



22016072264

Baseline Environmental Assessment Submittal Form

This form is for submittal of a Baseline Environmental Assessment (BEA), as defined by Part 201, Environmental Remediation and Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, for the purpose of establishing an exemption to liability pursuant to Section 20126(1)(c) and Section 21323a(1)(b) for a new owner or operator of property that is a facility as defined by Section 20101(1)(s) or Property as defined by Section 21303(d). The BEA report must be conducted either prior to or within 45 days after becoming the owner or operator, whichever is earliest. This form and the BEA report must be submitted prior to or within 6 months of becoming the owner or operator whichever is earliest. A separate BEA is required for each legal entity that is or will be a new owner or operator of the property. To maintain the exemption to liability, the owner and operator must also disclose the BEA to any subsequent purchaser or transferee before conveying interest in the property pursuant to Section 20126(1)(c) and Section 21323a(1)(b). An owner or operator of a facility or Property also has due care obligations under Section 20107a and Section 21304c with respect to any existing contamination to prevent unacceptable exposure; prevent exacerbation; take reasonable precautions; provide reasonable cooperation, assistance, and access to authorized persons taking response activities at the property; comply with land use restrictions associated with response activities; and not impede the effectiveness of response activities implemented at the property. Documentation of due care evaluations and conducted response activities need to be available, but not submitted, to the MDEQ within 8 months of becoming the owner or operator of a facility and/or Property.

Section A: Legal Entity Information

Name of legal entity that does or will own or operate the property: Pincrest Holdings, LLC Address: 47 Oxford Road City: Grosse Pointe State: MI Zip: 48236 Contact person (Name & Title): Greg Cooksey - Authorized Representative Telephone: 313-378-1446 E-Mail: GCOOKSEY@CGEMERSON.COM	Contact for BEA questions if different from submitter Name & Title: Mr. Jamie Antoniewicz, PE – Project Engineer Company: PM Environmental, Inc. Address: 4080 West Eleven Mile Road City: Berkley State: MI Zip: 48072 Telephone: 248.336.9988 E-Mail: ANTONIEWICZ@PMENV.COM
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Section B: Property Information

Street Address of Property: 1600 West Eight Mile Road City: Ferndale State: MI Zip: 48220 Property Tax ID (include all applicable IDs): 25-33-451-003; 25-33-451-005 Address according to tax records, if different than above (include all applicable addresses): City: State: Zip: Status of submitter relative to the property (check all that apply): Owner Former <input type="checkbox"/> Current <input checked="" type="checkbox"/> Prospective <input type="checkbox"/> Operator Former <input type="checkbox"/> Current <input type="checkbox"/> Prospective <input type="checkbox"/>	County: Oakland City/Village/Township: Ferndale Town: 1N Range: 11E Section: 33 Quarter: SE Quarter-Quarter: SW/NW Decimal Degrees Latitude: 42.4480 Decimal Degrees Longitude: -83.1490 Reference point for latitude and longitude: Center of site <input checked="" type="checkbox"/> Main/front door <input type="checkbox"/> Front gate/main entrance <input type="checkbox"/> Other <input type="checkbox"/> Collection method: Survey <input type="checkbox"/> GPS <input type="checkbox"/> Interpolation <input checked="" type="checkbox"/>
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Section C: Source of contamination at the property (check all that are known to apply):

Facility regulated pursuant to Part 201, other source, or source unknown Part 201 Site ID, if known:	<input checked="" type="checkbox"/>
Property - Leaking Underground Storage Tank regulated pursuant to Part 213 Part 211/213 Facility ID, if known:	<input type="checkbox"/>
Oil or gas production and development regulated pursuant to Part 615 or 625	<input type="checkbox"/>
Licensed landfill regulated pursuant to Part 115	<input type="checkbox"/>
Licensed hazardous waste treatment, storage, or disposal facility regulated pursuant to Part 111	<input type="checkbox"/>

Section D: Applicable Dates (provide date for all that are relevant):

MM/DD/YYYY

Date All Appropriate Inquiry (AAI) Report or Phase I Environmental Assessment Report completed:	06/16/2016
Date Baseline Environmental Assessment Report conducted:	06/17/2016
Date submitter first became the owner:	05/04/2016
Date submitter first became the operator (if prior to ownership):	
Anticipated date of becoming the owner for prospective owners:	
Anticipated date of becoming the operator for prospective operators:	
If former owner or operator of this property, prior dates of being the owner or operator:	

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Section E: Check the appropriate response to each of the following questions:

YES NO

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|
| 1. Is the property at which the BEA was conducted a "facility" as defined by Section 20101(1)(s) or a Property as defined by Section 21303(d)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Was the All Appropriate Inquiry (AAI) completed in accordance with Section 20101(1)(f) and or 21302(1)(b)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Was the BEA, including the sampling, conducted either prior to or within 45 days of the date of becoming the owner, operator, or of foreclosure, whichever is earliest? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Is this BEA being submitted to the department within 6 months of the submitter first becoming the owner or operator, or foreclosing? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Does the BEA provide sufficient rationale to demonstrate that the data is reliable and relevant to define conditions at the property at the time of purchase, occupancy, or foreclosure, even if the BEA relies on studies of data prepared by others or conducted for other purposes? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Does this BEA contain the legal description of the property addressed by the BEA? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Does this BEA contain the environmental analytical results, a scaled map showing the sample locations, and the basis for the determination that the property is a facility as defined by Section 20101(1)(s) or the basis for the determination that the property is a Property as defined by Section 21303(d)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Section F: Environmental Consultant Signature:

I certify to the best of my knowledge and belief, that this BEA and all related materials are true, accurate, and complete. I certify that the property is a facility as defined by Section 20101(1)(s) or a Property as defined by Section 21303(d) and have provided the sampling and analyses that support that determination. I certify that any exceptions to, or deletions from, the All Appropriate Inquiry Rule are described in Section 1 of the BEA report.

Signature:  Date: 8/12/2016

Printed Name: Jamie Antoniewicz

Company: PM Environmental, Inc.

Mailing Address: 4080 West Eleven Mile Road

City: Berkley

State: MI


Zip: 48072

Telephone: 248.336.9988

E-Mail: ANTONIEWICZ@PMENV.COM

Section G: Legal Entity Signature:

With my signature below, I certify that to the best of my knowledge and belief, this BEA and all related materials are true, accurate, and complete.

Signature:  Date: 8/11/16
(Person legally authorized to bind the legal entity)

Printed Name: Greg Cooksey

Title and Relationship of signatory to submitter: Authorized representative of ownership entity

Address: 47 Oxford Road

City: Grosse Pointe

State: MI

Zip: 48236

Telephone: 313-378-1446

E-Mail: GCOOKSEY@CGEMERSON.COM

Submit the BEA report and this form to the MDEQ District Office for the county in which the property is located.
A office map is located at www.michigan.gov/degrrd.

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BASELINE ENVIRONMENTAL ASSESSMENT

1600 West 8 Mile Road | Ferndale, Michigan
PM Project Number 01-6124-1-0001

Prepared for:

Pinecrest Holdings, LLC
47 Oxford Road
Grosse Pointe, Michigan 48236

Prepared by:

PM Environmental, Inc.
4080 West 11 Mile Road
Berkley, Michigan 48072

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June 17, 2016

District Supervisor
Michigan Department of Environmental Quality
Southeast Michigan District Office
27700 Donald Court
Warren, Michigan 48092

**RE: Baseline Environmental Assessment for the
Former Ethyl Corp Property Located at
1600 West Eight Mile Road, Ferndale, Michigan
Parcel ID: 25-33-451-003 and 25-33-451-005
PM Environmental, Inc. Project No. 01-6124-1-0001**

Dear District Supervisor:

Enclosed is a copy of the Baseline Environmental Assessment prepared for the above referenced subject property in accordance with Section 20126(1)(c) of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994 (Part 201), as amended.

If you have any questions regarding the information in this report, please contact us at 800-313-2966.

Sincerely,
PM ENVIRONMENTAL, INC.

Jamie Antoniewicz, P.E.
Project Engineer

J. Adam Patton, CHMM
Manager of Site Investigation Services

Enclosure



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June 17, 2016

Mr. Greg Cooksey
Pinecrest Holdings, LLC
47 Oxford Road
Grosse Pointe, Michigan 48236

**RE: Baseline Environmental Assessment for the
Former Ethyl Corp Property Located at
1600 West Eight Mile Road, Ferndale, Michigan
Parcel ID: 25-33-451-003 and 25-33-451-005
PM Environmental, Inc. Project No. 01-6124-1-0001**

Dear Mr. Cooksey:

Enclosed is a copy of the above-referenced document prepared in accordance with Section 20126(1)(c) of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994 (Part 201), as amended.

THIS BASELINE ENVIRONMENTAL ASSESSMENT WAS PERFORMED FOR THE EXCLUSIVE USE OF PINECREST HOLDINGS, LLC, WHO MAY RELY ON THE REPORT'S CONTENTS.

If you have any questions regarding the information in this report, please contact our office at 800-313-2966.

Sincerely,
PM ENVIRONMENTAL, INC.

Jamie Antoniewicz, P.E.
Project Engineer

J. Adam Patton, CHMM
Manager of Site Investigation Services

Enclosure

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1.0 INTRODUCTION AND DISCUSSION

PM Environmental, Inc. (PM) completed a Baseline Environmental Assessment (BEA) for the former Ethyl Corp property (Parcel ID: 25-33-451-003 and 25-33-451-005) located at 1600 West Eight Mile Road, Ferndale, Oakland County, Michigan 48220 (hereafter referred to as the "subject property"; Figure 1). The subject property consists of two parcels totaling 33.93 acres. The property is located northeast of the intersection of West Eight Mile Road and Pinecrest Drive in Ferndale, Michigan. The property generally consists of vacant land with the exception of a guard shack and paved parking areas and roads related to the former buildings. The entire property that was formerly developed is fenced and secured preventing site access.

Standard and other historical sources documented that the subject property was developed as a research and development facility for chemical additives for gasoline in 1937 with buildings constructed at various times between the 1930s and 1980s. All of the buildings were demolished, except the guard house (Building Q) after 1970, with the majority of the buildings demolished between 2012 and 2013. Historical operations include the research and development facility from the 1930s until the 1980s, followed by manufacturing operations from the 1980s until vacated in 2012 to 2013.

1.1 Owner/Operator Information

Pinecrest Holdings, LLC, 47 Oxford Road, Grosse Pointe, Michigan 48236, purchased the property on May 4, 2016.

1.2 Intended Use of the Subject Property

Pinecrest Holdings, LLC intends to redevelop the property with Residential use on the northern portion and commercial use on the southern portion.

1.3 Summary of All Appropriate Inquiry Phase I Environmental Assessment

PM completed a Phase I Environmental Site Assessment (ESA) update, dated June 16, 2016, in conformance with the scope and limitations of ASTM Practice E 1527-13 (i.e., the 'ASTM Standard'). A copy of the June 2016 Phase I ESA update, including photographs of the subject property, is included in Appendix A.

The following recognized environmental condition (REC) was identified in PM's June 2016 Phase I ESA update:

- The subject property was occupied by a research and development facility for chemical additives for gasoline from the 1930s until the 1980s, followed by manufacturing operations from the 1980s until vacated in 2012. Based upon review of the previous subsurface investigations, soil and groundwater contamination is present which exceeds the current Part 201 Residential and Nonresidential cleanup criteria. Based on these analytical results, the subject property would be classified as a "facility," as defined by Part 201 of P.A. 451 of the Michigan Natural Resources Environmental Protection Act (NREPA), as amended.
- Review of available information documents that laboratory wastes, residues, glassware, foundry sands, and containers were buried in the northern, central, and eastern portions of the subject property. The previous site investigations were not adequate to assess

these former disposal areas. Review of Health Department records documents that 11 disposal pits were located in the vicinity of former Building AE (located in the northwestern portion of the property), the majority of which were located east of the building. Unmapped disposal areas were also reported to be present north of former Building AI and in the vicinity of the eastern parking lot from the 1930s through the 1980s. Additionally, review of aerial photographs document ground disturbance throughout the northern and/or central portion of the subject property during the 1930s through the 1970s. The previous site investigations were limited to two small areas north and northeast of former Building AE and in the vicinity of the eastern parking area. Contamination has been identified above Part 201 cleanup criteria in the assessed portions of the disposal areas. Additionally, based on the operations of the site and the information provided, the potential exists for drums or potential explosive or reactive materials to have been buried. Based on this information, the potential exists for additional contamination and/or potentially hazardous materials may be present below the subsurface.

- The subject property formerly contained at least 78 underground storage tanks (USTs). The majority of the USTs were located within three UST farms, located west of former Building R, west of former Building B, and north of former Building H (in between former Buildings B and C). Additional USTs were located north of former Building D, south of former Building AE, and in the vicinity of former Buildings O, M, E, and F. The previous site investigations were not adequate to assess the USTs, with the exception of the two former 15,000-gallon gasoline/diesel USTs which were located west of former Building C and the 1,000-gallon fuel oil UST located south of former Building AE. Free product (i.e. non-aqueous phase liquid (NAPL)) was found in a monitoring well located in the vicinity of the former 10,000-gallon heating oil USTs located in the vicinity of former Building D. One soil sample was collected west of former Building B to assess eight former USTs and gasoline dispensing operations; no soil and/or groundwater samples were collected to assess the USTs which were located in the central portion of the property including the UST farm formerly located west of former Building R; 54 USTs were located north of former Building H; however, only a few soil and groundwater samples were collected in this area. Based on the long time period of operations and the number of USTs identified, the potential exists for additional USTs to be present. Records reviewed document that heating oil USTs were not registered and/or thoroughly documented. Additionally, USTs outside of the three main UST farms were not well documented as to the location. The previous site investigations did not include ground penetrating radar (GPR) survey. Based on this information, the potential exists for additional contamination and/or for orphan USTs to be present.
- Historical operations included blending of fuels, foundry operations, service operations, maintenance operations, chemical storage, incinerator, and laboratory testing from the 1930s until the 1980s followed by manufacturing operations. The previous site investigations were not adequate to assess the historical operations. No soil and/or groundwater sampling was conducted within the building footprints, former chemical storage areas, oil sumps, foundry operations, machine shop operations, fuel blending operations, service garage, and maintenance operations were also not adequately assessed. Therefore, the potential exists for additional contamination to be present.

The following adjoining and/or nearby RECs were identified:

- Ground disturbance was observed on the north adjoining property, identified as 881 Pinecrest Drive, during the 1940s and 1950s, which may have been part of the subject property disposal practices. Contamination has been identified with the disposal operations that occurred on the subject property during this time period. Therefore, the potential exists for contamination to be present and to be migrating onto the subject property.
- The west adjoining property, identified as 2000 West Eight Mile Road, is a BEA site. Review of available Michigan Department of Environmental Quality (MDEQ) records documents that one soil boring was advanced on the property in the northeastern parking area. Low levels of polynuclear aromatic compounds (PNAs) were detected in the soil. The property was historically occupied by printing operations from the 1950s until the 2000s. Printing operations generally consist of the use of hazardous substances and/or petroleum based products. Based on the relative close proximity (within 50 feet) and the groundwater flow direction towards the property, the potential exists for a release to have occurred on this property and to have migrated onto the subject property.

1.3.1 Phase I ESA Exceptions or Deletions

There were no exceptions or deletions from the Federal All Appropriate Inquiry Rule under 40 CFR 312, or the ASTM Standard during the completion of PM's June 2016 Phase I ESA and no special terms or conditions applied to the preparation of the Phase I ESA.

1.3.2 Phase I ESA Data Gaps

PM did not identify any significant data gaps during the completion of the June 2016 Phase I ESA.

1.4 Summary of Previous Subsurface Site Investigations

PM reviewed the following previous environmental reports for the subject property. Relevant portions of the reports are included in Appendix A.

Name of Report	Date of Report	Company that Prepared Report
Health Department Correspondence	1985-1986	Between Ethyl Corporation and Oakland County Health Division
Leaking Underground Storage Tank (LUST) Closure Report	4-3-1997	Swanson Environmental
Phase I ESA	11-27-2012	RJN Environmental (RJN)
BEA	12-2-2012	RJN Environmental
Phase II ESA	12-18-2012	RJN Environmental
Phase II ESA	11-1-2013	RJN Environmental
Phase I ESA	11-3-2015	PM

Health Department records document that Ethyl Corporation had offered to gift the subject property to Oakland County. The County Health Department performed an initial assessment of the property which included review of available information and a limited environmental study. The areas of concern identified were the former disposal areas and former UST basins. A magnetometer survey was completed on a 50 foot grid in portions of the northern, eastern, and central portions where dumping had reportedly occurred. Anomalies were detected. Limited groundwater samples were collected in the vicinity of former Building AE (located on the northwestern portion of the property). Toluene, tetrahydrofuran, and chloroform were detected in the groundwater; however, the results provided were estimations based on chromatography. The final results were not provided and additional work was not completed because Oakland County determined not to accept the property.

The subject property is a closed LUST site with one release reported in 1996 and unrestricted Tier I LUST closure granted in 1998. The release was associated with the former 15,000-gallon diesel/gasoline USTs installed in 1988. Approximately 90 cubic yards of soil was removed from the property. Methyl-tert-butyl-ether (MTBE); 1,2,4-trimethylbenzene (TMB); ethylbenzene; and ethylbenzene were detected in soil and/or groundwater above MDEQ Part 213 Drinking Water (DW); Drinking Water Protection (DWP); Groundwater Surface Water Interface (GSI); and/or Groundwater Surface Water Interface Protection (GSIP) Risk Based Screening Levels (RBSLs).

A Phase I ESA was performed in 2012. At the time of the Phase I ESA the property was vacant; however, the majority of the buildings were present. The Phase I ESA summarized the previous site investigations, including some that were not received by PM during the time constraints of this report, that were completed between 1986 and 1998. According to the Phase I ESA, test pits were completed in 1986 in the vicinity of the magnetometer survey readings. No buried drums were reportedly encountered; however, fill material consisting of bricks, concrete, and asphalt was observed in these areas. Soil gas samples were also reportedly collected in 1986 in the former UST area; however, results and location of the samples was not provided.

The 2012 Phase I ESA documented that a release of fuel oil was observed during the removal of the two 10,000-gallon fuel oil USTs. Approximately 240 cubic yards of soil were removed at that time; however, contaminated soil remained in place due to the location of the building and utilities. During subsequent investigations to delineate the fuel oil plume, fuel oil was discovered in one of the monitoring wells. A 1,000-gallon heating oil additive UST was found and removed in 1995, which was located south of the 10,000-gallon fuel oil USTs and was believed to be the source of the fuel oil in the groundwater wells. The 2012 Phase I ESA documents that the previous site investigations indicated volatile organic compounds (VOCs) were detected in the drinking water and soils of the subject property; however, no analytical results were provided. The Phase I ESA identified RECs which are summarized below.

- The subject property was historically occupied by Ethyl Corporation. Operations included the use of emissions laboratory, engine research, fuel blending, maintenance shops, and bulk chemical storage. These operations generally use hazardous substances and/or petroleum based products. The detail of the general storage, use and disposal of these chemicals is unknown.
- The subject property is listed as a former UST site, a closed LUST site, a former Hazardous Waste Site, a Resource Recovery and Conservations Act (RCRA)-Conditionally Exempt Small Quantity Generator (CESQG), a RCRA Corrective Action Site (CORRACTS), and a CERC-No Further Action Planned (NFRAP).

- There are three historical disposal areas identified on the subject property, located near the former building AE, north of former Buildings AB and AF, and the northern portion of the eastern parking area. The disposal areas were used to dispose of laboratory wastes including glassware and residues as well as reactive sodium compounds at various times between the 1930s and 1980s.
- Historical groundwater investigations have identified VOCs. The source of this plume has been reported to have been from the historical disposal pit located northwest of the former Building AE.
- Historical reports identified 72 USTs formerly located on the subject property. The bulk of the USTs were located in a tank farm located between the former Buildings B and C. Additionally, a single heating oil UST was located north of Building D and south of Building AE. A review of government records indicates the USTs have been removed. A release was reported in 1996 associated with the removal of a former gasoline UST, which was granted closure in 1998. The Closure report was not available. Due to lack of confirmation sampling data, the USTs have been identified as a REC.
- Former Building H was used for fuel blending and piped to Building C for engine testing. There was also a remote fill station west of Building B. The former piping areas is considered a REC.
- Review of historical reports documents releases of fuel oil from a former UST located north of Building D. Free product (i.e. NAPL) was recovered. Contamination reportedly remains.
- Historical reports document chemical storage in former Buildings I, L, V, and AF. In addition, former Building AN was stated to be utilized for casting aluminum. Additionally, a drum storage pad was located in the central portion of the property.
- A historical record documented a small amount of nuclear source material was located in the soundproofing room of former Building C. The US Nuclear Regulatory Commission terminated the license prior to 1985; however, indicated that there was no clear documentation to terminating the license. No additional information was available.

A Phase II was completed in 2012 to assess the above identified RECs. A total of 30 soil borings (SB-1 through SB-30) were advanced on the subject property and four hand augers (HA-1 through HA-4) were advanced in select areas of former disposal, select UST basins, and some select chemical storage areas. It should be noted that none of the borings were advanced within the footprint of the former buildings. Additionally, 10 existing monitoring wells (MW7, MW9, MW10, MW11, MW12, MW-A, MW-D, MW-E, MW-G, MW-H) were sampled.

