# INVESTIGATION WORK PLAN

**FORMER DAVISON ROAD LANDFILL**
**DAVISON AND DONNEGAL ROAD**
**BURTON, MICHIGAN**

Prepared for:

**Michigan Department of Environmental Quality**
**On behalf of:**
**Revitalizing Auto Communities Environmental Response (RACER) Trust**
**2930 Ecorse Road**
**Ypsilanti, MI 48198**

Prepared by:

## Wilcox Professional Services, LLC

**39781 Interchange Drive**
**Farmington Hills, Michigan 48335**
**248-478-3690**

**Wilcox Project No. 10496.00001**

**Prepared March 6, 2012**
**Revised May 22, 2012**

# TABLE OF CONTENTS

# 1.0 Introduction

Wilcox Professional Services, LLC (Wilcox) is pleased to present the following Work Plan for the RACER Trust (RACER) Davison Road Landfill property (herein referred to as the Site) to RACER and the Michigan Department of Environmental Quality (MDEQ). Wilcox has performed a preliminary review of available data and reports provided by RACER which included the *Investigation Work Plan* (IWP) prepared by Arcadis and dated September 30, 2011. In addition, Wilcox personnel visited the site to view current conditions on February 22, 2012. Based on the data review and observed site conditions, the following alternative work plan has been prepared to address perceived gaps in the existing data and existing work plan.

## 1.1 Site Background

The following information is from the IWP prepared by Arcadis:

> *The Site comprises 56 acres of relatively flat and dry land on the southern side of Davison Road near the intersection of Davison Road and Donegal Street. The Site contains vegetation ranging from cultivated grasses to dense scrubby brush and wooded areas, as well as a former automobile test track. Gilkey Creek flows through the Site's southwest corner area. A sanitary sewer traverses the Site along the eastern property boundary. Based on field observations, a possible storm sewer was indentified near the western Site boundary. The Site is located immediately east of the Delphi Energy and Engine Management Systems, Plant 7 in Burton, Michigan.*
>
> *Approximately 21 acres of the Site were used as a permitted landfill in the 1970's for disposal of construction debris, miscellaneous inert solid waste, and foundry sand from the GMC Buick Motor Division facility in Flint, Michigan. The remaining approximately 35 acres of the Site have not been used by GMC since it was acquired in the early 1960s, with the exception of the installation of an asphalt-covered test track. An aerial photograph from 1956 indicates what may have been a grass airstrip to have once been present at the Site.*
>
> *The Site and vacant land to the east were historically associated with the Delphi Energy and Engine Management Systems Flint East Property, Plant 600/700 (MID 908 568 745; the Delphi Facility). In 1995 GMC initiated Resource Conservation and Recovery Act (RCRA) Voluntary Corrective Action at the Delphi Facility with the Michigan Department of Natural Resources. GMC requested at that time that the Site (a portion of the Delphi Facility) not be included in the RCRA Corrective Action program because there have been no historical records of manufacturing or related support activities being conducted on the property. A Preliminary Assessment/Visual Site Inspection was completed at the Delphi Facility in 1992 by PRC Environmental Management, Inc. for United States Environmental Protection Agency (USEPA). Inspection of the Site did not identify any Solid Waste Management Units (SWMU) or Areas of Concern (AOC).*
>
> *The Delphi Facility was owned by GMC until 1999, when Delphi Automotive Systems, LLC, (Delphi) was divested from GMC. Delphi owns the Delphi Facility, while GMC retained the adjacent undeveloped 56-acres property and approximately 144 acres of undeveloped land further east. The 144 acres of undeveloped land was sold by GMC to a third party developer in 2004.*

*Site investigations were performed from 1996 through November 2007, including groundwater and soil assessment, landfill delineation (lateral extent, limited vertical extent), and ecological habitat assessment. These investigations are summarized in Sections 2 and 3 of the Revised Site Investigation Report, 56-Acre Undeveloped Property, Adjacent to Delphi Energy and Engine Management Systems, Plant 600/700, Burton, Michigan (ARCADIS 2008).*

