

Revitalizing Auto Communities Environmental Response  
Trust (RACER)

# **FIERO PROPERTY SOURCE INVESTIGATION SCOPE OF WORK**

**Pontiac North Campus Site**

September 7, 2021

# FIERO PROPERTY SOURCE INVESTIGATION SCOPE OF WORK

## Pontiac North Campus

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# 1 INTRODUCTION AND OBJECTIVE

This scope of work (SOW) describes the methods and approach for an investigation to address current data gaps at the former Fiero portion of the Revitalizing Auto Communities Environmental Response Trust (RACER) Pontiac North Campus properties (Site) located in Pontiac, Michigan (**Figure 1**). The SOW was prepared in response to groundwater impacts at the Site boundary in excess of Michigan Department of Environment, Great Lakes, and Energy (EGLE) site-specific vapor intrusion (VI) criteria. Details regarding current site conditions and data gaps at the former Fiero Assembly and Powerhouse properties was provided to the United States Environmental Protection Agency on August 13, 2021, as the *Conceptual Site Model – Pontiac North Campus – Former Fiero Properties report*.

The objectives of the investigation are as follows:

1. Further assess potential VI risks to off-site receptors, specifically adjacent to the two identified off-site residences located southwest of the Site (**Figure 1**).
2. Characterize groundwater impacts downgradient of potential source areas, and at the Site boundary, to define preferential pathways and help identify key upgradient source areas.
3. Identify and delineate potential key source areas contributing to groundwater impacts.
4. Install additional monitoring wells for a more robust monitoring network.

The proposed Scope of Work includes right-of-way permitting, utility locating, vertical aquifer profile borings (VAP), soil borings, soil vapor monitoring point installation (SVMP), monitoring well installation, and groundwater sampling.

## 1.1 BACKGROUND

As summarized in the Conceptual Site Model (CSM) report (Arcadis 2021), several data gaps were identified related to the Site. In general, these data gaps include:

- Exceedances of the residential EGLE Site-Specific Volatilization to Indoor Air Criteria (SSVIAC) for trichloroethylene (TCE) in groundwater at monitoring wells MW-06-20 and MW-08-21 located at the southwest Site boundary.
- Exceedances of the residential SSVIAC for TCE in soil vapor at soil vapor monitoring point SV-02-21 located at 23 feet below ground surface (ft bgs) at the southwest Site boundary.
- On-site source areas, current source strength and downgradient contaminant transport.
- Groundwater monitoring network and delineation.

Additional work will provide a better understanding of the CSM, including contaminant distribution and transport processes occurring on-site and assess potential vapor intrusion (VI) risks off-site.

## 2 SCOPE OF WORK

The Scope of Work is listed below and described in detail in the following sections:

- Permitting/notifications
- Utility locating
- Use of a mobile laboratory
- Off-Site VI Assessment
- VAP Investigation
- Source Characterization
- Monitoring Well Installation
- Reporting

Proposed boring locations for the SOW are shown on **Figure 2**.

### 2.1 Permitting/Notifications

A right-of-way (ROW) permit through the City of Pontiac will be obtained for one monitoring well abandonment, installation of two monitoring wells, and installation of four soil vapor monitoring point (SVMP) locations installed with the public right-of-way (ROW) east of the East Kennett Road.

### 2.2 Utility Locating

Prior to completing drilling activities, utility clearance will be performed using a minimum of three lines of evidence, which consists of contacting MISSDIG to clear public utilities, clearing using a hand auger to a depth of 5 feet bgs and using Ground Penetrating Radar (GPR) and/or electromagnetic (EM) techniques to identify private lines.

### 2.3 Mobile Laboratory

Soil and groundwater samples collected during the investigation will be analyzed on-site by the Dakota Technologies (Dakota) mobile laboratory. The Dakota mobile lab uses direct-sampling ion trap mass spectrometry (DSITMS) USEPA Method 8265 to evaluate a select subset of VOCs. Refer to Section 2.5 below for the site-specific list of analytes. The DSITMS method detects VOCs in 2 to 3 minutes per sample and use of the mobile lab enables real-time field decisions to expedite site characterization and limit borings and sampling to just that required to meet the site investigation objectives. Additional details on this validated method can be found on the USEPA website (<https://www.epa.gov/sites/default/files/2015-12/documents/8265.pdf>).