The soil and groundwater samples were analyzed for VOCs, PNAs, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and/or zinc), or some combination thereof. During the sampling in the vicinity of former fuel oil USTs at Building D, six inches of fuel oil was observed in monitoring well MW-C. Analytical results for soil indicated that various VOCs, PNAs, and metals were detected above Part 201 DWP and GSIP cleanup criteria. Additionally,

arsenic exceeded the Part 201 Residential Direct Contact (DC) cleanup criteria and phenanthrene exceeded Infinite Source Volatile Soil Inhalation Criteria (VSIC) and Finite VSIC cleanup criteria. No PCBs were detected. Analytical results for groundwater indicated that various VOCs and lead exceeded DW cleanup criteria. Based on these results, a BEA was completed.

A subsequent Phase II ESA was reportedly performed in which 15 soil borings and four hand borings were advanced and five of the monitoring wells were sampled; however, the information provided was from the previously discussed 2012 sampling event. The report recommended excavation of impacted soils within the known disposal areas.

PM completed a Phase I ESA in November 2015 that identified the facility status, historically identified dumping and disposal, potential for orphan USTs and/or a release, historical testing, research, and manufacturing operations, and the potential for migration from the north and west as RECs. The scope of work outlined below was conducted to evaluate the RECs.

1.5 2015/2016 Subsurface Site Investigation

Prior to the commencement of field activities, MISSDIG, a utility locating service, was contacted to locate utilities on or adjacent to the subject property. Utilities were marked by the respective utility companies where they entered or were located adjacent to the subject property.

1.5.1 Geophysical Investigation

Between December 7 and 9, 2015, PM completed a GPR survey on the subject property to investigate the presence of potential orphan USTs.

Four anomalies suggestive of orphan USTs and one anomaly suggestive of an orphan drum were identified during the GPR survey. The anomalies are located in the central portion of the property and southern portion of the property. Hand auger soil borings were advanced near the center of the three shallower anomalies. Further evaluation of the deeper anomaly was limited by the depth of the available equipment. Refusal was encountered and a commercial metal detector (Schonstedt) was used to verify that two out of the three anomalies were metallic in nature.

1.5.2 Subsurface Investigation

On December 7 and 8, 2015, PM completed a scope of work consisting of the advancement of 21 soil borings (SB-1 through SB-21), installation of 16 temporary monitoring wells (TMW-3 through TMW-14, TMW-16, and TMW through TMW-20), and sampling four existing monitoring wells (MW-7, MW-10, MW-11, and MW-12). A total of 19 soil and 20 groundwater samples were analyzed for VOCs, SVOCs, PCBs, and metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc), or some combination thereof.

On March 1, 2016, PM completed a scope of work consisting of the advancement of 13 soil borings (SB-3R, SB-8R, SB-22 through SB-32), installation of 11 temporary monitoring wells (TMW-3R, TMW-8R, TMW-22 through TMW-27 and TMW-30 through TMW-32), and the collection of groundwater from two existing monitoring wells (MW-9 and MW-10). Samples were analyzed for VOCs, PNAs, PCBs, arsenic, lead, and mercury, or some combination thereof.

The table below summarizes the Phase II ESA activities including total boring depth, objective of the soil borings, and sample justification.

DESCRIPTION OF SOIL BORING/TEMPORARY MONITORING WELL SAMPLING LOCATIONS

Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Depth and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
SB-1 (20.0)	5.0-6.0	NA	VOCs, SVOCs, PCBs, metals	Assess disposal and/or fill material on the northern portion of the property	Soil: Sample collected from interval with observed brick debris. GW: Not encountered.
SB-2 (15.0)	3.0-4.0	NA	VOCs, SVOCs, PCBs, metals	Assess disposal and/or fill material on the northern portion of the property	Soil: Sand/clay interface sample collected based on the lack of field evidence of contamination. GW: Not encountered.
SB/TMW-3 (15.0)	NA	9.0-14.0 [9.27]	VOCs, SVOCs, metals	Assess disposal and/or fill material on the northern portion of the property	Soil: A soil sample was not collected based on the lack of field evidence of contamination or debris. GW: Sampled.
SB/TMW-3R (20.0)	3.0-4.0	7.0-12.0 [8.80]	VOCs, SVOCs, metals	Resample the area around SB-3	Soil: Soil sample collected based on the observed brick debris. GW: Sampled.
SB/TMW-4 (15.0)	1.0-2.0	7.4-12.4 [8.52]	VOCs, SVOCs, PCBs, metals	Assess former drum storage area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-5 (15.0)	1.0-2.0	7.2-12.2 [8.38]	VOCs, SVOCs, PCBs, metals	Assess former drum storage area	Soil: Shallow sample collected based on the lack of field evidence of contamination in unsaturated soils. GW: Sampled.
SB/TMW-6 (15.0)	NA	7.1-12.1 [7.99]	VOCs, SVOCs, metals	Assess former drum storage area	Soil: A soil sample was not analyzed based on the lack of field evidence of contamination in unsaturated soils. GW: Sampled.
SB/TMW-7 (15.0)	8.0-9.0	7.4-12.4 [8.96]	VOCs, SVOCs, PCBs, metals	Assess former vehicle fueling area	Soil: Sample collected above the saturated zone based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-8 (15.0)	1.0-2.0	9.8-14.8 [11.04]	VOCs, SVOCs, PCBs, metals	Assess former chemical research area	Soil: Sample collected from the interval with the highest PID reading (6.0 ppm). GW: Sampled.

**Baseline Environmental Assessment of the Former Ethyl Corp Property
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Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Depth and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
SB/TMW-8R (15.0)	Not sampled	7.5-12.5 [9.78]	VOCs	Resample groundwater in the area of TMW-8	GW: Sampled.
SB/TMW-9 (15.0)	1.0-2.0	8.1-13.1 [9.34]	VOCs, SVOCs, PCBs, metals	Assess former chemical storage area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-10 (15.0)	1.0-2.0	7.0-12.0 [7.60]	VOCs, SVOCs, PCBs, metals	Assess former incinerator area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-11 (20.0)	1.0-2.0	8.9-13.9 [9.42]	VOCs, SVOCs, PCBs, metals	Assess former fuel storage area	Soil: Shallow sample collected based on the lack of field evidence of contamination in unsaturated soils. GW: Sampled.
SB/TMW-12 (15.0)	1.0-2.0	8.2-13.2 [9.67]	VOCs, SVOCs, PCBs, metals	Assess former maintenance and storage area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-13 (15.0)	1.0-2.0	9.3-14.3 [10.32]	VOCs, SVOCs, PCBs, metals	Assess former analytical laboratory	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-14 (20.0)	1.0-2.0	8.1-13.1 [9.36]	VOCs, SVOCs, PCBs, metals	Assess former machine shop area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB-15 (15.0)	1.0-2.0	NA	VOCs, SVOCs, PCBs, metals	Assess former machine shop area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Not sampled.
SB/TMW-16 (15.0)	1.0-2.0	8.9-13.9 [9.71]	VOCs, SVOCs, PCBs, metals	Assess former fuel blending area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB-17 (15.0)	1.0-2.0	NA	VOCs, SVOCs, PCBs, metals	Assess former engine research area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Not sampled.

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Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Depth and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
SB/TMW-18 (15.0)	7.0-8.0	9.1-14.1 [10.50]	VOCs, SVOCs, PCBs, metals	Assess former engine research area	Soil: Sample collected from the interval with the highest PID reading (1.1 ppm). GW: Sampled.
SB/TMW-19 (20.0)	1.0-2.0	8.3-13.3 [9.94]	VOCs, SVOCs, PCBs, metals	Assess former chemical research area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-20 (15.0)	1.0-2.0	9.6-14.6 [10.93]	VOCs, SVOCs, PCBs, metals	Assess former chemical research area	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB-21 (15.0)	8.0-9.0	NA	VOCs, SVOCs, PCBs, metals	Assess disposal and/or fill material on the northern portion of the property	Soil: Clay/sand interface sample collected based on the lack of field evidence of contamination. GW: Not encountered.
SB/TMW-22 (15.0)	3.0-4.0	7.3-12.3 [8.68]	VOCs, PNAs, PCBs, metals	Further evaluate impact in the area of SB-3	Soil: Sample collected from an interval with observed debris. GW: Sampled.
SB/TMW-23 (15.0)	4.0-5.0	7.6-12.6 [7.98]	VOCs, PNAs, PCBs, metals	Further evaluate impact in the area of SB-3	Soil: Sample collected from an interval with observed debris. GW: Sampled.
SB/TMW-24 (15.0)	3.0-4.0	7.4-12.4 [8.64]	VOCs, PNAs, PCBs, metals	Further evaluate impact in the area of SB-3	Soil: Based on the lack of field evidence of contamination, a sample was collected from an interval consistent with soil impact in the area. GW: Sampled.
SB/TMW-25 (15.0)	4.0-5.0	4.6-9.6 [5.75]	VOCs, PNAs, PCBs, metals	Further evaluate the northern portion of the property for fill and/or contamination	Soil: Sample collected from an interval with observed debris. GW: Sampled.
SB/TMW-26 (15.0)	2.0-3.0	8.5-13.5 [10.22]	VOCs, PNAs, PCBs, metals	Further evaluate the northern portion of the property for fill and/or contamination	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Sampled.

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Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Depth and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
SB/TMW-27 (15.0)	4.0-5.0	6.2-11.2 [7.24]	VOCs, PNAs, PCBs, metals	Further evaluate the northern portion of the property for fill and/or contamination	Soil: Sample collected from an interval with observed debris. GW: Sampled.
SB-28 (15.0)	3.0-4.0	NA	VOCs, PNAs, PCBs, metals	Further evaluate the northern portion of the property for fill and/or contamination	Soil: Sample collected from an interval with observed debris. GW: Not encountered.
SB-29 (15.0)	1.0-2.0	NA	VOCs, PNAs, PCBs, metals	Further evaluate the northern portion of the property for fill and/or contamination	Soil: Shallow sample collected based on the lack of field evidence of contamination. GW: Not encountered.
SB/TMW-30 (15.0)	8.0-9.0	9.2-14.2 [11.06]	VOCs, PNAs, PCBs	Evaluate the area where NAPL was previously identified	Soil: UST depth sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-31 (15.0)	7.0-8.0	8.8-13.8 [10.76]	VOCs, PNAs, PCBs	Evaluate the area where NAPL was previously identified	Soil: UST depth sample collected based on the lack of field evidence of contamination. GW: Sampled.
SB/TMW-32 (20.0)	8.0-9.0	8.6-13.6 [10.88]	VOCs, PNAs, PCBs	Evaluate the area where NAPL was previously identified	Soil: UST depth sample collected based on the lack of field evidence of contamination in the unsaturated soils. GW: Sampled.
MW-C (northern)	NA	[9.80]	VOCs	Collected current data from existing monitoring wells	GW: Sampled.
MW-7	NA	[13.58]	VOCs	Collected current data from existing monitoring wells	GW: Sampled.
MW-9	NA	[9.80]	VOCs	Collected current data from existing monitoring well	GW: Sampled.
MW-10	NA	[11.60]	VOCs	Collected current data from existing monitoring well	GW: Sampled.
MW-11	NA	[20.04]	VOCs	Collected current data from existing monitoring wells	GW: Sampled.

Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Depth and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
MW-12	NA	[11.41]	VOCs	Collected current data from existing monitoring wells	GW: Sampled.

bgs – below ground surface
 ppm – parts per million

PID – photoionization detector
 DTW – depth to water

GW - groundwater

1.5.3 Investigation Techniques and QA/QC Procedures

The soil borings were advanced to the desired depth using a direct push drill rig and/or stainless steel hand auger. Soil sampling was performed for soil classification, verification of subsurface geologic conditions, and for investigating the potential and/or extent of soil and groundwater contamination at the subject property.

During drilling operations, the drilling equipment was cleaned to minimize the possibility of cross contamination. These procedures included cleaning equipment with a phosphate free solution (i.e., Alconox®) and rinsing with distilled water after each sample collection. Drilling and sampling equipment was also cleaned in this manner prior to initiating field activities.

Soils collected from discrete sample intervals were screened using a PID to determine if VOCs were present. Soil from specific depths was placed in plastic bags, sealed, and allowed to volatilize. The headspace within each bag was then monitored with the PID. The PID is able to detect trace levels of organic compounds in the air space within the plastic bag. The PID utilizes a 10.6 electron volts (eV) lamp. Soil samples were collected from the soil borings based upon the highest PID reading, visual/olfactory evidence, a change in geology, surficial soil, and/or directly above saturated soil.

Soil samples for VOC analysis were preserved with methanol, in accordance with United States Environmental Protection Agency (USEPA) method 5035. The soil samples were placed in appropriately labeled containers with Teflon lined lids and/or sanitized glass jars, placed in an ice packed cooler, and transported under chain of custody procedures for laboratory analysis within applicable holding times.

The temporary monitoring wells were installed to collect groundwater samples for chemical analysis. New well assemblies were used for the temporary wells, consisting of a 5-foot long, one-inch diameter, 0.010-inch slot, schedule 40, PVC screen and a 1-inch diameter PVC casing. After the screen for the well was set to the desired depth, natural sands were allowed to collapse around the well screen. The wells were developed using either a new disposable 0.9-inch diameter bailer or peristaltic pump equipped with new, chemically inert, 3/8-inch diameter polyethylene and silicon tubing. Well development was performed by purging until clear, turbid free groundwater was observed coming from the well.

Groundwater samples collected from the temporary or permanent monitoring wells were generally collected using low flow sampling methods and protocols using a peristaltic pump equipped with new, chemically inert, 3/8-inch diameter polyethylene and silicon tubing. The samples were collected into preserved vials or bottles or within unpreserved bottles or jars, as applicable for the analyte and/or method.

All samples collected were transported under chain of custody procedures for laboratory analysis within applicable holding times. Upon completion of the investigation, the temporary well materials were removed from the soil borings and the soil borings were abandoned by placing the soil cuttings back into the borehole, filling the void with bentonite chips, hydrating the chips, resurfacing and returning the area to its pre-drilling condition.

1.6 Geology and Hydrogeology

Based on review of soil boring logs, the soil stratigraphy generally consists of loose sand to a depth of at least 20.0 feet bgs. Clay, silty clay, or sandy clay was encountered on the northern portion of the property up to a depth of at least 20.0 feet bgs. Discontinuous fill and debris (brick, concrete, glass) was encountered on the northern portion of the property typically up to a depth of 5.0 feet bgs. Groundwater was generally encountered at depths of 8.0 to 11.0 feet bgs.

Soil boring logs depicting the soil stratigraphy and PID readings from the 2012 site investigation and PM's 2015 and 2016 site investigation are included in Appendix B.

2.0 LOCATION OF CONTAMINATED MEDIA ON THE SUBJECT PROPERTY

The analytical results for the samples collected during site investigation activities conducted by PM were compared with the MDEQ Generic Cleanup Criteria and Screening Levels as presented in Part 201 Rules 299.1 through 299.50, dated December 30, 2013 entitled "Cleanup Criteria Requirements for Response Activity", in accordance with Section 20120a(1) using the Residential and Nonresidential cleanup criteria.

The analytical results are summarized on Figures 5A, 5B, and 6 and in Tables 1 through 5. Laboratory analytical reports from RJN's 2012 and PM's 2015 and 2016 site investigations are included in Appendix C.

2.1 Soil Analytical Results

The table below summarizes the analytical results with target analyte concentrations in excess of Part 201 cleanup criteria in soil from site investigation activities completed by RJN in 2012 and PM in 2015 and 2016.

A full summary of the soil analytical results is presented on Figure 5A and 5B and in Tables 1A through 3B.

SUMMARY OF SOIL ANALYTICAL RESULTS

Sample ID (Date)	Depth (ft bgs)	Part 201 cleanup criteria (cleanup criteria Exceeded (Yes/No))						Compounds Exceeding Part 201 cleanup criteria
		DWP (R/NR)	GSIP	SVII (R/NR)	VSI (R/NR)	DC (R)	DC (NR)	
SB-3 (10/2012)	10.0-12.0	YES	YES	No	No	YES	No	Arsenic
SB-5 (10/2012)	10.0-12.0	YES	YES	No	No	No	No	Petroleum VOCs
SB-7 (10/2012)	10.0-12.0	YES	YES	No	YES	No	No	Petroleum VOCs, PNAs
SB-25 (10/2012)	10.0-12.0	YES	YES	No	YES	No	No	Petroleum VOCs, PNAs

Sample ID (Date)	Depth (ft bgs)	Part 201 cleanup criteria (cleanup criteria Exceeded (Yes/No))						Compounds Exceeding Part 201 cleanup criteria
		DWP (R/NR)	GSIP	SVII (R/NR)	VSI (R/NR)	DC (R)	DC (NR)	
SB-27 (10/2012)	10.0-12.0	YES	YES	No	No	No	No	Petroleum VOCs, PNAs
SB-3R (03/2016)	3.0-4.0	No	YES	No	No	No	No	PNAs
SB-11 (12/2015)	1.0-2.0	No	YES	No	No	No	No	Phenanthrene, mercury
SB-14 (12/2015)	1.0-2.0	No	YES	No	No	No	No	Mercury
SB-16 (12/2015)	1.0-2.0	No	YES	No	No	No	No	Mercury
SB-17 (12/2015)	1.0-2.0	No	YES	No	No	YES	YES	PNAs, mercury
SB-18 (12/2015)	7.0-8.0	No	YES	No	No	YES	No	PNAs, mercury
SB-22 (03/2016)	3.0-4.0	No	YES	No	No	No	No	Mercury
SB-25 (03/2016)	4.0-5.0	YES	YES	No	No	YES	No	TCE, arsenic
SB-27 (03/2016)	4.0-5.0	YES	YES	No	YES	YES	YES	PNAs, arsenic, mercury
SB-29 (03/2016)	1.0-2.0	YES	YES	No	No	No	No	Arsenic

R – Residential
 NR – Nonresidential

DWP – Drinking Water Protection
 GSIP – Groundwater Surface Water Interface Protection

2.2 Groundwater Analytical Results

The table below summarizes the analytical results with target analyte concentrations in excess of Part 201 cleanup criteria in groundwater from site investigation activities completed by RJN in 2012 and PM in 2015 and 2016.

Groundwater analytical results are presented on Figure 6 and in Tables 4A, 4B, and 5.

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Sample ID (Date)	Depth to Water (ft bgs)	Part 201 cleanup criteria (cleanup criteria Exceeded (Yes/No))					Compounds Exceeding Part 201 cleanup criteria
		DW (R/NR)	GSI	VISL (R)	VISL (NR)	GVII (R/NR)	
MW7 (10/2012)	Not reported	YES	No	No	No	No	1,2-Dichloroethane, lead
MW9 (10/2012)	Not reported	YES	No	YES	No	No	TCE
MW10 (10/2012)	Not reported	YES	No	YES	No	No	TCE
MW7 (10/2012)	Not reported	YES	No	No	No	No	1,2-Dichloroethane
TMW-3 (12/2015)	9.27	YES	YES	No	No	No	Chlorobenzene, arsenic

Sample ID (Date)	Depth to Water (ft bgs)	Part 201 cleanup criteria (cleanup criteria Exceeded (Yes/No))					Compounds Exceeding Part 201 cleanup criteria
		DW (R/NR)	GSI	VISL (R)	VISL (NR)	GVII (R/NR)	
TMW-8 (12/2015)	11.04	No	YES	NA	No	No	1,2-Dichlorobenzene
TMW-8R (03/2016)	9.78	No	YES	No	No	No	1,2-Dichlorobenzene
TMW-16 (12/2015)	9.71	YES	No	No	No	No	PCE
TMW-18 (12/2015)	10.50	YES	No	NA	No	No	PCE
TMW-24 (03/2016)	8.64	YES	YES	No	No	No	Arsenic
TMW-26 (03/2016)	10.22	YES	No	NA	No	No	1,1,2-TCA, TCE
TMW-32 (03/2016)	10.88	No	YES	NA	No	No	Chlorobenzene, PNAs
MW-B/11 (12/2015)	9.8	YES	No	No	No	No	1,2-Dichloroethane
MW-10 (03/2016)	11.60	YES	No	NA	No	No	TCE

R – Residential
 NR – Nonresidential
 TCE - trichloroethylene
 TCA - trichloroethane

DW – Drinking Water
 GSI – Groundwater Surface Water Interface
 VISL – Vapor Intrusion Screening Level
 GVII – Groundwater Volatilization to Indoor Air Inhalation

Mobile NAPL was historically identified in a monitoring well (MW-C) in the area of TMW-32. Due to the absence of the monitoring well, soils borings were advanced and temporary monitoring wells were installed in 2016 to evaluate the area. Although mobile NAPL was not observed in the temporary monitoring wells, soil conditions appeared consistent with the presence of residual fuel oil NAPL.

2.3 Subject Property Facility Status

A location where a hazardous substance is present in excess of the concentrations, which satisfy the requirements of subsection 20120a(1)(a) or (17), is a facility pursuant to Part 201. Section 20120a(1)(a) requirements are the cleanup criteria for unrestricted residential usage.

Contaminant concentrations identified on the subject property indicate exceedances to the Part 201 Residential and Nonresidential DWP/DW, GSIP/GSI, DC, and VSI cleanup criteria, and Residential groundwater VISLs. Therefore, the subject property is a facility under Part 201 of P.A. 451, as amended, and the rules promulgated thereunder.

3.0 PROPERTY INFORMATION

3.1 Legal Description of Subject Property

A copy of the legal description is included in Appendix D as part of the assessing information.