*The analytical results of the soil and groundwater samples from previous investigations indicate the presence of various semi-volatile organic compounds (SVOCs) and/or inorganic constituents at concentrations that exceed MDEQ Part 201 nonresidential generic cleanup criteria for direct contact, drinking water and drinking water protection, groundwater surface water interface, and/or groundwater surface water interface protection.*

## 1.2 Existing Investigative Work Plan

The objective of the Arcadis IWP is to further evaluate groundwater quality at the Site and to determine whether impacted groundwater has migrated off-Site. In addition, near-surface soil sampling is proposed within two areas of the Site where exceedances of Michigan Department of Environmental Quality (MDEQ) Part 201 nonresidential direct contact (NRDC) criteria were detected during previous investigations. The Arcadis IWP is provided as an attachment and is briefly summarized below:

### *Monitoring Well Installation and Groundwater Sampling*

The IWP proposes to install five additional permanent monitoring wells and three piezometers to further evaluate the groundwater flow direction and the extent of impact at the Site. Groundwater samples will be collected from existing wells (MW-1, MW4-04, TW-1, TW-6, TW-8), and from the five newly-installed monitoring wells. Groundwater samples will be analyzed for volatile organic compounds (VOCs), SVOCs, select metals (aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, manganese, vanadium, and zinc) and low level mercury (only from wells adjacent to Gilkey Creek).

A surface water sample will be collected from Gilkey Creek and submitted for analysis of calcium and magnesium to calculate a hardness value. The groundwater sampling and analysis will be performed in accordance with appropriate regulatory methodologies and existing IWP with appropriate Quality Assurance/Quality Control (QA/QC) samples.

### *Near-Surface Soil Sampling*

Near surface and shallow soil samples will be collected in the vicinity of MW4-04SO2. A total of five soil borings will be advanced using a soil probe and nine soil samples will be collected. The soil samples will be submitted for analysis of polynuclear aromatic hydrocarbons (PAHs).

In addition, near surface and shallow soil samples will be collected in the vicinity of FA-17. A total of nine soil borings will be advanced using a soil probe with direct push technology. The borings will be placed in a radial pattern extending 50 feet and 100 feet from the original boring location. A total of 17 soil samples will be collected and analyzed for PAHs. The 100-foot “step out” boring samples will be held by the laboratory, pending the results of the 50-foot “step out”

boring samples. The soil sampling and analysis will be performed in accordance with appropriate regulatory methodologies and existing IWP with appropriate QA/QC samples.

### *Specific Capacity Testing*

Specific capacity testing will be conducted at the newly-installed well locations and select existing well locations to estimate the transmissivity of the saturated zone in the vicinity of these wells. The specific capacity testing will be conducted in accordance with ARCADIS *SOP for Specific Capacity Testing and Data Reduction*.

### *Investigation-Derived Waste Handling*

Soil and water generated from the investigative activities will be placed in 55-gallon drums approved by the Michigan Department of Transportation (MDOT), properly labeled and secured on Site pending disposal. Samples will be collected from the drums for waste characterization. Upon characterization, the drums will be transported and appropriately disposed by a licensed waste hauler. For this scope of work, the soil and groundwater is considered non-hazardous.

### *Reporting*

Following the completion of groundwater investigation activities, a report will be prepared to present findings of the investigation. The report will include an evaluation of groundwater and soil quality results, recommendations for additional monitoring, or sampling, or measures, as necessary, tabulated groundwater and soil sample results, figures, and laboratory analytical reports. Analytical results from the proposed soil and groundwater samples will be compared to the applicable Part 201 cleanup criteria.