The DSITMS method is applicable to the determination of VOCs in discrete samples and best suited for screening a subset of analytes based on known site conditions. The DSITMS approach cannot distinguish between analytes that exhibit similar mass spectra. As a result, species of dichloroethylene (DCE), including trans-1,2-DCE, cis-1,2-DCE, 1,1-DCE, and 1,2-DCE are reported as a combined concentration (total DCE), and vinyl chloride (VC) is reported as a concentration of VC + 1,2-dichloroethane (1,2-DCA). Due to this limitation approximately 10 percent of the samples will be split and sent to a fixed based laboratory for analysis via USEPA Method 8260. The split sample results will be used as a basis for comparison to the DSITMS results.

## 2.4 Off-Site Vapor Intrusion Assessment

Additional SVMPs and monitoring wells will be located off-site within the City of Pontiac ROW near the residential properties to the southwest of the Site. The additional monitoring points will be used to further assess the potential risk of vapor intrusion to the residential properties. The vapor intrusion investigation will include the following:

- At one location, install a new monitoring well and replace MWOS-09 with a deeper well, both set to straddle the water table (2 wells total). The soil borings will be advanced using direct-push methodology and hollow stem augers. The well will be constructed with 2-inch diameter Schedule-40 PVC materials and a 5-foot, 10-slot stainless steel screen and developed accordingly. The boring will be logged by an Arcadis geologist and field screened with photo-ionization detector (PID).
  - Abandon well MWOS-09. The protective cover will be removed and the monitoring well casing will be cut at 1-foot bgs. The well casing will be back filled with cement-bentonite slurry and buried.
- At two locations, install nested pairs of SVMPs (4 total) targeting just below the silt/clay interbedded unit at the top of the sand unit and just above the seasonably high-water table. Each SVMP will be constructed of a ½" OD 6" stainless steel screen attached to ¼" outer diameter nylon lined tubing that extends to the ground surface. Filter sand material will be installed from the base of the screen to 6" above its top. Dry granular bentonite will be installed 6" above the filter sand. Hydrated bentonite will be installed from the top of the dry bentonite to within 6" of ground surface. Each SVMP will be protected by a 5" steel flush-mount well cover set in a concrete pad at the ground surface.
- Groundwater samples collected from the new monitoring wells will be submitted for laboratory analysis of the site-specific VOCs via USEPA method 8260. Soil vapor samples will be collected from the existing SVMP locations (SV-01-21 and SV-02-21) and the proposed new locations and submitted for laboratory analysis of the site-specific VOCs via USEPA method TO-15.

## 2.5 Vertical Aquifer Profile Investigation

Proposed vertical aquifer profile (VAP) borings will be completed in transects at the southwest property boundary and further upgradient, oriented generally perpendicular to groundwater flow (Figure 2). The VAP transects will be used to identify preferential pathways, and map groundwater mass flux. The location of impacts along the transect will be used to help identify upgradient source areas for further investigation. The proposed VAP investigation would include the following:

- At up to 17 locations, complete soil borings on 50-foot centers to approximately 40 feet bgs or until the basal clay unit is identified. Each soil boring will be logged by an Arcadis geologist and field screened with PID.
- At each of the of the 17 locations, up to three groundwater samples will be collected at nominal 5-foot intervals through the saturated thickness of the sand unit. Additionally, based on the previously observed sand at the Site, at each groundwater sample interval a soil sample will be collected for grain size and hydrometer analysis. The results of the grain-size analysis will be used to estimate hydraulic conductivity using established models (e.g., Hazen, Kozeny-Carmen). Grain-size analysis is a cost-effective way to estimate order of magnitude hydraulic conductivity in coarse grained soils. Previous work completed at the site using the Geoprobe Hydraulic Profiling Tool (HPT) showed that much of the sandy aquifer is beyond the range of direct sensing tools (i.e., HPT range is approximately 0.1-75 feet per day). The grain-size and

hydrometer analysis will be used along with previous studies to better estimate the range of hydraulic conductivity at the Site and used to estimate mass flux/mass discharge at the transects completed across the plume core and at the southwest Site boundary.