3.2 Map of Subject Property

Refer to Figure 1, Property Location Map; and Figure 2, Generalized Diagram of the Subject Property and Surrounding Area, which depicts the property/parcel boundaries.

3.3 Subject Location and Analytical Summary Maps

Figures 5A, 5B, and 6 provide scaled maps of the subject property with site structures and sampling locations with analytical results.

3.4 Subject Property Location Map

Figures 1 and 2 provide scaled area maps depicting the subject property location in relation to the surrounding area.

3.5 Subject Property Address

As indicated in Section 1.0, the subject property (Parcel ID: 25-33-451-003 and 25-33-451-005) is located at 1600 West Eight Mile Road, Ferndale, Oakland County, Michigan 48220.

3.6 Subject Spatial Data

As depicted in Figure 1, the subject property is located in township one North (T.1N), range 11 East (R.11E), and section 33, southeast quarter, southwest and northwest quarter-quarter in Ferndale, Oakland County, Michigan.

According to the MDEQ GeoWebFace website, the center of the subject property is located at latitude 42.4480 and a longitude of -83.1490.

4.0 FACILITY STATUS OF SUBJECT PROPERTY

As indicated in Section 2.4, based upon documented exceedances of the Part 201 Residential and Nonresidential DWP/DW, GSIP/GSI, DC, and VSI cleanup criteria, and Residential groundwater VISLs in samples collected from the subject property, the subject property is a facility as defined under Part 201 of P.A. 451, as amended, and the rules promulgated thereunder.

4.1 Summary Data Tables

The analytical results were compared with the MDEQ Generic Cleanup Criteria and Screening Levels as presented in Part 201 Rules 299.1 through 299.50, dated December 30, 2013 entitled "Cleanup Criteria Requirements for Response Activity" in accordance with Section 20120a(1) using the Residential and Nonresidential cleanup criteria.

The analytical results for compounds exceeding Part 201 cleanup criteria are summarized in Section 2.0. A summary of the analytical results are included in Tables 1A through 5.

4.2 Laboratory Reports and Chain of Custody Documentation

Samples collected by PM in 2015 and 2016 were submitted to Merit Laboratories, East Lansing, Michigan for chemical analysis under chain of custody procedures and within applicable holding times. Refer to the PM's laboratory analytical reports in Appendix C.

5.0 IDENTIFICATION OF BEA AUTHOR

This BEA was conducted on June 17, 2016, by Mr. Jamie Antoniewicz, P.E., Project Engineer, and reviewed by Mr. J. Adam Patton, CHMM, Manager of Site Investigation Services, PM

Environmental, Inc., which is prior to or within 45 days of becoming the property owner or operator. Qualification statements are provided as Appendix E.

We declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312 and we have the specific qualifications based on education, training, and experience to assess a property of the nature and history of the subject property. We have developed and performed the all appropriate inquires in conformance with the standards and practices set forth in 40 CFR Part 312.



Jamie Antoniewicz, P.E.
Project Engineer



J. Adam Patton, CHMM
Manager of Site Investigation Services

6.0 AAI REPORT OR ASTM PHASE I ESA

As indicated in Section 1.3, PM completed a Phase I ESA update, dated June 16, 2016, in conformance with the scope and limitations of ASTM Practice E 1527-13, for the subject property (Parcel ID: 25-33-451-003 and 25-33-451-005) located 1600 West Eight Mile Road, Ferndale, Oakland County, Michigan 48220. The scope of the Phase I ESA included consideration of hazardous substances as defined in Section 20101(1)(x) of P.A 451 of 1994, as amended, and constituted the performance of an All Appropriate Inquiry in conformance with the standards and practices set forth in 40 CFR Part 312.

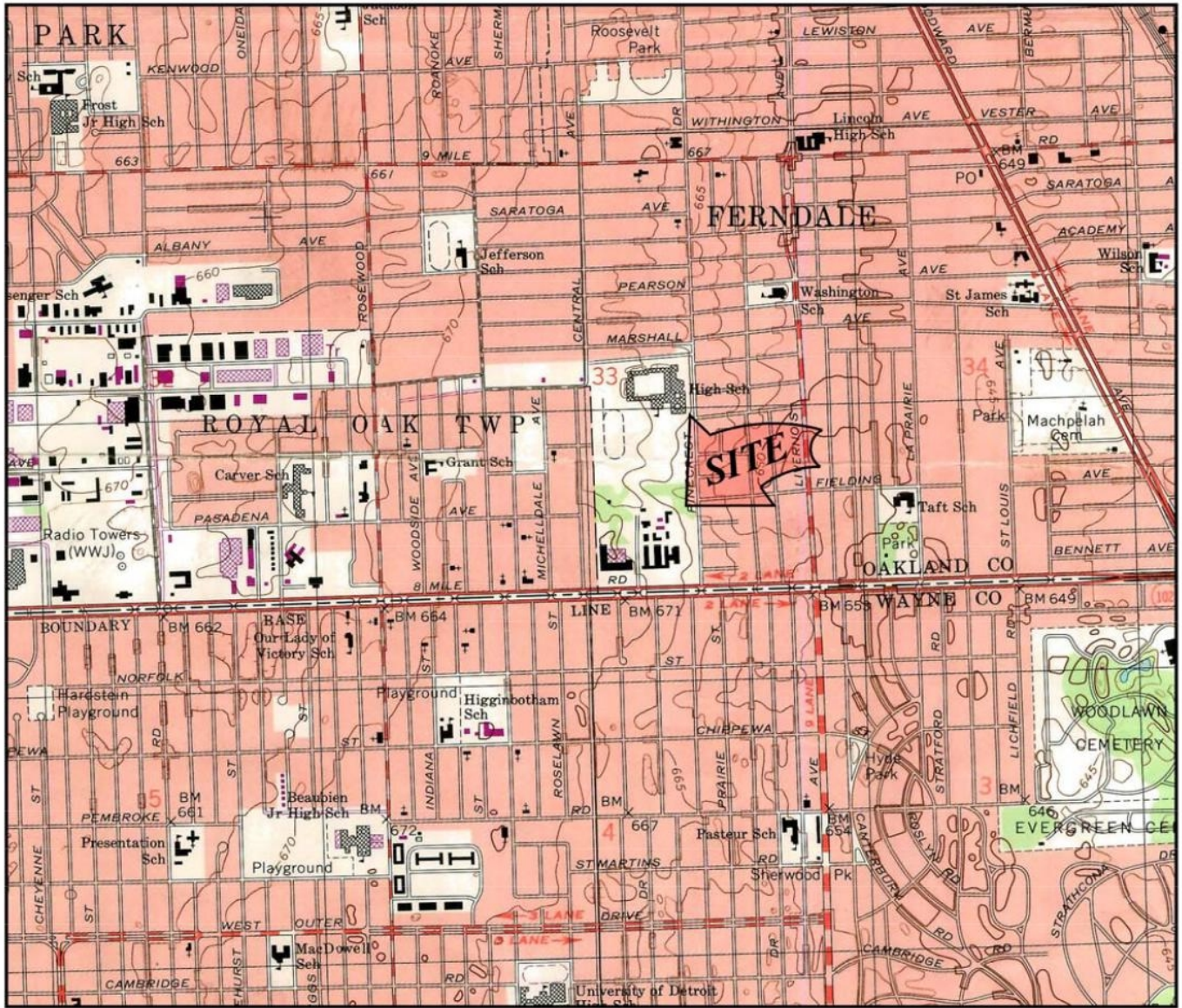
A copy of the June 2016 Phase I ESA update is included in Appendix A.

7.0 REFERENCES

- Michigan Department of Environmental Quality (MDEQ) Generic Cleanup Criteria and Screening Levels as presented in Part 201 Rules 299.1 through 299.50, dated December 30, 2013 entitled "Cleanup Criteria Requirements for Response Activity";
- MDEQ Operational Memorandum No. 4 "Site Characterization and Remediation Verification – Attachment 10, Peer Review Draft Groundwater Not in an Aquifer," February 2007;
- MDEQ Operational Memorandum No. 2 "Sampling and Analysis," October 22, 2004, Revised July 5, 2007;
- MDEQ June 2014 Non-Aqueous Phase Liquid (NAPL) Resource Document;
- MDEQ May 2013 Guidance Document for the Vapor Intrusion Pathway;
- Baseline Environmental Submittal Form (EQP 4025), September 2015;
- Health Department Correspondence, 1985-1986, Between Ethyl Corporation and Oakland County Health Division;
- LUST Closure Report, 4-3-1997, Swanson Environmental;
- Phase I ESA, 11-27-2012, RJN Environmental;
- BEA, 12-2-2012, RJN Environmental;
- Phase II ESA, 12-18-2012, RJN Environmental;
- Phase II ESA, 11-1-2013, RJN Environmental;
- Phase I ESA, 11-3-2015, PM; and,
- Phase I ESA, June 16, 2016, PM.

Figures





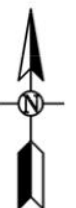
OAKLAND COUNTY



SCALE 1:24,000

FIGURE 1

PROPERTY VICINITY MAP
 USGS, 7.5 MINUTE SERIES
 ROYAL OAK, MI QUADRANGLE, 1996.



PROJ:
 VACANT INDUSTRIAL PROPERTY
 1600 WEST 8 MILE ROAD
 FERNDAL, MI

THIS IS NOT A LEGAL
 SURVEY

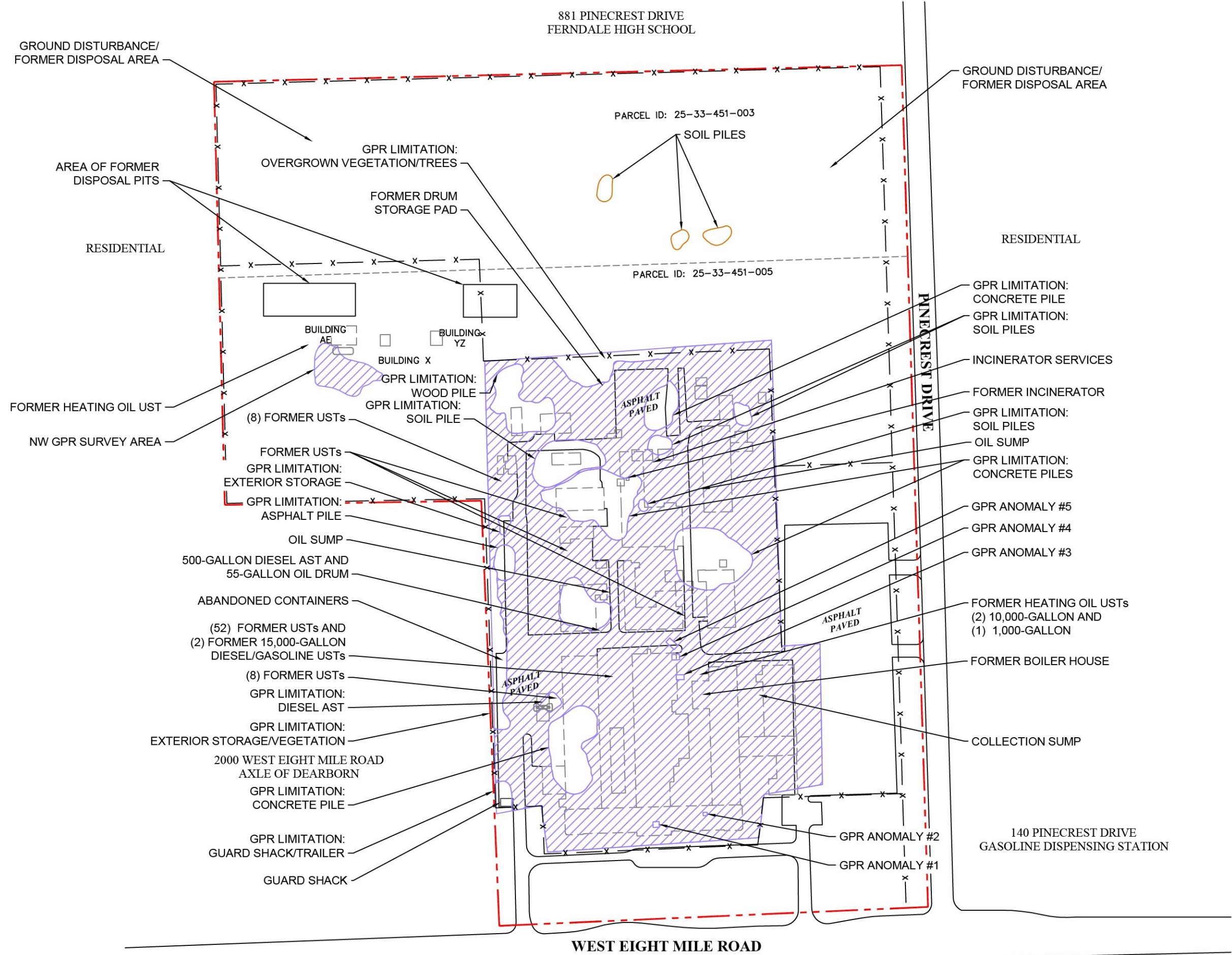
DRN BY: CS DATE: 11/2/2015

VERIFY SCALE

CHKD BY: LS SCALE: 1" = 2,000'

0 IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FILE NAME: 01-6124-0-001F01R00



LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURE
- FENCE
- PARCEL / LOT BOUNDARIES
- FORMER FUEL DISPENSER
- UST
- GPR SURVEY AREA
- GPR ANOMALY #5
- GPR ANOMALY #4
- GPR ANOMALY #3
- FORMER HEATING OIL USTs
- FORMER BOILER HOUSE
- COLLECTION SUMP



FIGURE 2
 GENERALIZED DIAGRAM OF THE SUBJECT PROPERTY AND ADJOINING PROPERTIES WITH GPR SURVEY AREA

PROJ: COMMERCIAL AND VACANT LAND
 1600 WEST 8 MILE ROAD
 FERNDALE, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: CS/ES	DATE: 6/17/2016
VERIFY SCALE	CHKD BY: LS/JA	SCALE: 1" = 180'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	FILE NAME:	01-6124-1-001F00R00

881 PINECREST DRIVE
 FERNDALE HIGH SCHOOL

PARCEL ID: 25-33-451-003

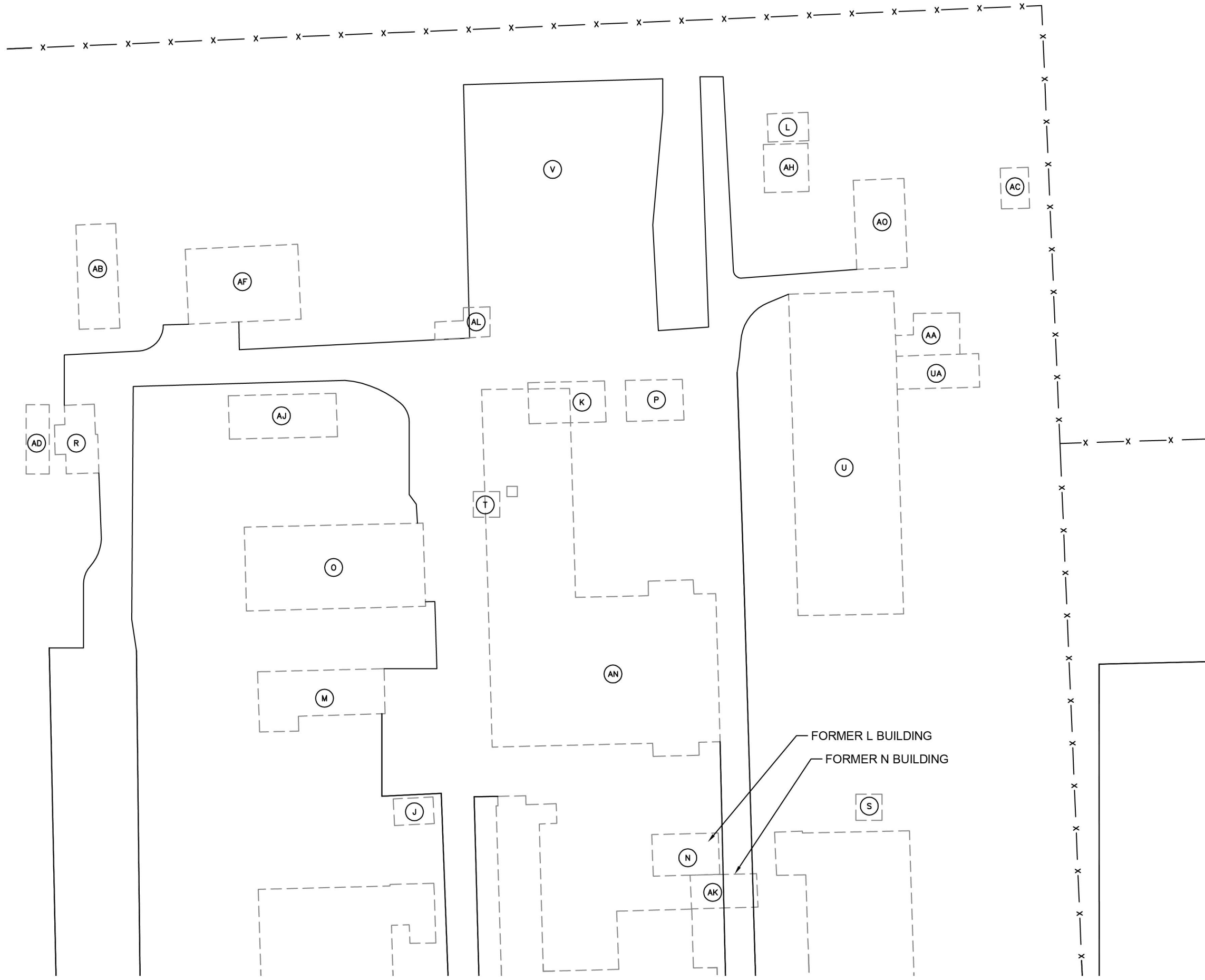
PARCEL ID: 25-33-451-005

7429-7745 WEST EIGHT MILE ROAD
 COMMERCIAL PROPERTIES

7461 WEST EIGHT MILE ROAD

7429 WEST EIGHT MILE ROAD

140 PINECREST DRIVE
 GASOLINE DISPENSING STATION



AL	VEHICLE FUELING
AC	ACTIVE METAL STORAGE
AD	CONCRETE SLAB
AH	CHEMICAL ENGINEERING PROJECTS
L	BULK CHEMICALS
UA	CHEMICAL RES.
U	CHEMICAL RES. AND PILOT PLANT
V	DRUM STORAGE
AF	DRUM STORAGE
AJ	CAN STORAGE
O	MAINTENANCE STORAGE
M	CHEMICAL DEVELOPMENT LAB
AN	EMISSIONS LAB
N	CHEMICAL STORAGE
AK	LIQUID NITROGEN
J	FUEL STORAGE
AB	CAN STORAGE
R	FLEET BUILDING
K	CHEMICAL SUPPLIES STORAGE
P	CHEMICAL STORAGE

LEGEND:

- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- x- FENCE

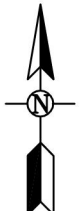
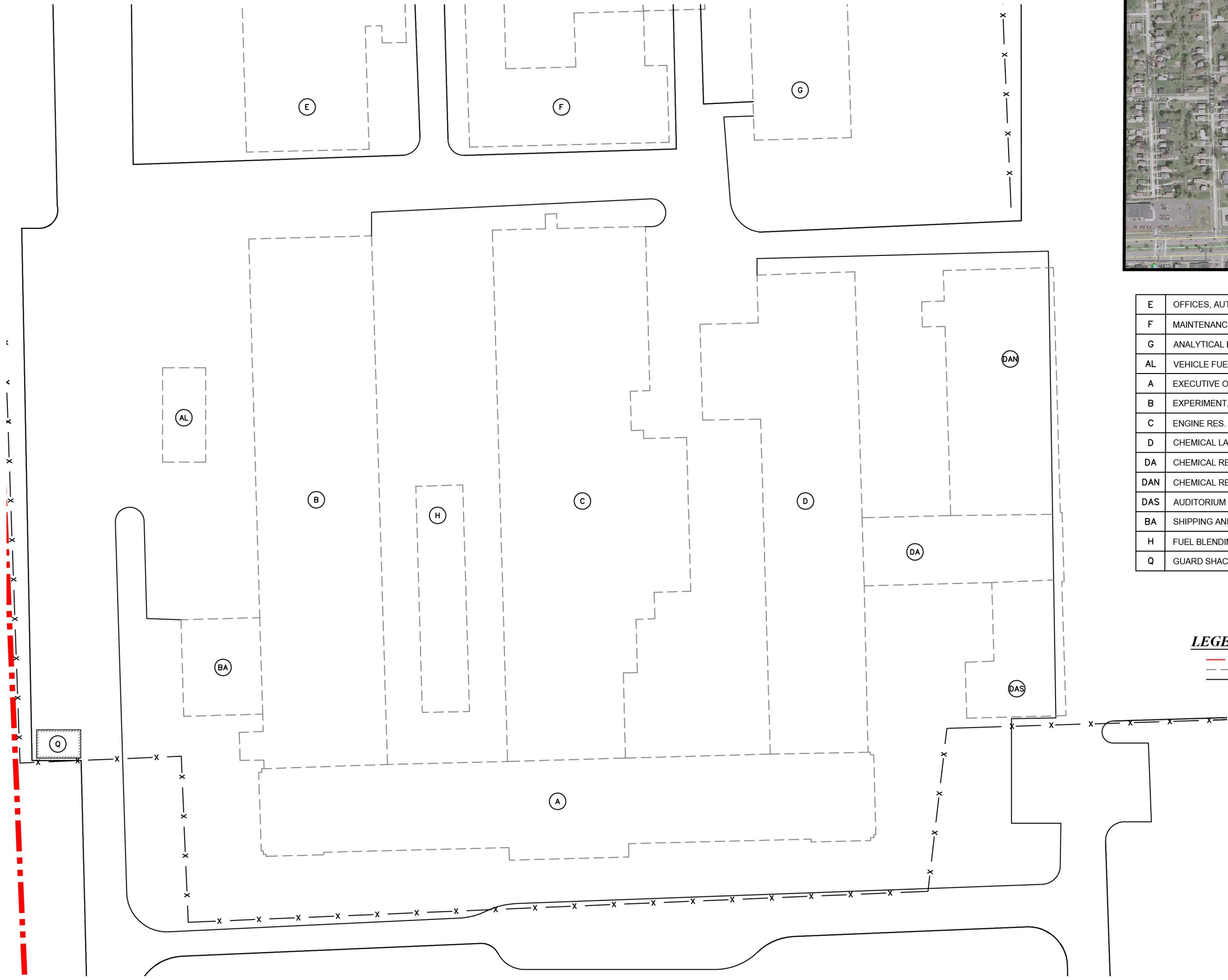