# 2.0 Preliminary Site Review

Wilcox has reviewed the data and reports provided by RACER and conducted a site reconnaissance in order to gain a better understanding of site conditions and to best determine the appropriate investigative and remedial actions going forward. As part of this review, we have performed a preliminary analysis of exposure pathways and identified potential data gaps. In addition, we have identified other issues that RACER may need to address to prepare the site for a property transaction and/or redevelopment.

## 2.1 Exposure Pathways

As reported by Arcadis in the Due Care Plan dated July 23, 2008, potential exposure pathways include the following:

- Residential Drinking Water Protection – Soil
- Industrial Drinking Water Protection – Soil
- Residential Drinking Water – Groundwater
- Industrial Drinking Water – Groundwater
- Groundwater/Surface Water Interface Protection – Soil
- Residential Direct Contact – Soil
- Industrial Direct Contact – Soil
- Commercial IV Direct Contact – Soil

Of these potential pathways, all but the soil direct contact pathway was eliminated based on current and future site use, and proposed land use restrictions.

However, the Due Care Plan did not address the groundwater/surface water interface (GSI) pathway. During the Wilcox reconnaissance, a drainage ditch with flowing water was observed along the southern property boundary (and the edge of fill) that flows west into Gilkey Creek. In addition, several rivulets and gullies emanating from the fill area and draining towards Gilkey Creek were noted. GSI exceedances for metals, including mercury, were detected in soil samples collected near these drainageways. Since Gilkey Creek is part of the Flint River drainage basin and therefore considered a “water of the State”, it is Wilcox’s opinion that the GSI pathway needs to be addressed.

## 2.2 Data Gaps

### *GSI Pathway*

As mentioned above, the GSI pathway is applicable. However, there is currently insufficient data to evaluate GSI impact or potential elimination of this pathway. More information is recommended to completely evaluate the GSI pathway

### *Mapping Inaccuracies*

During Wilcox’s site visit, inaccuracies on the available site maps were noted. In particular, Gilkey Creek is shown on the map as within the property fence in the southern portion of the Site, but was observed outside the fence during the site walk. In addition, the aforementioned drainage ditch is not referenced on the site map.

### *Mercury in Groundwater and Surface Water*

Mercury has been detected in several soil samples collected during previous investigations, but not in groundwater or surface water samples during these investigations. It does not appear that these samples were analyzed using USEPA Method 1631 which has a lower detection level for mercury. It is recommended that future groundwater and/or surface water sampling events include low-level mercury analysis.

### *Extent of Fill*

During Wilcox's site visit an obvious bank or berm was observed that could be indicative of the edge of fill, but the bank did not coincide with the extent of fill depicted in the available figures. In order to better understand the total area of fill to be addressed, the extent of fill along the floodplain of the Gilkey Creek needs to be defined.

## 2.3 Project Objectives

Wilcox' objective of this project is to remediate the impacted media, as needed and as appropriate, to be consistent with the eventual land use of the Site. The overall purpose of the alternative investigation is to determine the nature and extent of contamination at the Site for the ultimate goal of closure. The purpose of this investigation is to:

- Address the aforementioned data gaps;
- Define groundwater flow parameters, including direction and rate;
- Further define soil contamination;
- Further define extent of groundwater contamination;
- Evaluate exposure pathways; and
- Recommend appropriate remedial actions, if necessary.

The investigation as proposed herein will include a limited number of soil borings and shallow monitoring wells located at various locations throughout the Site, as well as additional activities to aid in determining the ultimate disposition of the Site.

.

# 3.0 Proposed Scope of Work

## 3.1 Task 4 – Groundwater Investigation

### *Subtask 00 – Project Management*

***File Review***

Some of the data gaps described above were identified during Wilcox's preliminary file review. A thorough review of readily available reports and data may reveal information not found during the initial review. Therefore, Wilcox will perform a detailed examination of readily available information.