- Groundwater samples will be submitted to the Dakota mobile laboratory for analysis of chlorinated volatile organic compounds (cVOCs) including tetrachloroethylene (PCE), trichloroethylene (TCE), 1,1-dichloroethane (1,1-DCA), dichloroethylene (total DCE), and vinyl chloride plus 1,2-dichloroethane (VC+1,2-DCA) via USEPA method 8265. The cVOCs at the Site are the primary driver for off-site VI risk. As noted above, the mobile laboratory is most effective when focused on a limited analyte list and is particularly well suited for cVOC analysis. The mobile lab results will be used to adapt and focus the investigation in real-time. Approximately 10 percent (%) of the samples will be split and sent to a fixed based laboratory for analysis of volatile organic compounds (VOCs) via USEPA Method 8260 to validate the mobile laboratory results. Further, permanent monitoring wells will be installed based on the VAP results and can be sampled for analysis of VOCs via Method 8260.

The mobile laboratory will provide near real-time data to complete the VAP borings adaptively and enable step-ins, step-outs and other adjustments as needed based on the laboratory data. The results of the VAP sampling will help guide identification of upgradient source areas and placement of up to eight (8) permanent monitoring wells, described further below.

## 2.6 Source Characterization

Based on the historical data and downgradient VAP results, potential source areas will be targeted with an adaptive sampling grid. The goal of the adaptive grid will be to evaluate current source mass, source strength and distribution. The proposed source investigation(s) will include the following:

- Depending on the results of the VAP borings up to three areas may be targeted for sampling soils from a grid. Up to 40 borings are included in the scope of work. Soil borings will be completed on an approximate 25 X 25 ft sampling grid, adjusted as necessary, based on the results of the mobile lab, to complete delineation and the other source investigation objectives.
- Each soil boring location will be advanced approximately 25 feet bgs or until the water table is identified. An Arcadis geologist will log each boring and each boring will be field screened with a PID.
- If the VAP groundwater samples or source area soil samples show CVOC concentrations indicative of dense non-aqueous phase liquid (DNAPL) such as TCE or PCE (e.g., groundwater concentration greater than 1% solubility, or soils visually impacted with DNAPL), a soil boring will be advanced to the basal clay unit to evaluate the presence of DNAPL. The deep source area boring will include both saturated soil sampling approximately every 5 feet, and collection of a groundwater sample from the sand unit at the top of the basal clay.
- At each soil boring, soil samples will be collected nominally every 5 feet from the surface to the water table.
- At up to 3 soil boring locations within each adaptive grid (upgradient, center, and downgradient), a groundwater sample will be collected at the water table. If the groundwater concentration is greater than 1% solubility, the soil boring will be advanced to the basal clay unit to evaluate the presence of DNAPL.
- Samples will be submitted to the Dakota mobile laboratory for analysis of PCE, TCE, 1,1-DCA, 1,2-DCE (total), and VC+1,2-DCA via USEPA method 8265. This will allow the investigation within each grid to be adaptive. Approximately 10 % of the samples will be split and sent to a fixed based laboratory for analysis for

VOCs via USEPA Method 8260 to validate mobile laboratory results. In addition, select samples will be submitted to a fixed based laboratory for soil leach testing (SLP) and total organic carbon (TOC).

## 2.7 Monitoring Well Installation and Development

A total of eight monitoring wells will be installed based on the investigation results to confirm the results of the mobile laboratory. Subject to possible access limitations, monitoring wells will be placed near source areas, within the core of the downgradient plume and laterally for sentinel monitoring. Each monitoring well will consist of the following:

- Soil borings will be advanced to approximately 40 feet bgs using direct-push drilling. Soil core samples will be collected continuously for description and documentation of saturated conditions. All soil cores will be logged by an Arcadis geologist and field screened using a PID.
- Monitoring wells will be installed using hollow stem auger drilling techniques and will be constructed with 2-inch diameter Schedule-40 PVC well materials and a 5-foot, 10-slot stainless steel screen. The filter pack sand will be installed approximately 2 feet above the top of the screen followed by a hydrated bentonite chip seal.
- Monitoring wells will be finished with flush mounted well vaults and developed using pumping and surge block methods.
- The horizontal location, ground elevation and the top-of-casing measuring point elevation of each monitoring well will be surveyed by a licensed professional once installed.