FIGURE 3
ZOOMED IN SECTION OF FORMER
NORTHERN BUILDINGS

PROJ: COMMERCIAL AND VACANT LAND
1600 WEST 8 MILE ROAD
FERNDAL, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: CS/ES	DATE: 6/17/2016
VERIFY SCALE	CHKD BY: LS/JA	SCALE: 1" = 50'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	FILE NAME:	01-6124-1-001F00R00



E	OFFICES, AUTO APP. DEPARTMENT
F	MAINTENANCE AND SERVICES
G	ANALYTICAL LAB
AL	VEHICLE FUELING
A	EXECUTIVE OFFICES
B	EXPERIMENT, MACHINE SHOP, GARAGE AND REF. TECHNICIAN
C	ENGINE RES. AND DYNAMOMETER
D	CHEMICAL LAB, LIBRARY, PHOTO AND FILES
DA	CHEMICAL RES., EXECUTIVE OFFICES AND PLANT
DAN	CHEMICAL RES. LAB
DAS	AUDITORIUM
BA	SHIPPING AND RECEIVING, AND COMPUTERS
H	FUEL BLENDING
Q	GUARD SHACK

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- x- FENCE

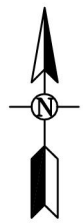
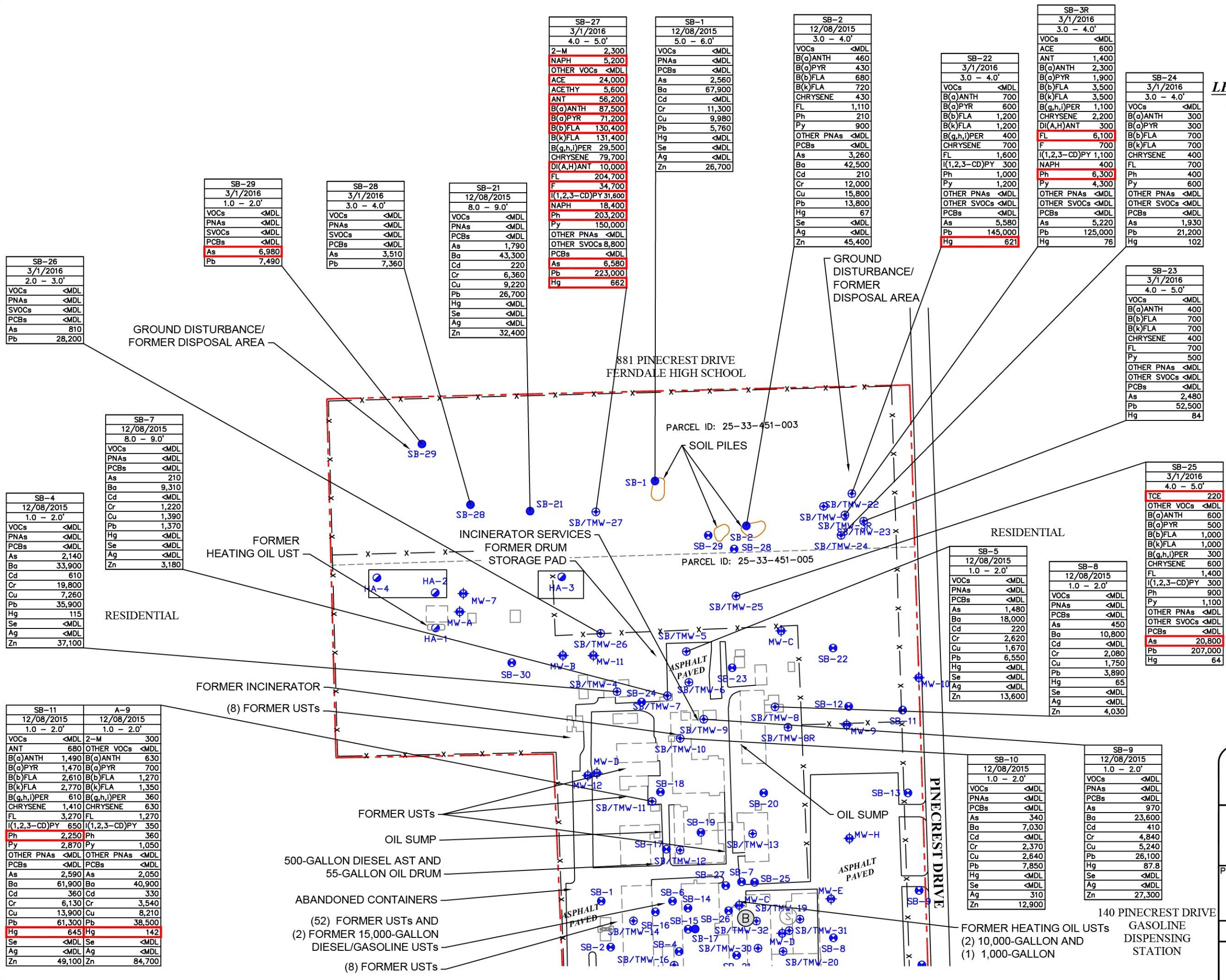


FIGURE 4
ZOOMED IN SECTION OF FORMER SOUTHERN BUILDINGS

PROJ: COMMERCIAL AND VACANT LAND
1600 WEST 8 MILE ROAD
FERNDAL, MI

<p>THIS IS NOT A LEGAL SURVEY</p> <p>VERIFY SCALE</p> <p>0 50'</p> <p>IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.</p>	DRN BY: CS/ES	DATE: 6/17/2016
	CHKD BY: LS/JA	SCALE: 1" = 50'
FILE NAME: 01-6124-1-001F00R00		



LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURE
- FENCE
- PARCEL / LOT BOUNDARIES
- FORMER FUEL DISPENSER
- COLLECTION SUMP
- UST
- UNDERGROUND STORAGE TANK
- FORMER BOILER HOUSE
- SOIL BORING
- ⊕ SOIL BORING / TEMPORARY MONITORING WELL
- ⊕ MONITORING WELL
- ⊕ PREVIOUS 2012 RJN SOIL BORING
- ⊕ PREVIOUS SOIL BORING
- ⊕ PREVIOUS MONITORING WELL
- As ARSENIC
- Ba BARIUM
- Cd CADMIUM
- Cr CHROMIUM
- Pb LEAD
- Hg MERCURY
- Ag SILVER
- Zn ZINC
- ACE ACENAPHTHENE
- ANT ANTHRACENE
- B(a)ANTH BENZO(a)ANTHRACENE
- B(a)PYR BENZO(a)PYRENE
- B(b)FLA BENZO(b)FLUORANTHENE
- B(g,h,i)PER BENZO(g,h,i)PERYLENE
- B(k)FLA BENZO(k)FLUORANTHENE
- F FLUORENE
- FL FLUORANTHENE
- I(1,2,3-CD)PY INDENO(1,2,3,CD)PYRENE
- 2-M 2-METHYLNAPHTHALENE
- NAPH NAPHTHALENE
- Ph PHENANTHRENE
- Py PYRENE
- DI(A,H)ANT DIBENZO(a,h)ANTHRACENE
- TCE TRICHLOROETHENE
- TRICLFL METH TRICHLOROFLUOROMETHANE
- VOCs VOLATILE ORGANIC COMPOUNDS
- PNAs POLYNUCLEAR AROMATIC COMPOUNDS
- PCBs POLYCHLORINATED BIPHENYLS
- MDL METHOD DETECTION LIMIT
- UNITs μg/Kg (UNLESS NOTED)
- VALUE EXCEEDS CRITERIA

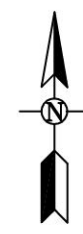


FIGURE 5A
SOIL BORING/TEMPORARY MONITORING WELL AND MONITORING WELL LOCATION MAP WITH NORTHERN SOIL ANALYTICAL RESULTS

PROJ: COMMERCIAL AND VACANT LAND
1600 WEST 8 MILE ROAD
FERNDALE, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: CS/ES	DATE: 6/17/2016
VERIFY SCALE	CHKD BY: LS/JA	SCALE: 1" = 200'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.		FILE NAME: 01-6124-1-001F00R00

GROUND DISTURBANCE/
 FORMER DISPOSAL AREA

GROUND DISTURBANCE/
 FORMER DISPOSAL AREA

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURE
- FENCE
- PARCEL / LOT BOUNDARIES
- FORMER FUEL DISPENSER
- COLLECTION SUMP
- UST
- UNDERGROUND STORAGE TANK
- FORMER BOILER HOUSE
- SOIL BORING
- ⊕ SOIL BORING / TEMPORARY MONITORING WELL
- ⊕ MONITORING WELL
- ⊕ PREVIOUS 2012 RJN SOIL BORING
- ⊕ PREVIOUS SOIL BORING
- ⊕ PREVIOUS MONITORING WELL
- As ARSENIC
- Ba BARIUM
- Cd CADMIUM
- Cr CHROMIUM
- Pb LEAD
- Hg MERCURY
- Ag SILVER
- Zn ZINC
- ACE ACENAPHTHENE
- ANT ANTHRACENE
- B(a)ANTH BENZO(a)ANTHRACENE
- B(a)PYR BENZO(a)PYRENE
- B(b)FLA BENZO(b)FLUORANTHENE
- B(g,h,i)PER BENZO(g,h,i)PERYLENE
- B(k)FLA BENZO(k)FLUORANTHENE
- F FLUORANTHENE
- FL FLUORANTHENE
- I(1,2,3-CD)PY INDENO(1,2,3,CD)PYRENE
- 2-M 2-METHYLNAPHTHALENE
- NAPH NAPHTHALENE
- Ph PHENANTHRENE
- Py PYRENE
- DI(A,H)ANT DIBENZO(a,h)ANTHRACENE
- TCE TRICHLOROETHENE
- TRICLFL METH TRICHLOROFLUOROMETHANE
- VOCs VOLATILE ORGANIC COMPOUNDS
- PNAs POLYNUCLEAR AROMATIC COMPOUNDS
- PCBs POLYCHLORINATED BIPHENYLS
- MDL METHOD DETECTION LIMIT
- UNITs VALUE EXCEEDS CRITERIA
- NOTES: REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED

SB-17	
12/07/2015	
1.0 - 2.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	<MDL
Ba	9,630
Cd	<MDL
Cr	940
Cu	<MDL
Pb	3,260
Hg	<MDL
Se	<MDL
Ag	<MDL
Zn	2,170

SB-12	
12/07/2015	
1.0 - 2.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	<MDL
Ba	9,630
Cd	<MDL
Cr	940
Cu	<MDL
Pb	3,260
Hg	<MDL
Se	<MDL
Ag	<MDL
Zn	2,170

SB-11	
12/08/2015	
1.0 - 2.0'	
VOCs	<MDL
ANT	680
B(a)ANTH	1,490
B(a)PYR	1,470
B(b)FLA	2,610
B(k)FLA	2,770
B(g,h,i)PER	610
CHRYSENE	1,410
FL	3,270
I(1,2,3-CD)PY	650
Ph	2,250
Py	2,870
OTHER PNAs	<MDL
PCBs	<MDL
As	2,590
Ba	61,900
Cd	360
Cr	6,130
Cu	13,900
Pb	61,300
Hg	645
Se	<MDL
Ag	<MDL
Zn	49,100

A-9	
12/08/2015	
1.0 - 2.0'	
2-M	300
OTHER VOCs	<MDL
B(a)ANTH	630
B(a)PYR	700
B(b)FLA	1,270
B(k)FLA	1,350
B(g,h,i)PER	360
CHRYSENE	630
FL	1,270
I(1,2,3-CD)PY	350
Ph	360
Py	1,050
OTHER PNAs	<MDL
PCBs	<MDL
As	2,050
Ba	40,900
Cd	330
Cr	3,540
Cu	8,210
Pb	38,500
Hg	142
Se	<MDL
Ag	<MDL
Zn	84,700

SB-14	
12/07/2015	
1.0 - 2.0'	
VOCs	<MDL
B(a)ANTH	510
B(a)PYR	500
B(b)FLA	910
B(k)FLA	970
B(g,h,i)PER	330
CHRYSENE	550
FL	1,200
Ph	580
Py	870
OTHER PNAs	<MDL
PCBs	<MDL
As	1,940
Ba	24,700
Cd	270
Cr	6,110
Cu	5,390
Pb	27,200
Hg	414
Se	<MDL
Ag	<MDL
Zn	32,400

SB-16	
12/07/2015	
1.0 - 2.0'	
VOCs	<MDL
ANT	530
B(a)ANTH	1,550
B(a)PYR	1,560
B(b)FLA	2,800
B(k)FLA	2,980
B(g,h,i)PER	880
CHRYSENE	1,660
FL	3,600
I(1,2,3-CD)PY	880
Ph	1,870
Py	2,730
OTHER PNAs	<MDL
PCBs	<MDL
As	860
Ba	16,500
Cd	300
Cr	2,640
Cu	4,350
Pb	57,700
Hg	762
Se	<MDL
Ag	<MDL
Zn	29,200

SB-18	
12/07/2015	
7.0 - 8.0'	
2-M	200
NAPH	700
TRICLFL METH	1,200
OTHER VOCs	<MDL
ACE	800
ANT	1,890
B(a)ANTH	4,850
B(a)PYR	4,680
B(b)FLA	8,750
B(k)FLA	9,310
B(g,h,i)PER	2,300
CHRYSENE	5,370
DI(A,H)ANT	750
FL	12,640
F	740
I(1,2,3-CD)PY	2,420
Ph	7,120
Py	9,110
OTHER PNAs	<MDL
PCBs	<MDL
As	2,850
Ba	49,500
Cd	440
Cr	8,770
Cu	10,600
Pb	65,200
Hg	628
Se	<MDL
Ag	<MDL
Zn	80,500

A-3	
12/07/2015	
7.0 - 8.0'	
2-M	200
NAPH	800
TRICLFL METH	800
OTHER VOCs	<MDL
ACE	560
ANT	1,030
B(a)ANTH	2,760
B(a)PYR	2,700
B(b)FLA	4,970
B(k)FLA	5,300
B(g,h,i)PER	1,310
CHRYSENE	3,020
DI(A,H)ANT	550
FL	7,110
F	450
I(1,2,3-CD)PY	1,310
Ph	4,000
Py	5,280
OTHER PNAs	<MDL
PCBs	<MDL
As	2,400
Ba	54,700
Cd	420
Cr	6,430
Cu	9,030
Pb	56,400
Hg	394
Se	<MDL
Ag	<MDL
Zn	93,200

WEST EIGHT MILE ROAD

7429-7745 WEST EIGHT MILE ROAD
 COMMERCIAL PROPERTIES

FORMER HEATING OIL USTs
 (2) 10,000-GALLON AND
 (1) 1,000-GALLON

SB-30	
3/1/2016	
8.0 - 9.0'	
VOCs	<MDL
PNAs	<MDL
SVOCs	<MDL
PCBs	<MDL

SB-20	
12/07/2015	
1.0 - 2.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	510
Ba	10,800
Cd	<MDL
Cr	2,680
Cu	2,650
Pb	5,050
Hg	<MDL
Se	<MDL
Ag	<MDL
Zn	6,170

140 PINECREST DRIVE
 GASOLINE DISPENSING STATION

SB-31	
3/1/2016	
7.0 - 8.0'	
VOCs	<MDL
PNAs	<MDL
SVOCs	<MDL
PCBs	<MDL

SB-32	
3/1/2016	
8.0 - 9.0'	
VOCs	<MDL
PNAs	<MDL
SVOCs	<MDL
PCBs	<MDL



FIGURE 5B
 SOIL BORING/TEMPORARY MONITORING WELL AND
 MONITORING WELL LOCATION MAP WITH
 SOUTHERN SOIL ANALYTICAL RESULTS

PROJ: COMMERCIAL AND VACANT LAND
 1600 WEST 8 MILE ROAD
 FERNDALE, MI

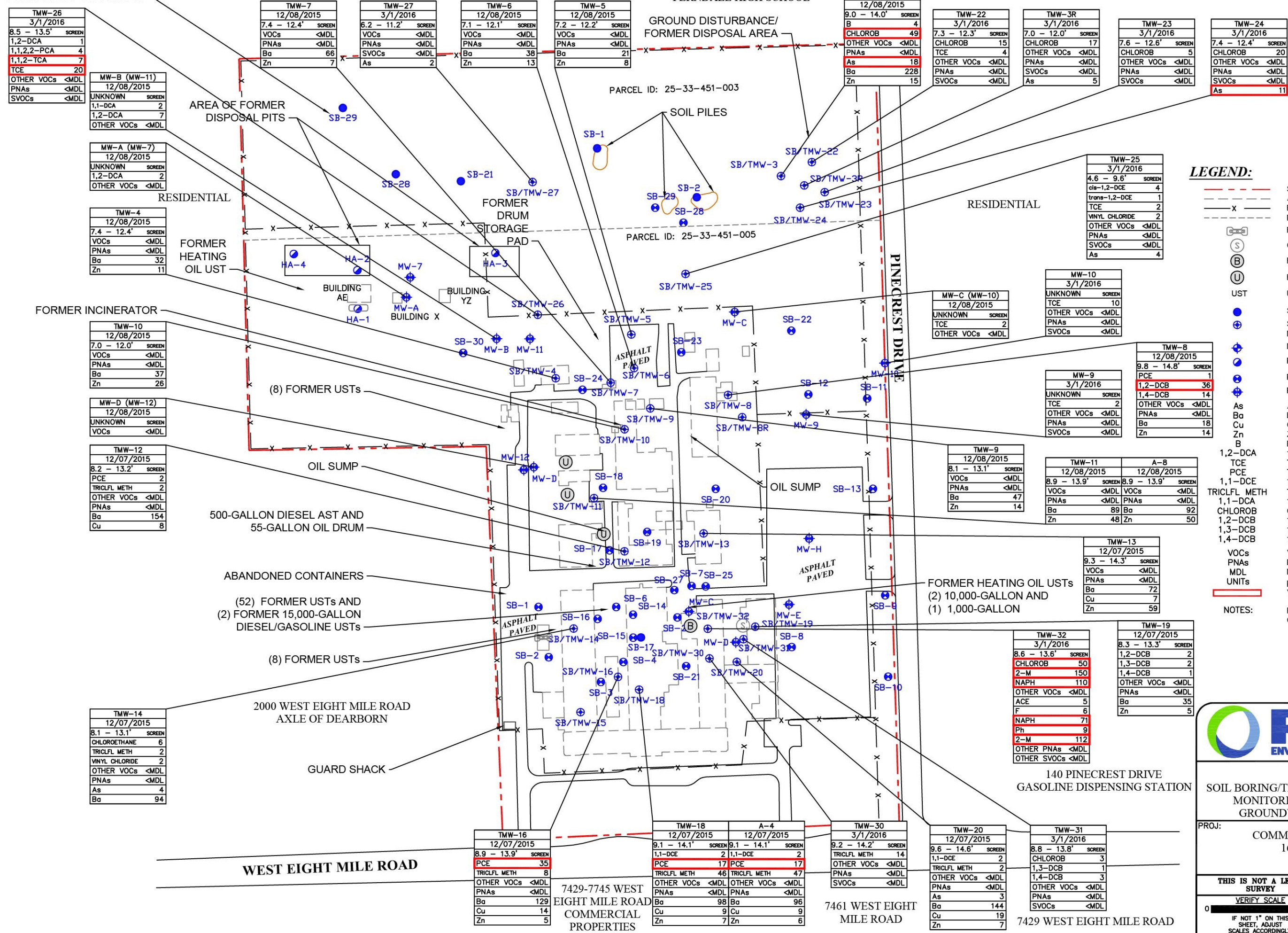
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 CHKD BY: LS/JA
 FILE NAME: 01-6124-1-001F00R00

DATE: 6/17/2016
 SCALE: 1" = 200'

GROUND DISTURBANCE/
FORMER DISPOSAL AREA

881 PINECREST DRIVE
FERNDALE HIGH SCHOOL



LEGEND:

- SUBJECT PROPERTY
 - - - APPROXIMATE FORMER/HISTORICAL SITE FEATURE
 - - - FENCE
 - - - PARCEL / LOT BOUNDARIES
 - FORMER FUEL DISPENSER
 - COLLECTION SUMP
 - FORMER BOILER ROOM
 - FORMER UST
 - UNDERGROUND STORAGE TANK
 - SOIL BORING
 - ⊕ SOIL BORING / TEMPORARY MONITORING WELL
 - ⊕ MONITORING WELL
 - ⊕ PREVIOUS 2012 RJN SOIL BORING
 - ⊕ PREVIOUS SOIL BORING
 - ⊕ PREVIOUS MONITORING WELL
 - As ARSENIC
 - Ba BARIUM
 - Cu COPPER
 - Zn ZINC
 - B BENZENE
 - 1,2-DCA 1,2-DICHLOROETHANE
 - TCE TRICHLOROETHENE
 - PCE TETRACHLOROETHENE
 - 1,1-DCE 1,1-DICHLOROETHYLENE
 - TRICLFL METH TRICHLOROFLUOROMETHANE
 - 1,1-DCA 1,1-DICHLOROETHANE
 - CHLOROB CHLOROBENZENE
 - 1,2-DCB 1,2-DICHLOROBENZENE
 - 1,3-DCB 1,3-DICHLOROBENZENE
 - 1,4-DCB 1,4-DICHLOROETHANE
 - VOCs VOLATILE ORGANIC COMPOUNDS
 - PNAs POLYNUCLEAR AROMATIC COMPOUNDS
 - MDL METHOD DETECTION LIMIT
 - UNITS μg/L (UNLESS NOTED)
 - VALUE EXCEEDS CRITERIA
- NOTES: REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED



FIGURE 6
SOIL BORING/TEMPORARY MONITORING WELL AND
MONITORING WELL LOCATION MAP WITH
GROUNDWATER ANALYTICAL RESULTS

PROJ: COMMERCIAL AND VACANT LAND
1600 WEST 8 MILE ROAD
FERNDALE, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: CS/ES	DATE: 6/17/2016
VERIFY SCALE	CHKD BY: LS/JA	SCALE: 1" = 180'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.		
FILE NAME: 01-6124-1-001F00R00		

Tables

TABLE 1A
SUMMARY OF 2015/2016 SOIL ANALYTICAL RESULTS
VOCs
1600 WEST EIGHT MILE ROAD, FERNDALE, MICHIGAN
PM PROJECT #01-6124-1-0001

VOLATILE ORGANIC COMPOUNDS (VOCs) (µg/Kg)			2-Methylnaphthalene	Naphthalene	Trichloroethylene	Trichlorofluoromethane	Other VOCs
Chemical Abstract Service Number (CAS#)			91576	91203	79016	75694	Various
Sample ID	Sample Date	Sample Depth (feet bgs)	VOCs				
SB-1	12/8/2015	5.0-6.0	<100	<400	<70	<100	<MDL
SB-2	12/8/2015	3.0-4.0	<100	<300	<60	<100	<MDL
SB-3R	3/1/2016	3.0-4.0	<100	<400	<70	<100	<MDL
SB-4	12/8/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-5	12/8/2015	1.0-2.0	<100	<400	<70	<100	<MDL
SB-7	12/8/2015	8.0-9.0	<100	<400	<70	<100	<MDL
SB-8	12/8/2015	1.0-2.0	<100	<300	<70	<100	<MDL
SB-9	12/8/2015	1.0-2.0	<100	<400	<70	<100	<MDL
SB-10	12/8/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-11	12/8/2015	1.0-2.0	<100	<300	<60	<100	<MDL
A-9			300	<300	<70	<100	<MDL
SB-12	12/7/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-13	12/7/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-14	12/7/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-15	12/7/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-16	12/7/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-17	12/7/2015	1.0-2.0	200	400	<60	<100	<MDL
SB-18	12/7/2015	7.0-8.0	200	700	<70	1,200	<MDL
A-3			200	800	<70	800	<MDL
SB-19	12/7/2015	1.0-2.0	<100	<300	60	<100	<MDL
SB-20	12/7/2015	1.0-2.0	<100	<300	<60	<100	<MDL
SB-21	12/8/2015	8.0-9.0	<200	<400	<80	<200	<MDL
SB-22	3/1/2016	3.0-4.0	<100	<300	<70	<100	<MDL
SB-23	3/1/2016	4.0-5.0	<100	<300	<60	<100	<MDL
SB-24	3/1/2016	3.0-4.0	<100	<300	<70	<100	<MDL
SB-25	3/1/2016	4.0-5.0	<200	<400	220	<200	<MDL
SB-26	3/1/2016	2.0-3.0	<100	<300	<70	<100	<MDL
SB-27	3/1/2016	4.0-5.0	2,300	5,200	<70	<100	<MDL
SB-28	3/1/2016	3.0-4.0	<6,000	<20,000	<3,000	<6,000	<MDL
SB-29	3/1/2016	1.0-2.0	<100	<300	<60	<100	<MDL
SB-30	3/1/2016	8.0-9.0	<100	<300	<60	<100	<MDL
SB-31	3/1/2016	7.0-8.0	<100	<300	<60	<100	<MDL
SB-32	3/1/2016	8.0-9.0	<100	<300	<60	<100	<MDL
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013							
Residential (µg/Kg)							
Drinking Water Protection (Res DWP)	57,000	35,000	100	52,000	Various		
Groundwater Surface Water Interface Protection (GSIP)	4,200	730	4,000 (X)	NA	Various		
Soil Volatilization to Indoor Air Inhalation (Res SVII)	2.70E+06	2.50E+05	1,000	2.8E+06 (C)	Various		
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)	1.50E+06	3.00E+05	11,000	9.20E+07	Various		
Ambient Air Finite VSI for 5 Meter Source Thickness	1.50E+06	3.00E+05	25,000	6.30E+08	Various		
Ambient Air Finite VSI for 2 Meter Source Thickness	1.50E+06	3.00E+05	57,000	1.50E+09	Various		
Ambient Air Particulate Soil Inhalation (Res PSI)	6.70E+08	2.00E+08	1.30E+08	3.80E+12	Various		
Direct Contact (Res DC)	8.10E+06	1.60E+07	5.0E+5 (C,DD)	7.9E+07 (C)	Various		
Nonresidential (µg/Kg)							
Drinking Water Protection (Nonres DWP)	1.70E+05	1.00E+05	100	1.50E+05	Various		
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)	4.90E+06	4.70E+05	1,900	5.1E+06 (C)	Various		
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)	1.80E+06	3.50E+05	14,000	1.10E+08	Various		
Ambient Air Finite VSI for 5 Meter Source Thickness	1.80E+06	3.50E+05	25,000	1.40E+11	Various		
Ambient Air Finite VSI for 2 Meter Source Thickness	1.80E+06	3.50E+05	58,000	1.40E+11	Various		
Ambient Air Particulate Soil Inhalation (Nonres PSI)	2.90E+08	8.80E+07	5.90E+07	1.70E+12	Various		
Direct Contact (Nonres DC)	2.60E+07	5.20E+07	6.6E+05 (C,DD)	2.6E+08 (C)	Various		
Screening Levels (µg/Kg)							
Soil Saturation Concentration Screening Levels (Csat)	NA	NA	5.00E+05	5.60E+05	Various		

 Criterion/RBSL Exceeded
BOLD Value Exceeds Applicable Criterion/RBSL
 bgs Below Ground Surface (feet)
 MDL Laboratory method detection limit (MDL)
 NA Not Applicable
 NL Not Listed
 NLL Not Likely to Leach
 NLV Not Likely to Volatilize
 ID Insufficient Data

TABLE 3A
SUMMARY OF 2015/2016 SOIL ANALYTICAL RESULTS
PCBs AND METALS
1600 WEST EIGHT MILE ROAD, FERNDALE, MICHIGAN
PM PROJECT #01-6124-1-0001

POLYCHLORINATED BIPHENYLS (PCBs) AND METALS (µg/Kg)			PCBs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
Chemical Abstract Service Number (CAS#)			1336363	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666
Sample ID	Sample Date	Sample Depth (feet bgs)	PCBs	Michigan Ten Metals									
SB-1	12/8/2015	5.0-6.0	<330	2,560	67,900	<200	11,300	9,980	5,760	<50	<400	<200	26,700
SB-2	12/8/2015	3.0-4.0	<330	3,260	42,500	210	12,000	15,800	13,800	67	<400	<200	45,400
SB-3R	3/1/2016	3.0-4.0	<330	5,220	NA	NA	NA	NA	125,000	76	NA	NA	NA
SB-4	12/8/2015	1.0-2.0	<330	2,140	33,900	610	19,800	7,260	35,900	115	<400	<200	37,100
SB-5	12/8/2015	1.0-2.0	<330	1,480	18,000	220	2,620	1,670	6,550	<50	<400	<200	13,600
SB-7	12/8/2015	8.0-9.0	<330	210	9,310	<200	1,220	1,390	1,370	<50	<400	<200	3,180
SB-8	12/8/2015	1.0-2.0	<330	450	10,800	<200	2,080	1,750	3,890	65	<400	<200	4,030
SB-9	12/8/2015	1.0-2.0	<330	970	23,600	410	4,840	5,240	26,100	87.8	<400	<200	27,300
SB-10	12/8/2015	1.0-2.0	<330	340	7,030	<200	2,370	2,640	7,850	<50	<400	310	12,900
SB-11	12/8/2015	1.0-2.0	<330	2,590	61,900	360	6,130	13,900	61,300	645	<400	<200	49,100
A-9	12/8/2015	1.0-2.0	<330	2,050	40,900	330	3,540	8,210	38,500	142	<400	<200	84,700
SB-12	12/7/2015	1.0-2.0	<330	<200	9,630	<200	940	<500	3,260	<50	<400	<200	2,170
SB-13	12/7/2015	1.0-2.0	<330	270	3,750	<200	930	<500	1,460	54.7	<400	<200	2,270
SB-14	12/7/2015	1.0-2.0	<330	1,940	24,700	270	6,110	5,390	27,200	414	<400	<200	32,400
SB-15	12/7/2015	1.0-2.0	<330	580	9,230	<200	2,070	2,030	4,810	<50	<400	<200	7,530
SB-16	12/7/2015	1.0-2.0	<330	860	16,500	300	2,640	4,350	57,700	762	<400	<200	29,200
SB-17	12/7/2015	1.0-2.0	<330	1,060	29,600	290	4,020	6,200	23,300	291	<400	<200	38,500
SB-18	12/7/2015	1.0-2.0	<330	2,580	49,500	440	8,770	10,600	65,200	628	<400	<200	80,500
A-3	12/7/2015	7.0-8.0	<330	2,400	54,700	420	6,430	9,030	56,400	394	<400	<200	93,200
SB-19	12/7/2015	1.0-2.0	<330	1,130	19,700	<200	4,290	5,010	10,100	<50	<400	<200	13,200
SB-20	12/7/2015	1.0-2.0	<330	510	10,800	<200	2,680	2,650	5,050	<50	<400	<200	6,170
SB-21	12/8/2015	8.0-9.0	<330	1,790	43,300	220	6,360	9,220	26,700	<50	<400	<200	32,400
SB-22	3/1/2016	3.0-4.0	<330	5,580	NA	NA	NA	NA	145,000	621	NA	NA	NA
SB-23	3/1/2016	4.0-5.0	<330	2,480	NA	NA	NA	NA	52,500	84	NA	NA	NA
SB-24	3/1/2016	3.0-4.0	<330	1,930	NA	NA	NA	NA	21,200	102	NA	NA	NA
SB-25	3/1/2016	4.0-5.0	<330	20,800	NA	NA	NA	NA	207,000	64	NA	NA	NA
SB-26	3/1/2016	2.0-3.0	<330	810	NA	NA	NA	NA	28,200	<50	NA	NA	NA
SB-27	3/1/2016	4.0-5.0	<330	6,580	NA	NA	NA	NA	223,000	662	NA	NA	NA
SB-28	3/1/2016	3.0-4.0	<330	3,510	NA	NA	NA	NA	7,360	<50	NA	NA	NA
SB-29	3/1/2016	1.0-2.0	<330	6,980	NA	NA	NA	NA	7,490	<50	NA	NA	NA
SB-30	3/1/2016	8.0-9.0	<330	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-31	3/1/2016	7.0-8.0	<330	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-32	3/1/2016	8.0-9.0	<330	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013													
Residential (µg/Kg)													
Statewide Default Background Levels	NA	5,800	75,000	1,200	18,000	32,000	21,000	130	410	1,000	47,000		
Drinking Water Protection (Res DWP)	NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	2.40E+06		
Groundwater Surface Water Interface Protection (GSIP)	NLL	4,600	8.2E+05 (G)	5,600 (G,X)	4.8E+09 (G)	1.2E+05 (G)	5.2E+06 (G,X)	50 (M); 1.2	400	100 (M); 27	2.7E+05 (G)		
Soil Volatilization to Indoor Air Inhalation (Res SVII)	3.0E+06	NLV	NLV	NLV	NLV	NLV	NLV	48,000	NLV	NLV	NLV		
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)	2.40E+05	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 5 Meter Source Thickness	7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 2 Meter Source Thickness	7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV		
Ambient Air Particulate Soil Inhalation (Res PSI)	5.2E+06	7.20E+05	3.30E+08	1.70E+06	2.60E+05	1.30E+08	1.00E+08	2.00E+07	1.30E+08	6.70E+06	ID		
Direct Contact (Res DC)	(T)	7,600	3.70E+07	5.50E+05	2.50E+06	2.00E+07	4.00E+05	1.60E+05	2.60E+06	2.50E+06	1.70E+08		
Nonresidential (µg/Kg)													
Drinking Water Protection (Nonres DWP)	NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	5.00E+06		
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)	1.6E+07	NLV	NLV	NLV	NLV	NLV	NLV	89,000	NLV	NLV	NLV		
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)	8.10E+05	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 5 Meter Source Thickness	2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 2 Meter Source Thickness	2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV		
Ambient Air Particulate Soil Inhalation (Nonres PSI)	6.5E+06	9.10E+05	1.50E+08	2.20E+06	2.40E+05	5.90E+07	4.40E+07	8.80E+06	5.90E+07	2.90E+06	ID		
Direct Contact (Nonres DC)	(T)	37,000	1.30E+08	2.10E+06	9.20E+06	7.30E+07	9.0E+5 (DD)	5.80E+05	9.60E+06	9.00E+06	6.30E+08		
Screening Levels (µg/Kg)													
Soil Saturation Concentration Screening Levels (Csat)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

 Criterion/RBSL Exceeded
BOLD Value Exceeds Applicable Criterion/RBSL
 bgs Below Ground Surface (feet)
 MDL Laboratory method detection limit (MDL)
 NA Not Applicable
 NL Not Listed
 NLL Not Likely to Leach
 NLV Not Likely to Volatilize
 ID Insufficient Data

(G) Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 269 mg/L CaCO3 Hardness: Station ID 500011, Red Run Drain, near Warren, MI.

TABLE 3A
SUMMARY OF 2015/2016 SOIL ANALYTICAL RESULTS
PCBs AND METALS
1600 WEST EIGHT MILE ROAD, FERNDALE, MICHIGAN
PM PROJECT #01-6124-1-0001

POLYCHLORINATED BIPHENYLS (PCBs) AND METALS (µg/Kg)			PCBs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
Chemical Abstract Service Number (CAS#)			1336363	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666
Sample ID	Sample Date	Sample Depth (feet bgs)	PCBs	Michigan Ten Metals									
SB-1	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-2	10/4/2012	8.0-10.0	NS	540	4,200	<MDL	3,400	2,700	2,700	<MDL	<MDL	<MDL	8,000
SB-3	10/4/2012	10.0-12.0	<MDL	11,000	19,000	<MDL	4,900	4,000	9,800	50	220	<MDL	18,000
SB-4	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-5	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-6	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-7	10/4/2012	10.0-12.0	<MDL	380	7,600	<MDL	3,400	1,300	<MDL	<MDL	<MDL	<MDL	9,800
SB-8	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-9	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	10/4/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-11	10/5/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-12	10/5/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-14	10/5/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-16	10/5/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-17	10/5/2012	10.0-12.0	NS	340	6,900	<MDL	3,300	1,400	1,800	<MDL	260	<MDL	9,200
SB-18	10/5/2012	6.0-8.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-19	10/5/2012	8.0-10.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-20	10/5/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-21	10/5/2012	10.0-12.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-22	10/5/2012	8.0-10.0	<MDL	420	12,000	<MDL	4,500	3,900	3,800	1.9	260	<MDL	12,000
SB-23	10/5/2012	8.0-10.0	<MDL	690	5,000	<MDL	3,600	3,500	3,200	<MDL	350	<MDL	9,300
SB-24	10/8/2012	8.0-10.0	<MDL	560	9,700	<MDL	3,600	2,000	2,800	<MDL	400	<MDL	9,700
SB-25	10/8/2012	10.0-12.0	<MDL	700	6,600	<MDL	2,900	2,600	7,900	<MDL	220	<MDL	7,900
SB-26	10/8/2012	12.0-14.0	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS
SB-27	10/8/2012	10.0-12.0	<MDL	630	11,000	<MDL	5,200	3,100	12,000	8.4	320	<MDL	13,000
SB-28	10/8/2012	10.0-12.0	NS	220	5,500	<MDL	3,200	870	<MDL	<MDL	300	<MDL	9,800
SB-29	10/8/2012	10.0-12.0	NS	2,000	13,000	<MDL	4,800	4,400	7,000	0.8	350	<MDL	21,000
SB-30	10/8/2012	10.0-12.0	NS	240	8,500	<MDL	5,100	5,500	3,300	<MDL	<MDL	<MDL	14,000
HA1	10/8/2012	8.0	NS	1,300	13,000	<MDL	7,200	3,800	5,600	5.6	<MDL	<MDL	18,000
HA2	10/8/2012	8.0	NS	1,300	9,900	<MDL	6,200	3,600	6,500	8.8	<MDL	<MDL	12,000
HA3	10/8/2012	8.0	NS	1,900	24,000	<MDL	8,200	6,200	17,000	15	320	<MDL	33,000
HA4	10/8/2012	8.0	NS	3,200	11,000	<MDL	5,300	5,200	7,000	38	380	<MDL	38,000
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013													
Residential (µg/Kg)													
Statewide Default Background Levels	NA	5,800	75,000	1,200	18,000	32,000	21,000	130	410	1,000	47,000		
Drinking Water Protection (Res DWP)	NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	2.40E+06		
Groundwater Surface Water Interface Protection (GSIP)	NLL	4,600	8.2E+05 (G)	5,600 (G,X)	4.8E+09 (G)	1.2E+05 (G)	5.2E+06 (G,X)	50 (M); 1.2	400	100 (M); 27	2.7E+05 (G)		
Soil Volatilization to Indoor Air Inhalation (Res SVII)	3.0E+06	NLV	NLV	NLV	NLV	NLV	NLV	48,000	NLV	NLV	NLV		
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)	2.40E+05	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 5 Meter Source Thickness	7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 2 Meter Source Thickness	7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV		
Ambient Air Particulate Soil Inhalation (Res PSI)	5.2E+06	7.20E+05	3.30E+08	1.70E+06	2.60E+05	1.30E+08	1.00E+08	2.00E+07	1.30E+08	6.70E+06	ID		
Direct Contact (Res DC)	(T)	7,600	3.70E+07	5.50E+05	2.50E+06	2.00E+07	4.00E+05	1.60E+05	2.60E+06	2.50E+06	1.70E+08		
Nonresidential (µg/Kg)													
Drinking Water Protection (Nonres DWP)	NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	5.00E+06		
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)	1.6E+07	NLV	NLV	NLV	NLV	NLV	NLV	89,000	NLV	NLV	NLV		
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)	8.10E+05	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 5 Meter Source Thickness	2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV		
Ambient Air Finite VSI for 2 Meter Source Thickness	2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV		
Ambient Air Particulate Soil Inhalation (Nonres PSI)	6.5E+06	9.10E+05	1.50E+08	2.20E+06	2.40E+05	5.90E+07	4.40E+07	8.80E+06	5.90E+07	2.90E+06	ID		
Direct Contact (Nonres DC)	(T)	37,000	1.30E+08	2.10E+06	9.20E+06	7.30E+07	9.0E+5 (DD)	5.80E+05	9.60E+06	9.00E+06	6.30E+08		
Screening Levels (µg/Kg)													
Soil Saturation Concentration Screening Levels (Csat)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

 Criterion/RBSL Exceeded
BOLD Value Exceeds Applicable Criterion/RBSL
 bgs Below Ground Surface (feet)
 MDL Laboratory method detection limit (MDL)
 NA Not Applicable
 NL Not Listed
 NLL Not Likely to Leach
 NLV Not Likely to Volatilize
 ID Insufficient Data

(G) Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 269 mg/L CaCO₃ Hardness: Station ID 500011, Red Run Drain, near Warren, MI.