***Health and Safety Plan***

Wilcox will prepare a site-specific Health and Safety Plan to address the known and potential presence of contaminants in proposed work areas. The plan will include identification of known and suspected contaminants, exposure pathways and general safety precautions that should be taken to avoid or minimize the risk of injury or exposure to contaminants. During work in impacted areas, Wilcox will provide personnel that have completed appropriate HAZWOPER training to observe work, screen for potential contaminants and unsafe environmental conditions and document the handling and disposition of contaminated materials. Field analysis will be performed using visual observation, photoionization detector (PID) and/or tri-gas meters.

### *Subtask 01 – Initial Field Investigation*

***Topographic/Boundary Survey***

A comprehensive boundary and topographic survey of the site is proposed. The resulting survey drawing is necessary and useful in serving as a base diagram to depict pertinent sample locations and features, including historic fill limits, areas below the 100-year flood elevation of Gilkey Creek, wetlands, monitoring wells, etc. In addition, it would be required to appropriately design a land balancing/capping plan and develop a scope of work and/or cost opinion for any mass land balancing, filling or grading that may be required.

Wilcox recommends a topographic survey be performed using aerial techniques supplemented with ground control and survey to collect specific information regarding surface water drainage features (stream bottom elevations, culvert inverts, etc.) and verification of existing tops of well casings. The final product would be a detailed survey of the site at a scale of 1" = 100' with contours depicted at 2' intervals. The data would include a black and white, digital photograph that can be superimposed upon the survey drawing. In preparing the survey, we will rely on property descriptions and boundary surveys completed by others to depict the approximate location of the property boundaries on the topographic survey.

As the aerial flight cannot be scheduled until the Fall of 2012, it will not be feasible to use aerial techniques in the short-term and ground survey techniques will be required in the interim.

***Soil Borings/Soil Sampling***

A total of 28 soil borings will be installed to define the vertical and horizontal extent of known soil contamination and to further evaluate potential open exposure pathways. Ten of the soil borings will be advanced in the area between the known fill and Gilkey Creek and in the area along the southern drainage ditch to evaluate the GSI protection pathway. Fourteen soil borings will be advanced in areas of previously identified contamination to define the horizontal and vertical extent of impact. The remaining four soil borings will be advanced to characterize soil conditions on the northern, central, and east-central portions of the site. Proposed soil boring locations are depicted on the attached figure.

The sol borings will be advanced utilizing a soil probe, to a total depth of approximately 15 feet (ft) below ground surface (bgs) or five ft below the water table surface, whichever is deeper. A 4-ft macrosampler will be driven to the target depth, collecting continuous soil cores.

During drilling, the soil will be described in general accordance with the Unified Soil Classification System to include color, grain size, predominant soil types, odor, moisture, and visual contaminant impact. A PID will be used to monitor the volatile organic vapor content in the soil. Soil description, PID readings, and other pertinent observations including any visual evidence of contamination (e.g., staining, odor, sheen, etc.) will be recorded in a field log book.

Discrete soil samples will be collected at the interval exhibiting the highest PID readings or noticeable physical impact. If the soil samples do not exhibit elevated PID readings or physical impact, then the sample will be obtained from the interval above the water table surface. Up to two samples will be collected from each boring location.

The 14 soil samples collected from the areas of known contamination will be submitted for analysis of for VOCs, PAHs and selected metals (aluminum, arsenic, cadmium, chromium, cobalt, copper, mercury, iron, manganese, vanadium, and zinc). The remaining 14 samples will be analyzed for VOCs, SVOCs, and the selected metals. Soil sampling and analysis will be performed according to appropriate regulatory methodologies and in accordance with the IWP, with appropriate QA/QC samples.

The drilling equipment will be decontaminated prior to drilling each boring. The sampling equipment will be cleaned prior to sample collection with a solution of non-phosphate soap and control water followed by a control water rinse.