## 2.8 Groundwater Sampling

After a minimum of one week after well development, groundwater level measurements and groundwater samples will be collected from the eight proposed new wells, as well as MWF16-23, MWF16-25, MW-06-20, and MW-08-21. During sampling, purge water will be monitored for dissolved oxygen (DO), temperature, specific conductivity, turbidity, oxygen reduction potential (ORP), and pH. Groundwater samples will be collected when parameters stabilize per USEPA low-flow sampling guidance (USEPA 2017) and submitted to Merit Laboratories, Inc. in Lansing, MI for analysis of VOCs using USEPA Method 8260C.

## 2.9 Completion Reporting

A brief technical memo-style report will be prepared to document the activities associated with this SOW. The report will include the following information:

- Brief description of the field activities performed
- Photographic log of activities performed
- Boring and Well Construction logs
- Analytical results
- 3-dimensional (3D) model of the Site

## 2.10 Schedule

Subcontractor procurement for the investigation is in progress. A ROW permit application will be prepared following receipt of USEPA approval of this SOW. The field activities will be implemented as soon as practical after USEPA approval and receipt of the ROW permits, weather permitting, and the majority of field activities are anticipated to be completed within 15 business days. Sampling of the monitoring wells will occur a minimum of one week after their installation. An initial draft of the report is anticipated to be completed within approximately 8 weeks from completion of field activities.

## 3 REFERENCES

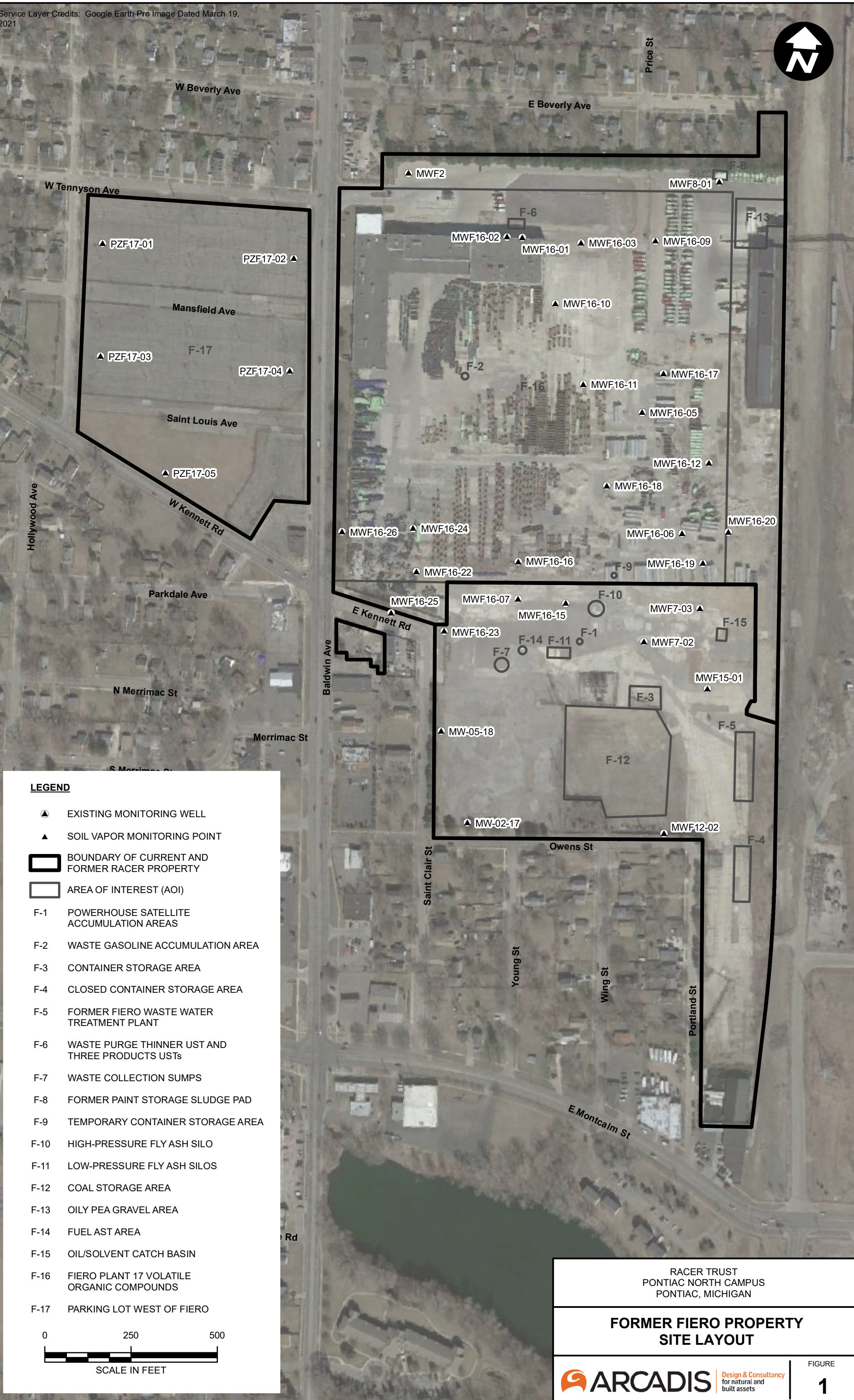
Arcadis, Inc. 2021. DRAFT Conceptual Site Model, Pontiac North Campus Former Fiero Properties, RACER Trust, Pontiac Michigan, August 13, 2021.