TABLE 5
SUMMARY OF 2015 GROUNDWATER ANALYTICAL RESULTS
VOCs, SVOCs, AND METALS
1600 WEST EIGHT MILE ROAD, FERNDALE, MICHIGAN
PM PROJECT #01-6124-1-0001

VOLATILE ORGANIC COMPOUNDS (VOCs), SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs), AND METALS (µg/L)				Chlorobenzene	1,1-Dichloroethane	1,2-Dichloroethane	Tetrachloroethylene	1,1,2-Trichloroethane	Trichloroethylene	1,2-Dichlorobenzene	Other VOCs	Diethyl Phthalate	Other SVOCs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
Chemical Abstract Service Number (CAS#)				108907	75343	107062	127184	79005	79016	95501	Various	84862	Various	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666
Sample ID	Sample Date	Screen Depth (feet bgs)	Depth to Groundwater (feet bgs)	VOCs								SVOCs		Michigan Ten Metals									
MW7	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	5.1	<MDL	1.1	<MDL	<MDL	<MDL	<MDL	<MDL	9.8	160	<MDL	18	19	9.4	<MDL	1.4	<MDL	46
MW9	10/9/2012	Not Reported	Not Reported	1.3	<MDL	<MDL	<MDL	<MDL	11	<MDL	<MDL	<MDL	<MDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW10	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	<MDL	<MDL	22	<MDL	<MDL	<MDL	<MDL	<MDL	190	<MDL	<MDL	3.2	<MDL	<MDL	<MDL	<MDL	
MW11	10/9/2012	Not Reported	Not Reported	<MDL	2.7	9.4	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	85	<MDL	<MDL	<MDL	<MDL	<MDL	1.0	<MDL	<MDL
MW12	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	94	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	
MW-A	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2.5	<MDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
MW-D	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	
MW-E	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	1.5	<MDL	<MDL	<MDL	<MDL	4.6	<MDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	
MW-G	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	
MW-H	10/9/2012	Not Reported	Not Reported	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) Generic Groundwater Cleanup Criteria Table 1: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013 MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013																							
Residential/Nonresidential (µg/L)																							
Residential Drinking Water (Res DW)	100 (A)	880	5.0 (A)	5.0 (A)	5.0 (A)	5.0 (A)	600 (A)	Various	5,500	Various	10 (A)	2,000 (A)	5.0 (A)	100 (A)	1,000 (E)	4.0 (L)	2.0 (A)	50 (A)	34	2,400			
Nonresidential Drinking Water (Nonres DW)	100 (A)	2,500	5.0 (A)	5.0 (A)	5.0 (A)	5.0 (A)	600 (A)	Various	16,000	Various	10 (A)	2,000 (A)	5.0 (A)	100 (A)	1,000 (E)	4.0 (L)	2.0 (A)	50 (A)	98	5,000 (E)			
Groundwater Surface Water Interface (GSI)	25	740	360 (X)	60 (X)	330 (X)	200 (X)	13	Various	110	Various	10	1,300 (G)	4.6 (G,X)	170 (G)	21 (G)	30 (G,X)	0.0013	5.0	0.2 (M); 0.06	270 (G)			
Residential Groundwater Volatilization to Indoor Air Inhalation (Res GVII) ²	2.10E+05	1.00E+06	9,600	25,000	17,000	2,200	1.6E+5 (S)	Various	NLV	Various	NLV	NLV	NLV	NLV	NLV	NLV	NLV	56 (S)	NLV	NLV	NLV		
Nonresidential Groundwater Volatilization to Indoor Air Inhalation (Nonres GVII) ²	4.7E+5 (S)	2.30E+06	59,000	1.70E+05	1.10E+05	4,900	1.6E+5 (S)	Various	NLV	Various	NLV	NLV	NLV	NLV	NLV	NLV	NLV	56 (S)	NLV	NLV	NLV		
Screening Levels (µg/L)																							
Residential Groundwater Vapor Intrusion Screening Levels (GW _{V1-res}) ³	1,100	4,300	41	94	96	9.8	7,600	Various	NL	Various	NL	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL		
Nonresidential Groundwater Vapor Intrusion Screening Levels (GW _{V1-nr}) ³	4,600	18,000	210	460	480	41	32,000	Various	NL	Various	NL	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL		
Water Solubility	4.72E+05	5.06E+06	8.52E+06	2.00E+05	4.42E+06	1.10E+06	1.56E+05	Various	1.08E+06	Various	NA	NA	NA	NA	NA	NA	NA	56	NA	NA	NA		
Flammability and Explosivity Screening Level	1.60E+05	3.80E+05	2.50E+06	ID	NA	ID	NA	Various	ID	Various	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID		

Criteria/RBSL Exceeded

BOLD Value Exceeds Applicable Criteria

bgs Below Ground Surface (feet)

ND Not detected at levels above the laboratory Method Detection Limit (MDL) or Minimum Quantitative Level (MQL)

¹ Rule 323.1057 of Part 4 Water Quality Standards

² Tier 1 GVII Criteria based on 3 meter (or greater) groundwater depth

³ (2013 Vapor Intrusion Guidance) Screening Levels based on depth to groundwater less than 1.5 meters and not in contact with building foundation

NA Not Applicable

NL Not Listed

NLL Not Likely to Leach

NLV Not Likely to Volatilize

ID Insufficient Data

(G) Metal GSI Criteria for Surface Water Not Protected for Drinking Water Use based on 269 mg/L CaCO3 Hardness: Station ID 500011, Red Run Drain, near Warren, MI.

Appendix A





Environmental & Engineering Services Nationwide



ENVIRONMENTAL SERVICES

BUILDING ARCHITECTURE,
ENGINEERING & SCIENCE

INDUSTRIAL HYGIENE SERVICES

BROWNFIELDS & ECONOMIC
INCENTIVES CONSULTING

PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE

1600 West 8 Mile Road | Ferndale, Michigan
PM Project Number 01-6124-1-0002

Prepared for:

CG Emerson Real Estate Group
47 Oxford Road
Grosse Pointe, Michigan 48236

Prepared by:

PM Environmental, Inc.
4080 West 11 Mile Road
Berkley, Michigan 48072

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June 16, 2016

Mr. Greg Cooksey
Pinecrest Holdings, LLC
47 Oxford Road
Grosse Pointe, Michigan 48236

**Re: Phase I Environmental Site Assessment Update of the Vacant Industrial Property
Located at 1600 West 8 Mile Road, Ferndale, Michigan
PM Environmental, Inc. Project No. 01-6124-1-0002**

Dear Mr. Cooksey:

PM Environmental, Inc. (PM) has completed the Phase I Environmental Site Assessment (ESA) Update of the above referenced property. This Phase I ESA Update was conducted in general accordance with (1) the United States Environmental Protection Agency (USEPA) Standards and Practices for All Appropriate Inquiries {(AAI), 40 CFR Part 312} and (2) Section 4.6 of the guidelines established by the American Society for Testing and Materials (ASTM) in the *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process / Designation E 1527-13* (ASTM Standard Practice E 1527-13).

The purpose of the Phase I ESA Update was to gather sufficient information to develop an independent professional opinion about the environmental condition of the property.

The Phase I ESA Update for the above referenced property represents the product of PM's professional expertise and judgment in the environmental consulting industry, and it is reasonable for **CG EMERSON REAL ESTATE GROUP, EMERSON CONSULTING LLC, PINECREST HOLDINGS LLC, AND CEDAN HOLDINGS VI, LLC** to rely on PM's Phase I ESA Update report.

If you have any questions related to this report please do not hesitate to contact our office at (248) 336-9988.

Sincerely,
PM ENVIRONMENTAL, INC.

Andrea Magar
Project Consultant

Beth Sexton
National Due Diligence Manager

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- Figure 1: Site Location Map
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APPENDICES

- Appendix A: Property Photographs from Site Reconnaissance
Appendix B: Previous Site Investigation(s)
Appendix C: Correspondence and Supporting Documentation
Appendix D: Regulatory Database and File Review Correspondence
Appendix E: Professional Resumes
Appendix F: Acronyms and Terminology, Scope of Work, ASTM Reference Document, and User's Continuing Obligations under CERCLA

1.0 INTRODUCTION

PM Environmental, Inc., (PM) was retained to conduct a Phase I Environmental Site Assessment (ESA) Update of the Vacant Industrial Property located at 1600 West 8 Mile Road, Ferndale, Oakland County, Michigan (hereafter referred to as the “subject property”). This Phase I ESA Update was conducted in general accordance with Section 4.6 of the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I ESA Process (ASTM Designation: E-1527-13).

THIS REPORT WAS PREPARED FOR THE EXCLUSIVE USE OF CG EMERSON REAL ESTATE GROUP, EMERSON CONSULTING LLC, PINECREST HOLDINGS LLC, AND CEDAN HOLDINGS VI, LLC, EACH OF WHOM MAY RELY ON THE REPORT’S CONTENTS.

The purpose of this report is to update the information included in the Phase I ESA report completed by PM in November 2015. The previous report was completed in general accordance with the scope and limitations of the ASTM Standard Practice for Environmental Site Assessments: Phase I ESA Process (Designation: E-1527-13). The information provided in the previous Phase I ESA report sufficiently addressed conditions of the subject property from 2015 to 1937, at which time data failure occurred. In accordance with Section 4.6 of the ASTM Practice E-1527-13, the information provided in the previous report has been adopted for use in this update.

In accordance with Section 4.6 of the ASTM Practice E-1527-13, the minimum requirements for an update of a Phase I ESA include: 1) interviews with owners, operators, and occupants, 2) searches for recorded environmental cleanup liens, 3) review of federal, tribal, state, and local government records, 4) visual inspection of the subject property and of adjoining properties, and 5) the declaration by the environmental professional responsible for the update.

1.1: Limitations, Deviations, and Special Terms and Conditions

There are no deviations from the ASTM Standard. Any physical limitations identified during the completion of this report are referenced in Section 6.0.

Due to changing environmental regulatory conditions and potential on-site or adjacent activities occurring after this assessment, the client may not presume the continuing applicability to the subject property of the conclusions in this assessment for more than 180 days after the report’s issuance date, per ASTM Standard Practice E 1527-13.

To the best of PM’s knowledge, no special terms or conditions apply to the preparation of this Phase I ESA that would deviate the scope of work from the ASTM Standard Practice E 1527-13.

2.0 SUBJECT PROPERTY OVERVIEW

Subject Property Location/Address	1600 West 8 Mile Road, Ferndale, Oakland County, Michigan
Number of Parcels and Acreage	Two parcels totaling 33.93 acres
Number of Building(s) and Square Footage	No buildings or structures are present, except a 100 square foot guard house located in the southwestern portion of the property (formerly referred to as Building Q)
Current Property Use	Vacant industrial land; no current business operations
Current Zoning	M-1: Limited Industrial

The subject property location is depicted on Figure 1, Site Location Map. A diagram of the subject property and adjoining properties is included as Figure 2, Generalized Diagram of the Subject Property and Surrounding Area. A diagram of the historical layout of the property is included as Figure 3 and Figure 4. Photographs taken during the site reconnaissance are included in Appendix A.

3.0 PREVIOUS SITE INVESTIGATION(S)

PM reviewed the following previous environmental reports for the subject property. Relevant portions of the reports are included in Appendix B.

Name of Report	Date of Report	Company that Prepared Report
Health Department Correspondence (Magnetometer Survey)	1985-1986	Between Ethyl Corporation and Oakland County Health Division
Leaking Underground Storage Tank (LUST) Closure Report	4-3-1997	Swanson Environmental
Phase I ESA	11-27-2012	RJN Environmental
Baseline Environmental Assessment (BEA)	12-2-2012	RJN Environmental
Phase II ESA	12-18-2012	RJN Environmental
Phase II ESA	11-1-2013	RJN Environmental
Phase I ESA	11-3-2015	PM

3.1: Summary of Previous Environmental Reports

Health Department records document that Ethyl Corporation had offered to gift the subject property to Oakland County. The County Health Department performed an initial assessment of the property which included review of available information and a limited environmental study. The areas of concern identified were the former disposal areas and former underground storage tank (UST) basins. A magnetometer survey was completed on a 50 foot grid in portions of the northern, eastern, and central portions where dumping had reportedly occurred. Anomalies consistent with orphan USTs were detected. Limited groundwater samples were collected in the vicinity of former Building AE. Concentrations of toluene, tetrahydrofuran, and chloroform were detected in the groundwater; however, the results provided were estimations based on chromatography. The final results were not provided and additional work was not completed because Oakland County decided not to accept the property.

The subject property is a closed LUST site with one release reported in 1996 and unrestricted Tier I LUST closure granted in 1998. The release was associated with the former 15,000-gallon diesel/gasoline USTs installed in 1988. Approximately 90 cubic yards of soil was removed from the property. Analytical results detected methyl-tert-butyl-ether (MTBE); 1,2,4-trimethylbenzene (TMB); ethylbenzene; and ethylbenzene in soil and/or groundwater samples collected at the subject property above MDEQ Part 213 Drinking Water (DW)/Drinking Water Protection (DWP) and/or Groundwater Surface Water Interface (GSI)/Groundwater Surface Water Interface Protection (GSIP) Risk Based Screening Levels (RBSLs), which would require limited due care obligations. **Based on the closed Tier I Unrestricted Residential Closure and documented site assessment activities which were adequate to assess the former release from these USTs, PM has identified the closed LUST status as a CREC.**

A Phase I ESA was performed in 2012. At the time of the Phase I ESA, the property remained occupied by the majority of the former buildings, which were vacant. The Phase I ESA

summarized additional previous site investigations completed at the subject property between 1986 and 1998. According to the 2012 Phase I ESA, test pits were completed in 1986 in the vicinity of the magnetometer survey readings. No buried drums were reportedly encountered; however, fill material consisting of bricks, concrete, and asphalt was observed in these areas. Soil gas samples were also reportedly collected in 1986 in the former UST area; however, results and location of the samples was not provided. The Phase I documents that a release of fuel oil was observed during the removal of the two 10,000-gallon fuel oil USTs. Approximately 240 cubic yards of soil were removed at that time; however, contaminated soil remained in place due to the location of the building and utilities. During subsequent investigations to delineate the fuel oil plume, fuel oil was discovered in one of the monitoring wells. A 1,000-gallon heating oil additive UST was found and removed in 1995, which was located south of the 10,000-gallon fuel oil USTs and was believed to be the source of the fuel oil in the monitoring well. The Phase I ESA documents that the previous site investigations detected volatile organic compounds (VOCs) in the drinking water and soils at the subject property; however, no analytical results were provided. The Phase I ESA identified the following RECs:

- The subject property was historically occupied by Ethyl Corporation. Operations included the use of emissions laboratory, engine research, fuel blending, maintenance shops, and bulk chemical storage. These operations generally use hazardous substances and/or petroleum based products. The detail of the general storage, use and disposal of these chemicals is unknown.
- The subject property is listed as a former UST site, a closed LUST site, a former Hazardous Waste Site, a RCRA-Conditionally Exempt Small Quantity Generator (CESQG), a RCRA Corrective Action Site (CORRACTS), and a CERC-No Further Action Planned (NFRAP).
- There are three historical disposal areas identified on the subject property, located near the former building AE, north of former Buildings AB and AF, and the northern portion of the eastern parking area. The disposal areas were used to dispose of laboratory wastes including glassware and residues as well as reactive sodium compounds at various times between the 1930s and 1980s.
- Historical groundwater investigations have identified VOCs. The source of this plume has been reported to have been from the historical disposal pit located northwest of the former Building AE.
- Historical reports identified 72 USTs formerly located on the subject property. The bulk of the USTs were located in a tank farm located between the former Buildings B and C. Additionally, a single heating oil UST was located north of Building D and south of Building AE. A review of government records indicates the USTs have been removed. A release was reported in 1996 associated with the removal of a former gasoline UST, which was granted closure in 1998. The Closure report was not available. Due to lack of confirmation sampling data, the USTs have been identified as a REC.
- Former Building H was used for fuel blending and piped to Building C for engine testing. There was also a remote fill station west of Building B. The former piping areas is considered a REC.

- Review of historical reports documents releases of fuel oil from a former UST located north of Building D. Free product was recovered. Contamination reportedly remains.
- Historical reports document chemical storage in former Buildings I, L, V, and AF. In addition, former Building AN was stated to be utilized for casting aluminum. Additionally, a drum storage pad was located in the central portion of the property.
- A historical record documented a small amount of nuclear source material was located in the soundproofing room of former Building C. The US Nuclear Regulatory Commission terminated the license prior to 1985; however, indicated that there was no clear documentation to terminating the license. No additional information was available.

A Phase II was completed in 2012 to assess the above identified RECs. A total of 30 soil borings were advanced on the subject property and four hand augers were advanced in select areas of former disposal, some UST basins, and some select chemical storage areas. It should be noted that none of the borings were advanced within the footprint of the former buildings. Additionally, eleven existing monitoring wells were sampled. The soil and groundwater samples were analyzed for VOCs, polynuclear aromatic compounds (PNAs), semivolatile organic compound (SVOCs); polychlorinated biphenyls (PCBs), metals, or some combination thereof. During the sampling of a monitoring well located in the vicinity of former fuel oil USTs at Building D, six inches of heating oil was observed in the monitoring well. Analytical results indicated that various PNAs, VOCs, and metals were detected in soils above Part 213 GSIP and DWP RBSLs. Additionally, arsenic exceeded the Part 213 Direct Contact (DC) RBSLs and phenanthrene exceeded the Infinite Source Volatile Soil Inhalation Criteria (VSIC) and Finite VSIC RBSLs. No PCBs were detected. Analytical results for groundwater indicated that various VOCs and lead exceeded the Part 213 DW RBSLs. Based on these results, a BEA was completed.

A subsequent Phase II ESA was reportedly performed in which 15 soil borings and four hand augers were advanced and five of the monitoring wells were sampled; however, the information provided was from the previously discussed 2012 sampling event. The report recommends excavation of impacted soils within the known disposal areas.

PM completed a Phase I ESA completed for the subject property in November 2015. At the time of the Phase I ESA, the subject property consisted of vacant industrial land with a layout similar to the current layout. Standard and other historical sources reviewed during the Phase I ESA were able to document that the subject property was developed as a research and development facility for chemical additives for gasoline in 1937, with several buildings constructed at various times between the 1930s and 1980s. All of the buildings were demolished, except the current guard house (formerly Building Q), with the majority of the buildings being demolished between 2012 and 2013. Historical operations included the research and development facility from the 1930s until the 1980s, followed by manufacturing operations from the 1980s until 2012, and the property has been vacant since 2013. The following on-site RECs were identified, which have not been assessed and remain RECs:

- The subject property was occupied by a research and development facility for chemical additives for gasoline from the 1930s until the 1980s, followed by manufacturing operations from the 1980s until vacated in 2012. Based upon review of the previous subsurface investigations, soil and groundwater contamination is present which exceeds the current Part 201 Residential and Nonresidential Generic Cleanup Criteria. **Based on**

these analytical results, the subject property would be classified as a “facility,” as defined by Part 201 of P.A. 451 of the Michigan NREPA, as amended.

- Review of available information documents that laboratory wastes, residues, glassware, foundry sands, and containers were buried in the northern, central, and eastern portions of the subject property. The previous site investigations were not adequate to assess these former disposal areas. Review of Health Department records documents that 11 disposal pits were located in the vicinity of former Building AE, the majority of which were located east of the building; unmapped disposal areas were also reported to be present north of former Building AI and in the vicinity of the eastern parking lot from the 1930s through the 1980s. Additionally, review of aerial photographs document ground disturbance throughout the northern and/or central portion of the subject property during the 1930s through the 1970s. The previous site investigations were limited to two small areas north and northeast of former Building AE and in the vicinity of the eastern parking area. Contamination has been identified above MDEQ Part 201 Generic Cleanup Criteria (GCC) in the assessed portions of the disposal areas. Additionally, based on the operations of the site and the information provided, the potential exists for drums or potential explosive or reactive materials to have been buried. **Based on this information, the potential exists for additional contamination and/or potentially hazardous materials may be present below the subsurface.**
- The subject property formerly contained at least 78 USTs. The majority of the USTs were located within three UST farms, located west of former Building R, west of former Building B, and north of former Building H (in between former Buildings B and C). Additional USTs were located north of former Building D, south of former Building AE, and in the vicinity of former Buildings O, M, E, and F. The previous site investigations were not adequate to assess the USTs, with the exception of the two former 15,000-gallon gasoline/diesel USTs which were located west of former Building C and the 1,000-gallon fuel oil UST located south of former Building AE. Free product was found in a monitoring well located in the vicinity of the former 10,000-gallon heating oil USTs located in the vicinity of former Building D. One soil sample was collected west of former Building B to assess eight former USTs and gasoline dispensing operations; no soil and/or groundwater samples were collected to assess the USTs which were located in the central portion of the property including the UST farm formerly located west of former Building R; 54 USTs were located north of former Building H; however, only a few soil and groundwater samples were collected in this area. Based on the long time period of operations and the number of USTs identified, the potential exists for additional USTs to be present. Records reviewed document that heating oil USTs were not registered and/or thoroughly documented. Additionally, USTs outside of the three main UST farms were not well documented as to the location. The previous site investigations did not include GPR survey. **Based on this information, the potential exists for additional contamination and/or for orphan USTs to be present.**
- Historical operations included blending of fuels, foundry operations, service operations, maintenance operations, chemical storage, incinerator, and laboratory testing from the 1930s until the 1980s followed by manufacturing operations. The previous site investigations were not adequate to assess the historical operations. No soil and/or groundwater sampling was conducted within the building footprints, former chemical storage areas, oil sumps, foundry operations, machine shop operations, fuel blending

operations, service garage, and maintenance operations were also not adequately assessed. **Therefore, the potential exists for additional contamination to be present.**

RECs were also identified associated with historical ground disturbance at the north adjoining property and the former long term printing operations and known contamination at the west adjoining property, which have not been assessed and remain RECs. Refer to Sections 6.3 and 7.5.2 for additional information.