***Monitoring Wells/Groundwater Sampling and Evaluation***

Fourteen of the 28 soil borings will be converted into monitoring wells to aid in the determination of groundwater flow parameters and groundwater quality. Ten of the monitoring wells will be installed in the area between the known fill and Gilkey Creek and in the area along the southern drainage ditch to evaluate the GSI pathway and to determine the hydrogeologic influence of the drainage ditch. The remaining four monitoring wells will be installed in the areas on the northern, central, and east-central portions of the site.

These newly installed wells will further assist in the characterization of the groundwater. The depth of each monitoring well will be determined based on field observation during drilling. However, it is anticipated that the wells will be completed no deeper than 15 ft bgs. The monitoring wells will be installed such that the well screen interval intersects the water table surface at the time of drilling. Proposed monitoring well locations are depicted on the attached figure.

The wells will be constructed of two-inch diameter, Schedule 40, polyvinyl chloride (PVC) casing coupled to a 10-ft long PVC well screen. The monitoring wells will be completed as follows:

- A sand filter pack will extend from the bottom elevation of the well screen to approximately two ft above the top elevation of the well screen interval.
- Bentonite chips will be placed in the annular space above the sand pack and extend to approximately 3 ft bgs. The chips will be hydrated and the remainder of the annulus will be backfilled with auger cuttings.
- The wells will be secured at the surface with an expandable well cap and a steel locking protective cover cemented in place. The wells will be completed above grade.

After installation, the monitoring wells will be developed to establish good communication between the aquifer material and the well screen interval. The entire well screen interval will be developed using the "surge and purge" method through use of a submersible pump. The development will be considered complete when the evacuated water is relatively free of sediment.

After installation, groundwater samples will be collected from each well. Prior to groundwater sampling, depth-to-groundwater measurements will be collected with an electronic water level meter. A total of 19 groundwater sample will be collected from the new (14) and existing (5) monitoring wells using a peristaltic or bladder pump equipped with disposable tubing to prevent cross-contamination.

Samples will be collected using the low-flow sampling method. Water quality parameters including pH, specific conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity will be recorded during purging. Readings must stabilize within 10% prior to sample collection. If the turbidity reading is greater than 20 Nephelometric Turbidity Units, the groundwater sample will be filtered using a 0.45-micron disposable filter and analyzed for dissolved metals in addition to total metals.

Groundwater samples will be analyzed for VOCs, SVOCs, select metals (aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, manganese, vanadium, and zinc) and low-level mercury. Groundwater sampling and analysis will be performed according to appropriate regulatory methodologies and in accordance with the IWP, with appropriate QA/QC samples.

Five of the wells will be selected for hydrogeologic testing in order to further evaluate groundwater flow parameters, such as hydraulic conductivity and rate of flow. Slug tests, or bail-down tests will be performed at each of the selected locations. The test results will be analyzed according to the Bouwer and Rice (1976) method for unconfined aquifers, which provides a relatively easy and accurate method to determine hydraulic conductivity of an aquifer in a near wellbore environment. This data, along with other soil and groundwater parameters will be utilized to calculate groundwater flow rate and direction.

***Surface Water sampling***

Surface water samples will be collected from Gilkey Creek, wetlands, and the unnamed drainage ditch along the southern property boundary, at locations upstream, between, and downstream of the Site (six locations total). The surface water samples will be analyzed for VOCs, SVOCs, select metals (aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, manganese, vanadium, and zinc) and low-level mercury. Surface water sampling and analysis

will be performed according to appropriate regulatory methodologies and in accordance with the IWP, with appropriate QA/QC samples.

***Investigation-Derived Waste Handling***

Soil and water generated from the investigative activities will be placed in 55-gallon drums approved by the Michigan Department of Transportation (MDOT), properly labeled and secured on Site pending disposal. Samples will be collected from the drums for waste characterization. Upon characterization, the drums will be transported and appropriately disposed by a licensed waste hauler. For this scope of work, the soil and groundwater is considered non-hazardous.