USEPA (Region I). 2017. Low-Stress (or Low-Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells – Revision 4. September 19, 2017.

# Figures



CITY: Novi; DIV: ENV; DB: TRY; PIC: PM; TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet; D:\GIS\Project Files\MotorsLiquidation\Company\PontiacNorthCampus\Documents\Former\_Fiero\_Property\02\_FormerPlant17Fieroparcel\_SiteLayout\_202107.mxd PLOTTED: 8/25/2021 10:58:19 AM BY: TYanbrough



**LEGEND**

- ▲ EXISTING MONITORING WELL
- ▲ SOIL VAPOR MONITORING POINT
- ▭ BOUNDARY OF CURRENT AND FORMER RACER PROPERTY
- ▭ AREA OF INTEREST (AOI)
- F-1 POWERHOUSE SATELLITE ACCUMULATION AREAS
- F-2 WASTE GASOLINE ACCUMULATION AREA
- F-3 CONTAINER STORAGE AREA
- F-4 CLOSED CONTAINER STORAGE AREA
- F-5 FORMER FIERO WASTE WATER TREATMENT PLANT
- F-6 WASTE PURGE THINNER UST AND THREE PRODUCTS USTs
- F-7 WASTE COLLECTION SUMPS
- F-8 FORMER PAINT STORAGE SLUDGE PAD
- F-9 TEMPORARY CONTAINER STORAGE AREA
- F-10 HIGH-PRESSURE FLY ASH SILO
- F-11 LOW-PRESSURE FLY ASH SILOS
- F-12 COAL STORAGE AREA
- F-13 OILY PEA GRAVEL AREA
- F-14 FUEL AST AREA
- F-15 OIL/SOLVENT CATCH BASIN
- F-16 FIERO PLANT 17 VOLATILE ORGANIC COMPOUNDS
- F-17 PARKING LOT WEST OF FIERO