4.0 INTERVIEWS

Section 4.6 of the ASTM Practice E-1527-13 requires new interviews be completed with the owner, operators, and occupants of the subject property. The objective of completing interviews with knowledgeable site contacts is to obtain information about the uses and physical characteristics of the property.

Represents	Interviewed	Name and Title	Length of Time Associated with Subject Property	Comments
Current Property Owner	No	Mr. Greg Cooksey, the current owner	Since November 2015	Ms. Cooksey purchased the property in May 2015 and has no knowledge of the property except for the environmental reports provided.
Former Property Owner	Yes	Mr. Robert Jacobs, Attorney for the former owner	Unknown	PM previously interviewed Mr. Jacobs during the completion of the 2015 Phase I ESA. Mr. Jacobs stated the former property owner, Mr. Norbert Wiersziewski, passed away in 2014 but would have had no knowledge of the property except for the environmental reports provided.
Key Site Manager	No	Not applicable	Not applicable	The property is currently vacant; therefore, there is no key site manager.
Current Occupant(s)	No	Not applicable	Not applicable	The property is currently vacant; therefore, there is no current occupant.
Former Occupant(s)	No	Not applicable	Not applicable	Contact information for the former occupants was not reasonably ascertainable or provided by the User
Other(s)	No	Not applicable	Not applicable	No other relevant interviews were conducted as part of this Phase I ESA.

5.0 USER PROVIDED INFORMATION

The ASTM Standard defines a User as “the party seeking to use Practice E 1527 to complete an environmental site assessment. A User may include, without limitation, a potential purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager.” The User has specific obligations for completing a successful application of this practice as outlined in Section 6 of the ASTM Standard Practice E 1527-13.

In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Liability Relief and Brownfield’s Revitalization Act of 2001 (the “Brownfield’s Amendments”) (if desired), the User must provide certain information (if available) identified in the User Questionnaire to the environmental professional. Failure to provide this information could result in a determination that “all appropriate inquiry” is not complete.

The following responses were provided by the User.

Question	Response
Name of Preparer and User Entity	CG Emerson Real Estate Group; Pinecrest Holdings, LLC
Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law?	No
Are you aware of any Activity and Use Limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?	No
As the user of this ESA do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	No
Does the purchase price being paid for this property reasonably reflect the fair market value of the property?	Yes
If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?	Not applicable
Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example, as user:	
Do you know the past uses of the property?	No
Do you know of specific chemicals that are present or once were present at the property?	No
Do you know of spills or other chemical releases that have taken place at the property?	No
Do you know of any environmental cleanups that have taken place at the property?	No

Question	Response
As the user of this ESA, based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of contamination at the property?	No

6.0 SUBJECT PROPERTY RECONNAISSANCE

Reconnaissance Information	
PM Field Personnel:	Ms. Andrea Magar and Ms. Kristen King
Site Reconnaissance Date:	June 7, 2016
Escort:	PM was not escorted during the site reconnaissance
Limitations:	Observations limited by dense vegetation in the northern portion of the property. Based on historical sources, PM has not identified this limitation as a significant data gap.

6.1: Subject Property Observations

The subject property contains an approximately 100 square foot guard house and a mobile trailer which are located in the southwestern portion of the property. The guard house is partially finished with a plywood floor, cinderblock walls, and a drywall ceiling. The guard house is on a poured concrete foundation. The mobile trailer is finished with 12 inch by 12 inch vinyl floor tiles, wood panel walls, and drywall ceilings.

An asphalt parking lot is present in the southeastern portion of the property and piles of concrete and asphalt are present in the southern portion. The remainder of the property contains bare soil, overgrown vegetation, forested areas, and parking areas.

The following table summarizes the site observations. Affirmative responses are discussed in more detail following the table.

Category	Feature	Observed
Interior Equipment	Elevators	No
	Air Compressors	No
	Incinerators	No
	Waste Treatment Systems	No
	Presses/Stamping Equipment	No
	Press Pits	No
	Hydraulic Lifts or In-ground hoists	No
	Paint Booth	No
	Plating Tanks	No
	Lathes, Screw Machines, etc.	No
Aboveground Chemical or Other Waste Storage or Waste Streams	Aboveground Storage Tanks (ASTs)	No
	Drums, Barrels and/or Containers > 5 gallons	Yes
	Chip Hoppers	No
	Hazardous or Petroleum Waste Streams	No
Underground Chemical or Waste Storage, Drainage or Collection Systems	Underground Storage Tanks	No
	Fuel Dispensers	No
	Sumps or Cisterns	No
	Dry Wells	No

Category	Feature	Observed
	Oil/Water Separators	No
	Floor Drains, Trench Drains, etc.	No
	Pipeline Markers	No
Exterior Observations	Stressed Vegetation	No
	Stained Soil or Pavement	No
	Monitoring Wells	Yes
	Pad or Pole Mounted Transformers and/or Capacitors	No
	Soil Piles of Unknown Origin	No
	Exterior Dumpsters with Staining	No
	Leachate or Other Waste Seeps	No
	Trash, Debris, and/or Other Waste Materials	No
	Uncontrolled Dumping or Disposal Areas	No
	Surface Water Discoloration, Sheen or Free Product	No
	Strong, Pungent or Noxious Odors	No
	Storm water retention or detention ponds	No
	Pits, Ponds, Lagoons	No
Oil and Gas Wells	No	

Drums, Barrels, and/or Containers > 5-gallons: PM observed one 55-gallon drums and totes located in the western portion of the property that were not in secondary containment. Although some of the containers appeared to be empty, others appeared to contain unknown materials. The drums were stored on pavement or soil and appeared to be in good condition. An area of discoloration was observed on a portion of the pavement; however, the discoloration appeared to be due to organic materials and not petroleum based. Based on these observations, PM has not identified the containers as a REC. However, PM recommends the containers be properly disposed of in accordance with State and Federal regulations.

Monitoring Wells: PM observed monitoring wells located in the central portion of the property. Some of the wells were damaged and unusable. The monitoring wells were installed to monitor groundwater contamination on the property, as discussed in Section 3.0.

6.2: Current Operations

The subject property is currently unoccupied and therefore there are no current business operations.

6.2.1: Underground Storage Tank(s)

The subject property contained at least 77 former USTs. The following table indicates the size of the UST, contents, location (if known), the dates of installation and removal, and the source of the information.

Historical UST Information

Number of USTs	Size	Contents	Location	Date Installed	Date Removed	Source
7	10,000-gallon	Unknown	West of former Building R	1956	1985	Fire Dept., Building Dept., & PSI*

**Phase I ESA Update of the Vacant Industrial Property
Located at 1600 West 8 Mile Road, Ferndale, Michigan
PM Project No. 01-6124-1-0002; June 16, 2016**

Number of USTs	Size	Contents	Location	Date Installed	Date Removed	Source
1	1,000-gallon	Unknown	South of former Building R	1956	1985	Fire Dept., Building Dept., & PSI*
8	2,000-gallon	Gasoline and/or Diesel	West of former Building B	Unknown	1985	Fire Dept., Building Dept., & PSI*
15	500-gallon	Unknown	North of former Building H	1942	1985	Fire Dept., Building Dept., & PSI*
11	1,000-gallon	Unknown	North of former Building H	1942	1985	Fire Dept., Building Dept., & PSI*
4	5,000-gallon	Unknown	North of former Building H	1942	1985	Fire Dept., Building Dept., & PSI*
4	10,000-gallon	Unknown	North of former Building H	1942	1985	Fire Dept., Building Dept., & PSI*
14	1,000-gallon	Unknown	North of former Building H	1948	1985	Fire Dept., Building Dept., & PSI*
4	10,000-gallon	Unknown	North of former Building H	1948	1985	Fire Dept., Building Dept., & PSI*
3	1,000-gallon	Unknown	Likely in the vicinity of Buildings O, M, J, E, and/or L	Unknown	1985	Fire Dept., Building Dept., & PSI*
1	500-gallon	Unknown	Unknown	Unknown	1985	Fire Dept., Building Dept., & PSI*
2	10,000-gallon	Fuel oil	North of the boiler room of former Building D	Unknown	1992	Fire Dept., Building Dept., & PSI*
1	1,000-gallon	Fuel oil	South of former Building AE	Unknown	Unknown	Fire Dept., Building Dept., & PSI*
2	15,000-gallon	Diesel and/or gasoline	West of former Building C	1988	2008	Fire Dept., MDEQ, & PSI
1	1,000-gallon	Fuel oil additive	North of the boiler room of former Building D	Unknown	1995	PSI

*PSI-previous site investigations

Fire Department records were inconsistent regarding whether 72 or 73 USTs that were to be removed in 1985; however, a total of 72 USTs appear to have been removed at that time. Refer to Section 3.0 for information pertaining to the previous site investigations.

6.3: Adjoining Property Observations

PM also completed a visual inspection of the adjoining properties from the subject property and public thoroughfares during the June 7, 2016 site reconnaissance. The following paragraphs provide information about the adjoining properties obtained during the site reconnaissance and through review of reasonably ascertainable information.

North Adjoining Property

The north adjoining property, identified as 881 Pinecrest Drive, is occupied by Ferndale High School. Review of historical records documents that the property was formerly vacant land from the 1930s until the current high school was built during the late 1950s. Ground disturbance was observed on the property during the 1940s and 1950s, which may have been part of the subject property disposal practices. Contamination has been identified with the disposal operations that occurred on the subject property during this time period. **Therefore, the potential exists for contamination to be present and to be migrating onto the subject property, which represents a REC.**

East Adjoining Properties, across Pinecrest Drive

The east adjoining property, identified as 140 Pinecrest Drive, is occupied by a gasoline dispensing station. Review of historical records documents that the property was vacant land until a gasoline service station was constructed during the 1940s. That gasoline service station was demolished and the current building was constructed during the 1970s. This site is identified in the regulatory database. Refer to Section 7.5.2 for additional information.

The remainder of the east adjoining properties are currently and have historically been residential.

South Adjoining Property

The south adjoining property is currently Eight Mile Road (an eight lane road) and associated medians, followed by various commercial properties. Review of historical information documents that Eight Mile Road was constructed prior to 1937. The properties south of Eight Mile Road were generally residential until the 1950s. Commercial operations have consisted of gasoline dispensing stations, dry cleaners, and automotive repair; however, based on the distance from the subject property (at least 200 feet) and the regional groundwater flow direction towards the east to southeast, PM has not identified the historical operations across Eight Mile Road a REC.

West Adjoining Properties

The west adjoining property, identified as 2000 West Eight Mile Road, is occupied by Axle of Dearborn. Review of historical records documents that the property was vacant land until the original portion of the subject building was constructed during the late 1940s with additions constructed between the 1950s and 1980s. Historical operations have consisted of printing operations from at least 1950 until at least 2012 and Axle of Dearborn since at least 2013. This tenant space is identified in the regulatory database. Refer to Section 7.5.2 for additional information.

The remainder of the west adjoining properties are currently and have historically been residential.

7.0 UPDATE OF RECORDS REVIEW

PM reviewed the following records to fill in data gaps and confirm no significant changes have been made on the subject property since the previous Phase I ESA was completed.

7.1: Local Assessing Department

Reasonably ascertainable assessment information provided by the Oakland County Assessing Department was obtained and reviewed. Assessing records document that the subject property consists of two parcels containing 33.93 acres. Assessing records document the former buildings present on the property were demolished between 2012 and 2013. Copies of available assessment records for the subject property and the current legal description are included in Appendix C.

7.2: Local Building Department

Reasonably ascertainable assessment information provided by the City of Ferndale Building Department was previously obtained and reviewed. Building Department records document that the property formerly contained over 40 former buildings which were demolished between 2012 and 2014. Building Department records documented several basement walls remained in place as of 2014 to contain contaminated soil which would be excavated in 2015. Records also indicated a fueling station was previously located on the subject property in the loading dock area of Building B. Building Department records provided by CMI-Tech Center Inc., who occupied the building following Ethyl Corporation, provided information about the historical operations in some of the former buildings, which is summarized in the table below. PM attempted to obtain additional records available since the completion of the previous Phase I ESA in November 2015 but was informed that no additional records are available.

Building	Historical Usage	Heat
A	Offices, cafeteria, library, and machine shop operations	Unspecified
B	Office, machine shop, and maintenance of company vehicles	Steam heat with fans
BA	Machine shop	Unspecified
C	Offices, dynamometer testing, fuel testing, and other control testing	Central steam system
D	Office and chemical laboratories	Central steam system
DAN	Chemical laboratory and offices	Boiler system (also services DA)
DA	Offices	Boiler system (also services DAN)
DAS	Auditorium and offices	Unspecified
H	Fuel storage and blending and general storage	Central steam system
E	Offices and large engine dynamometer testing	Unspecified
F	Maintenance, pipe shop, carpenter shop, glass blower shop, and manufacturing	Unspecified
G	Analytical chemistry, testing engine lab, and offices	Unspecified
M	Chemical laboratory with heavy equipment and manufacturing	Steam heat
AN	Dynamometer testing area, dipping operations, and manufacturing	Steam heat
O	Storage	Unheated

U	Chemical experiment operations, pilot programs, and offices	Central steam system
UA	Chemical experiment operations, pilot programs, and offices	Central steam system
R	Fuel blending (indicates former USTs were located in this area but have been removed)	Unspecified
AE	High pressure lab and storage	Unspecified

7.3: Local Fire Department

No recent inspections or violations were available from the City of Ferndale Fire Department.

7.4: Environmental Liens, Activity and Use Limitations, and Government Institutional and Engineering Controls

PM has not identified any record of environmental liens, activity and use limitations, or institutional controls or engineering controls associated with the subject property through review of reasonable ascertainable records.

7.5: Regulatory File Review

PM retained EDR to provide current regulatory database information compiled by a variety of federal and state regulatory agencies. A copy of the complete database is included in Appendix D. The following information was obtained.

Type	Regulatory Agency Database	Approximate Minimum Search Distance (AMSD)	Number of Sites within AMSD
Federal	National Priority List (NPL) Sites	1 mile	0
Federal	Delisted National Priority List (DNPL) Sites	½ mile	0
Federal	Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Sites	½ mile	1
Federal	CERCLIS No Further Remediation Action Planned (NFRAP) Sites	subject property and adjoining properties	1
Federal	Resource Conservation and Recovery Act (RCRA) Corrective Action Report (CORRACTS) Sites	1 mile	1
Federal	RCRA non-CORRACTS Treatment, Storage or Disposal (TSD) Sites	½ mile	0
Federal	RCRA Large Quantity Generators (LQG) Sites	subject property and adjoining properties	0
Federal	RCRA Small Quantity Generators (SQG) Sites	subject property and adjoining properties	0
Federal	RCRA Conditionally Exempt Small Quantity Generators (CESQG) Sites	subject property and adjoining properties	2
Federal	RCRA Non-Generators (NON-GEN) Sites	subject property and adjoining properties	1
Federal	US Brownfield Sites	½ mile	0
Federal	Institutional Control / Engineering Control Registries	subject property	0
Federal	Environmental Response and Notification System (ERNS)	subject property	0

Type	Regulatory Agency Database	Approximate Minimum Search Distance (AMSD)	Number of Sites within AMSD
State & Tribal	Hazardous Waste Sites (HWS) (equivalents to NPL and CERCLIS)	1 mile	0
State & Tribal	Delisted Hazardous Waste Sites (HWS)	1 mile	0
State & Tribal	Solid Waste Facilities/Landfill Sites (SWLF)	½ mile	0
State & Tribal	Historical Landfill Sites (HIST LF)	½ mile	0
State & Tribal	Leaking Underground Storage Tank (LUST) Sites	½ mile	11
State & Tribal	Registered Underground Storage Tank (UST) Sites	subject property and adjoining properties	2
State & Tribal	Institutional Control / Engineering Control Registries	subject property	0
State & Tribal	Brownfield Sites	½ mile	0
State	Baseline Environmental Assessment (BEA) Sites	½ mile	11
Either	Unmappable Database Listings (a.k.a. Orphan Sites)	database-dependent	1

7.5.1: Subject Property and Occupant Listings

The regulatory database report identified the following listings for the subject property or its known occupants on the referenced databases:

CMI-Tech Center Inc., Hayes Lemmerz Tech Svc Inc., Cedan Holdings Property, and Ethyl Corp – The subject property is identified as a closed LUST site with one release reported in 1996 and granted Tier I Unrestricted Residential Closure in 1998, a BEA site, a CERC-NFRAP site (aka SEMS-Archive (Superfund Enterprise Management System Archive), a CORRACTS site, a RCRA-CESQG site with violations reported in 1995 and 2001 with no correction date provided, and a former UST site. Additionally, the subject property is listed in the Facility Index System (FINDS) and the Waste Data System (WDS) databases which is likely associated with the RCRA generator status. Refer to Section 3.0 for a summary of the LUST and BEA site investigation activities and Section 6.2.1 for a summary of the former UST systems. The historical operations were not adequately assessed during the previous site investigations; therefore, have been identified as a REC.

7.5.2: Adjoining and Nearby Sites

PM's review of the referenced databases also considered the potential or likelihood of contamination from adjoining and nearby sites. To evaluate which of the adjoining and nearby sites identified in the regulatory database report present an environmental risk to the subject property, PM considered the following criteria:

- The type of database on which the site is identified.
- The topographic position of the identified site relative to the subject property.
- The direction and distance of the identified site from the subject property.
- Local soil conditions in the subject property area.

- The known or inferred groundwater flow direction in the subject property area.
- The status of the respective regulatory agency-required investigation(s) of the identified site, if any.
- Surface and subsurface obstructions and diversions (e.g., buildings, roads, sewer systems, utility service lines, rivers, lakes, and ditches) located between the identified site and the subject property.

Only those sites that are judged to present a potential environmental risk to the subject property and/or warrant additional clarification are further evaluated. Using the referenced criteria, and based upon a review of readily available information contained within the regulatory database report, PM did not identify adjoining (i.e., bordering) or nearby sites (e.g., properties within a ¼-mile radius) listed in the regulatory database report that were judged to present a potential environmental risk to the subject property, with the exception of the following:

Albadyah Inc and Knight Enterprises Inc. – This site is identified as 140 Pinecrest Drive and is the east adjoining property. Review of the regulatory database indicates this site is identified as an active UST site and a RCRA-NonGen with no violations reported. The property currently contains seven USTs ranging from 4,000 gallons to 8,000 gallons that contain gasoline, diesel, or kerosene and were installed in 1976. Additionally, one 550-gallon used oil UST and one 1,000-gallon fuel oil UST were removed from the property in 1993. No releases were reported during the removal of the USTs. Based on the distance from the subject property (across Pinecrest; over 100 feet), and the groundwater flow direction towards the east to southeast (away from the subject property), PM has not identified this site as a REC.

Axle of Dearborn and AT&T Wireless – This site is identified as 2000 West Eight Mile Road is the west adjoining property. Review of the regulatory database indicates that the site is a RCRA-CESQG with no violations reported and a BEA site. Review of available MDEQ records documents that the property was historically occupied by printing operations from the 1950s until the 2000s, and one soil boring was advanced on the property in the northeastern parking area to evaluate a small portion of the property which was going to be leased by AT&T. Low levels of PNAs were detected in the soil. Printing operations generally consist of the use of hazardous substances and/or petroleum based products. **Based on the relative close proximity (within 50 feet) and the groundwater flow direction towards the property, the potential exists for a release to have occurred on this property and to have migrated onto the subject property, which represents a REC.**

Additional LUST sites and BEA sites were identified within one-eighth of a mile; however, based on several factors including the distance of the sites from the property, the low mobility of the contaminants present at the sites, the removal of the sources(s) of the contamination, the groundwater flow direction in relation to the subject property, and/or the delineation of the contamination towards of the subject property, PM has not identified these sites as RECs.

8.0 FINDINGS, OPINIONS AND CONCLUSIONS

8.1: De Minimis Condition

A de minimis condition, as defined in the ASTM Standard, is a condition that generally does not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions

determined to be de minimis are not RECs or CRECs. No de minimis conditions were identified during this assessment.

8.2: Significant Data Gaps

A data gap, as defined in the ASTM Standard, is a lack of or inability to obtain information required by the ASTM Standard despite good faith efforts by the environmental professional to gather such information. The environmental professional must then determine whether these gaps are significant. PM did not identify or encounter any instances of significant data gaps during the course of this ESA.

8.3: Historical Recognized Environmental Conditions (HRECs)

An HREC, as defined in the ASTM Standard, is a past release of hazardous substances or petroleum products that has occurred in connection with the subject property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted residential use criteria established by a regulatory authority, without subjecting the subject property to any required controls. PM has not identified any HRECs in association with the subject property.

8.4: Controlled Recognized Environmental Conditions (CRECs)

A CREC, as defined in the ASTM Standard, is a recognized environmental condition (REC) resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. The following CREC was identified:

- The subject property is a closed Leaking Underground Storage Tank (LUST) site with one release reported in 1995 and granted a Tier 1 Unrestricted Residential LUST Closure in 1998. Review of previous site assessment activities documents that the release was associated with the former 15,000-gallon gasoline and/or diesel USTs installed in 1988. Soil contamination remains on-site above the current Part 213 Tier 1 Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSIP) Risk Based Screening Levels (RBSLs). Based on the required due care obligations and documented site assessment activities which were adequate to assess the former release from these USTs, PM has identified the closed LUST status as a CREC.

