wed 7/31/13	Wed 8/28/13
38	USEPA Review and Comment	22 days	Thu 8/29/13	Fri 9/27/13
39	Conference call to discuss USEPA Comments on OU2 RI/FS Work Plan	1 day	Mon 9/30/13	Mon 9/30/13
40	Submit Final Work Plan	20 days	Mon 9/30/13	Fri 10/25/13
41	USEPA Approval	22 days	Mon 10/28/13	Tue 11/26/13



Project: USEPA_draftSchedule_02
Date: Mon 4/1/13

Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Deadline | Progress