## *Subtask 02 – Delineation Field Investigation*

***Fill Delineation***

The proposed topographic survey should provide a relatively accurate illustration of fill boundaries, based on observed topographic anomalies. Wilcox will attempt to confirm the fill boundary utilizing a hand probe at various locations along the topographic boundary. Material will be extracted using the hand probe and examined to determine content and whether it is indicative of fill and/or native material. The fill boundary will be staked and geo-coded using a hand-held GPS unit.

## *Subtask 03 – Report Preparation*

***Investigation Report***

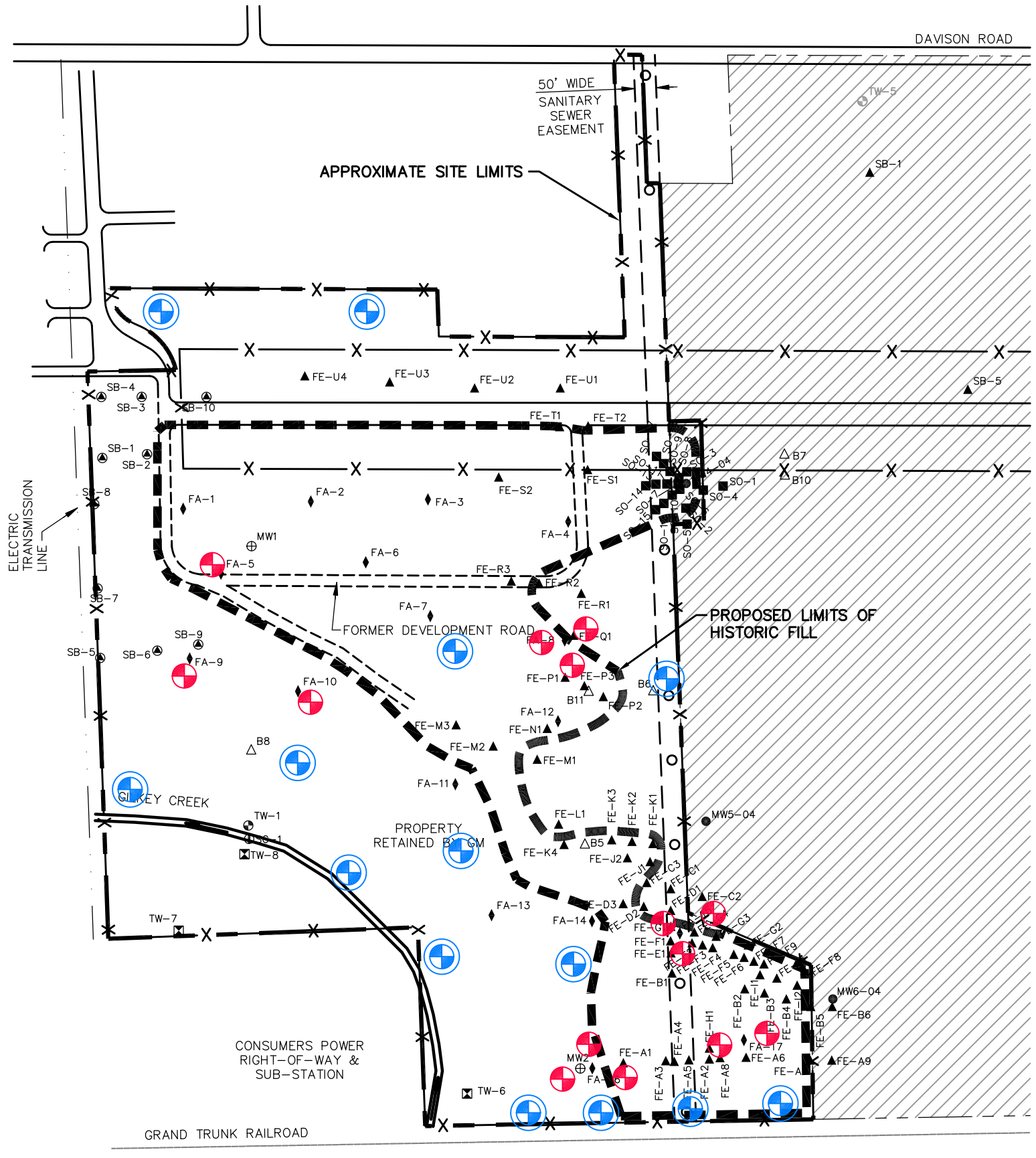
Upon completion of the investigative activities and the data analysis and pathway evaluation, Wilcox will prepare an executive summary style report to present the findings. Relevant potential contaminant exposure pathways will be re-evaluated based on the current investigation results. In particular, it may be possible to compare concentrations of the constituents of concern to default background values, which may eliminate certain pathways. In addition, new information on the geologic and hydrogeologic conditions may aid in defining or eliminating pathways.