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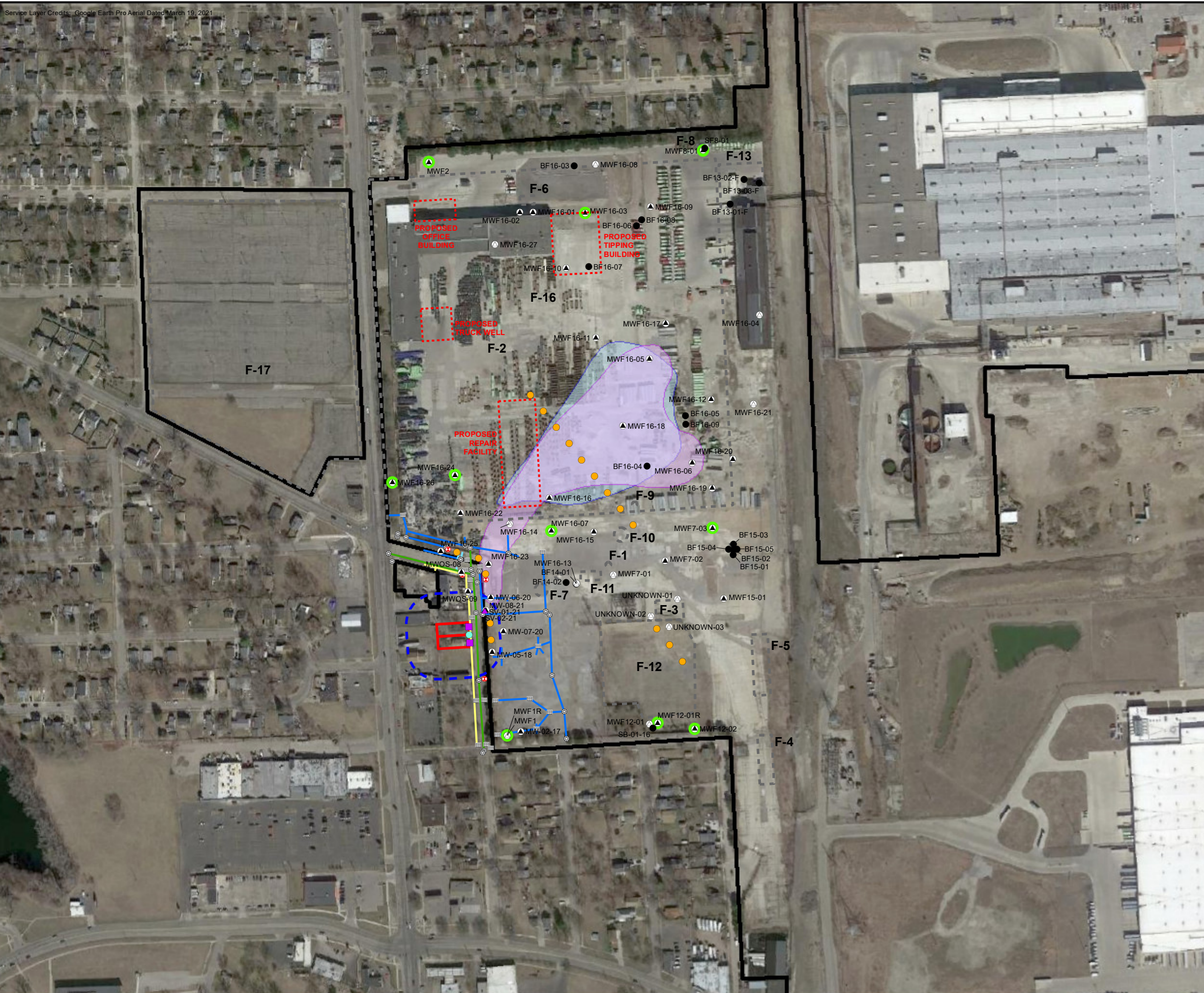
**FORMER FIERO PROPERTY  
SITE LAYOUT**

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Design & Consultancy  
for natural and  
built assets

FIGURE  
**1**



**LEGEND**

- ▲ SOIL VAPOR MONITORING POINT
  - ▲ MONITORING WELL (EXISTING)
  - MONITORING WELL (FORMER)
  - SOIL BORING
  - VOCS LISTED WERE SAMPLED BUT NOT DETECTED IN THIS WELL
  - ▣ CATCH BASIN
  - ⊙ MANHOLE
  - ⊙ FIRE HYDRANT
  - GAS LINE
  - SANITARY
  - STORM SEWER
  - WATER LINE
  - ▭ 100 FT VAPOR INTRUSION BUFFER ZONE
  - ▭ F15 AREA OF INTEREST (AOI)
  - ▭ RESIDENTIAL STRUCTURES WITH FINISHED BASEMENTS
  - ▭ TRICHLOROETHENE CONCENTRATION IN GROUNDWATER (> OR = TO 8.1 µg/L)
  - ▭ TETRACHLOROETHENE CONCENTRATION IN GROUNDWATER (> OR = TO 130 µg/L)
  - ▭ CURRENT OR FORMER RACER PROPERTY
  - ▭ PROPOSED GFL STRUCTURE
- RECOMMENDATIONS**
- PROPOSED VAP BORING
  - PROPOSED MONITORING WELL
  - PROPOSED SOIL VAPOR MONITORING POINT

**NOTES:**

1. UTILITIES ON FIGURE ARE ONLY SHOWN IN VICINITY OF SOUTHWESTERN PROPERTY BOUNDARY.



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**FORMER FIERO DATA GAP RECOMMENDATIONS**

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