Analytical results from the proposed soil and groundwater samples will be compared to the applicable Part 201 cleanup criteria to determine the extent of contamination. Where appropriate, site-specific risk-based cleanup criteria may be developed.

The report will include sample results, geologic cross-sections, data evaluation, a groundwater contour map and proposed follow-up activities, if any. The report will include a brief introduction and background, a summary of the work completed, any variations from the approved Work Plan, a summary of data validation, comparison to applicable MDEQ Part 201 criteria, data tables, and drawings (data boxes, contours, etc.), as appropriate to clearly illustrate the results. The report will also include recommendations for additional investigation, if necessary, or recommendations for remedial actions, if appropriate.

Wilcox will present the findings and provide the report to MDEQ.

(1117TB – 08-06-09)




0 150 300

( IN FEET )
1 inch = 300 ft.

## LEGEND

- PROPERTY SOLD TO A THIRD PARTY
- PROPERTY RETAINED BY GM
- APPROXIMATE EXTENT OF FILL AREA
- FORMER PROPERTY BOUNDARY
- EXISTING ROAD
- RAILROAD
- FENCE
- ELECTRIC TRANSMISSION LINE
- CREEK
- DIRECTION OF CREEK FLOW
- SANITARY SEWER MANHOLE
- SANITARY SEWER EASEMENT
- MW1 ⊕ HISTORICAL OBSERVATION WELL (5/96)
- MW4 ⊕ ABANDONED HISTORICAL OBSERVATION WELL
- B1 △ HISTORICAL SOIL BORING (5/96)
- TW-1 ◔ TEMPORARY MONITORING WELL (12/03)
- TW-2 ◔ ABANDONED TEMPORARY MONITORING WELL
- SB-4 ▲ SOIL BORING (12/03)
- FA-1 ♦ SOIL BORING (3/04)
- MW4-04 ● TEMPORARY MONITORING WELL (4/04)
- SO-1 ■ SOIL BORING (5/04)
- TW-6 ⊠ TEMPORARY MONITORING WELL (8/07)
- ◐ STAFF GAUGE LOCATION
- SB-6 ◭ SOIL BORING (8/07)
- PROPOSED SOIL BORING
- PROPOSED SOIL BORING / MONITORING WELL

NOTE: BASE DIAGRAM PROVIDED BY RACER AND PREPARED BY ARCADIS.

| | |
|---|---|
| FILE: sb-mw location | PROJECT LOG |
| PROJECT MGR: BH | |
| DESIGNED BY: | |
| DRAWN BY: KB | |
| CHECKED BY: | |
| SCALE: 1"=300' | |
| SHEET: 1 OF 1 | |

**DAVISON ROAD**
**INDUSTRIAL PROPERTY**
**BURTON, MICHIGAN**

**THE RACER TRUST**
**2930 Ecorse Road**
**Ypsilati, Michigan 48198**

**PROPOSED SOIL BORING / MW LOCATION DIAGRAM**


Wilcox Professional Services
5859 Sherman Road
Saginaw, MI 48604
989-752-6500
Fax: 989-752-6600
www.wilcox.us


10496.00004