As per the ASTM Standard, CRECs are also identified as RECs. Refer to the REC bullet below for additional information.

8.5: Recognized Environmental Conditions (RECs)

We have performed a Phase I Environmental Site Assessment Update in conformance with the scope and limitations of ASTM Practice E 1527-13 of the Vacant Industrial Property located at 1600 West 8 Mile Road, Ferndale, Oakland County, Michigan, the property. Any exceptions to, or deletions from, this practice are described in Section 1.1 of this report. This assessment has revealed no evidence of recognized environmental conditions connected with the property except the following:

- The subject property was occupied by a research and development facility for chemical additives for gasoline from the 1930s until the 1980s, followed by manufacturing operations from the 1980s until vacated in 2012. Based upon review of the previous subsurface investigations, soil and groundwater contamination is present which exceeds the current Part 201 Residential and Nonresidential Generic Cleanup Criteria. Based on these analytical results, the subject property would be classified as a "facility," as defined by Part 201 of P.A. 451 of the Michigan NREPA, as amended.
- Review of available information documents that laboratory wastes, residues, glassware, foundry sands, and containers were buried in the northern, central, and eastern portions of the subject property. The previous site investigations were not adequate to assess these former disposal areas. Review of Health Department records documents that 11 disposal pits were located in the vicinity of former Building AE, the majority of which were located east of the building; unmapped disposal areas were also reported to be present north of former Building AI and in the vicinity of the eastern parking lot from the 1930s through the 1980s. Additionally, review of aerial photographs document ground disturbance throughout the northern and/or central portion of the subject property during the 1930s through the 1970s. The previous site investigations were limited to two small areas north and northeast of former Building AE and in the vicinity of the eastern parking area. Contamination has been identified above MDEQ Part 201 Generic Cleanup Criteria (GCC) in the assessed portions of the disposal areas. Additionally, based on the operations of the site and the information provided, the potential exists for drums or potential explosive or reactive materials to have been buried. Based on this information, the potential exists for additional contamination and/or potentially hazardous materials may be present below the subsurface.
- The subject property formerly contained at least 78 USTs. The majority of the USTs were located within three UST farms, located west of former Building R, west of former Building B, and north of former Building H (in between former Buildings B and C). Additional USTs were located north of former Building D, south of former Building AE, and in the vicinity of former Buildings O, M, E, and F. The previous site investigations were not adequate to assess the USTs, with the exception of the two former 15,000-gallon gasoline/diesel USTs which were located west of former Building C and the 1,000-gallon fuel oil UST located south of former Building AE. Free product was found in a monitoring well located in the vicinity of the former 10,000-gallon heating oil USTs located in the vicinity of former Building D. One soil sample was collected west of former Building B to assess eight former USTs and gasoline dispensing operations; no soil and/or groundwater samples were collected to assess the USTs which were located in the central portion of the property including the UST farm formerly located west of former Building R; 54 USTs were located north of former Building H; however, only a few soil and groundwater samples were collected in this area. Based on the long time period of operations and the number of USTs identified, the potential exists for additional USTs to be present. Records reviewed document that heating oil USTs were not registered and/or thoroughly documented. Additionally, USTs outside of the three main UST farms were not well documented as to the location. The previous site investigations did not include GPR survey. Based on this information, the potential exists for additional contamination and/or for orphan USTs to be present.

- Historical operations included blending of fuels, foundry operations, service operations, maintenance operations, chemical storage, incinerator, and laboratory testing from the 1930s until the 1980s followed by manufacturing operations. The previous site investigations were not adequate to assess the historical operations. No soil and/or groundwater sampling was conducted within the building footprints, former chemical storage areas, oil sumps, foundry operations, machine shop operations, fuel blending operations, service garage, and maintenance operations were also not adequately assessed. Therefore, the potential exists for additional contamination to be present.

The following adjoining and/or nearby RECs have been identified:

- Ground disturbance was observed on the north adjoining property, identified as 881 Pinecrest Drive, during the 1940s and 1950s, which may have been part of the subject property disposal practices. Contamination has been identified with the disposal operations that occurred on the subject property during this time period. Therefore, the potential exists for contamination to be present and to be migrating onto the subject property.
- The west adjoining property, identified as 2000 West Eight Mile Road, is a BEA site. Review of available MDEQ records documents that one soil boring was advanced on the property in the northeastern parking area. Low levels of PNAs were detected in the soil. The property was historically occupied by printing operations from the 1950s until the 2000s. Printing operations generally consist of the use of hazardous substances and/or petroleum based products. Based on the relative close proximity (within 50 feet) and the groundwater flow direction towards the property, the potential exists for a release to have occurred on this property and to have migrated onto the subject property.

8.6: Recommendations

We have performed a Phase I Environmental Site Assessment Update in conformance with the scope and limitations of ASTM Practice E 1527-13 of the Vacant Industrial Property located at 1600 West 8 Mile Road, Ferndale, Oakland County, Michigan, the property. Any exceptions to, or deletions from, this practice are described in Section 1.1 of this report. This assessment has revealed no evidence of recognized environmental conditions connected with the property except as listed in Section 8.5 of this report.

Parts 201 and 213 of the 1994 Michigan Natural Resources Environmental Protection Act (NREPA) provide liability protection for off-site migration of contamination to the subject property. Legal counsel should be consulted regarding issues related to potential off-site migration of contaminants.

Verification of the presence or absence of contaminants potentially associated with these RECs may be determined through a Phase II investigation at the request of the client. Cost/risk analysis decisions associated with further investigation of these conditions are the decision of the client.

9.0 NON-ASTM SCOPE CONSIDERATIONS/BUSINESS ENVIRONMENTAL RISKS

PM has included a discussion of Non-ASTM Scope Considerations based upon industry standards and lender requirements. A Business Environmental Risk is defined as a risk which can have a material environmental or environmentally-driven impact on the business associated

with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice.

Non-ASTM Item	Observations or Information
Potential Asbestos Containing Building Materials (ACBM)	Based upon PM's limited visual observations during the site reconnaissance, suspect ACBMs identified included 12 inch by 12 inch vinyl floor tiles, wood panel walls, and drywall walls and ceilings. The materials appeared to be in good condition. The materials in the guard house should be sampled if renovation or demolition activities are planned, and if found to be asbestos containing, should be repaired or removed by a licensed asbestos contractor in accordance with all applicable federal, state, and local regulations. Repair or removal operations should be supervised by an independent, third party industrial hygiene firm. Any remaining asbestos-containing materials can be maintained with a properly developed Asbestos Operations and Maintenance (O&M) Program. PM can provide a proposal to perform this work at the request of the client.
Lead Based Paint	Because the guard house was constructed by 1937, there is a potential that the paint in the guard house is lead-based. However, the painted surfaces were observed to be in generally good condition, the subject property is not a residential use, and there is no regulatory requirement to sample suspected lead-based painted surfaces at this time. Therefore, no samples were collected and no further action or investigation is recommended regarding suspected LBP at the subject property. The potential for lead based paint to be present in the mobile trailer is unlikely.
Visual Mold or Significant Moisture Damage	PM performed a limited visual assessment for the presence of mold, conditions conducive to mold, and evidence of moisture in readily accessible interior areas of the subject property. PM did not note obvious visual indications of the presence of mold, conditions conducive to mold, or evidence of moisture in readily accessible interior areas of the subject property.

10.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental professional* as defined in §312.10 of 40 CFR 312 and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Beth Sexton
 National Due Diligence Manager

11.0 REFERENCES

The following published sources were utilized during completion of this Phase I ESA:

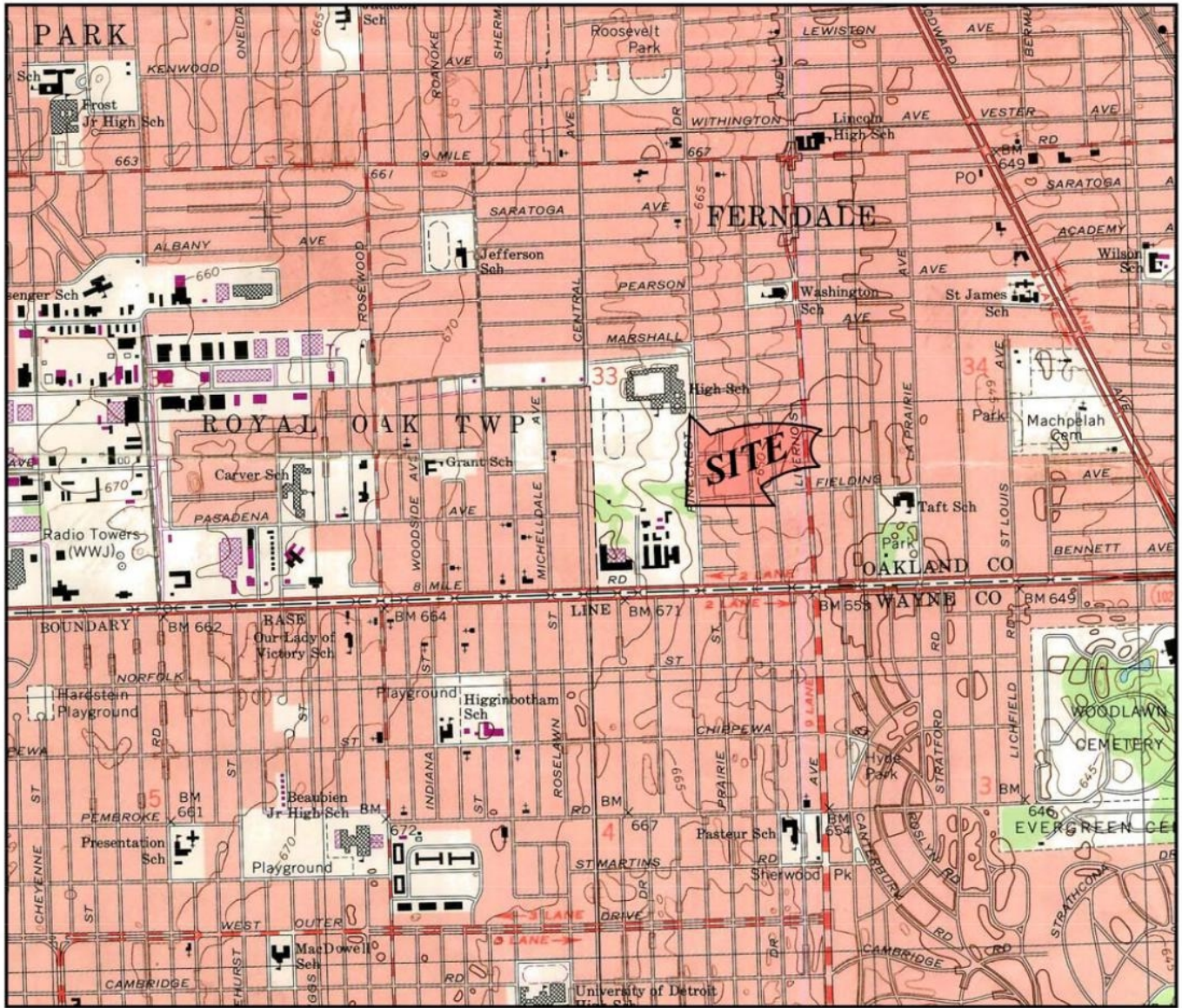
- *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, ASTM, ASTM Designation E 1527-13, Published November 2013.
- United States Geological Survey Division (U.S.G.S.) 7.5 Minute Topographic Map Royal Oak, Michigan Quadrangle, 1996.

In addition, PM reviewed the following previous site investigations, some of which are available from public sources.

Name of Report	Date of Report	Company that Prepared Report
Health Department Correspondence (Magnetometer Survey)	1985-1986	Between Ethyl Corporation and Oakland County Health Division
Leaking Underground Storage Tank (LUST) Closure Report	4-3-1997	Swanson Environmental
Phase I ESA	11-27-2012	RJN Environmental
Baseline Environmental Assessment (BEA)	12-2-2012	RJN Environmental
Phase II ESA	12-18-2012	RJN Environmental
Phase II ESA	11-1-2013	RJN Environmental
Phase I ESA	11-3-2015	PM

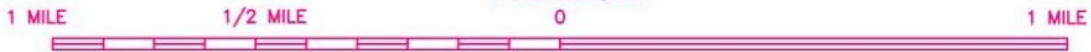
Figures





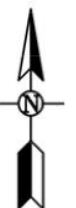
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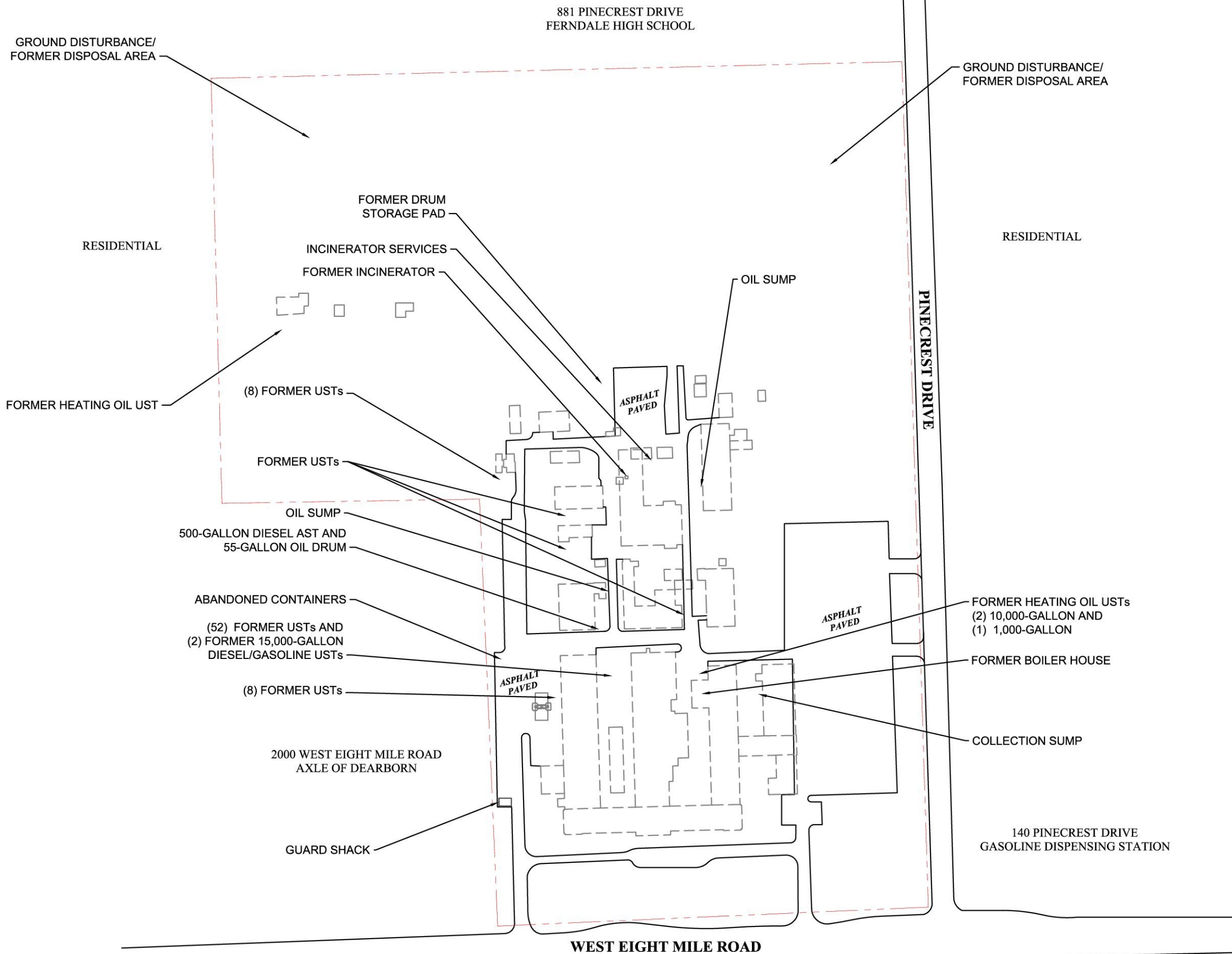
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MICHIGAN QUADRANGLE LOCATION

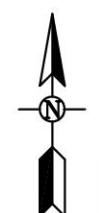
FIGURE 1
PROPERTY VICINITY MAP
USGS, 7.5 MINUTE SERIES
ROYAL OAK, MI QUADRANGLE, 1996.





LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FORMER FUEL DISPENSER
- UST UNDERGROUND STORAGE TANK



Environmental & Engineering Services

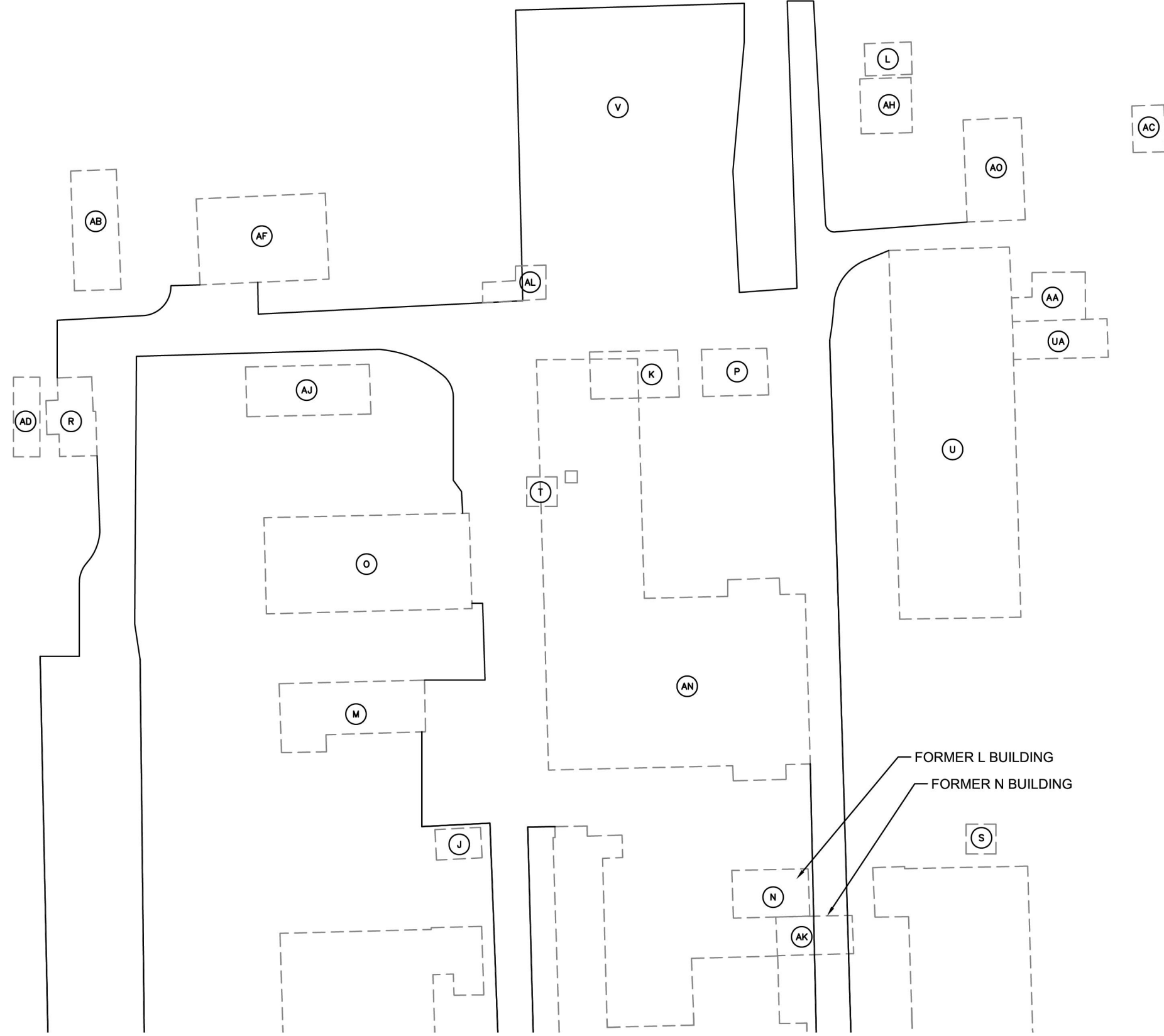
FIGURE 2
GENERALIZED DIAGRAM OF THE SUBJECT PROPERTY AND ADJOINING PROPERTIES

PROJ: VACANT INDUSTRIAL PROPERTY
1600 WEST 8 MILE ROAD
FERNDAL, MI

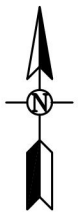
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VERIFY SCALE 180'	CHKD BY: LS/AM	SCALE: 1" = 180'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	FILE NAME: 01-6124-1-002F00R00	

0

7429-7745 WEST EIGHT MILE ROAD COMMERCIAL PROPERTIES 7461 WEST EIGHT MILE ROAD 7429 WEST EIGHT MILE ROAD



AL	VEHICLE FUELING
AC	ACTIVE METAL STORAGE
AD	CONCRETE SLAB
AH	CHEMICAL ENGINEERING PROJECTS
L	BULK CHEMICALS
UA	CHEMICAL RES.
U	CHEMICAL RES. AND PILOT PLANT
V	DRUM STORAGE
AF	DRUM STORAGE
AJ	CAN STORAGE
O	MAINTENANCE STORAGE
M	CHEMICAL DEVELOPMENT LAB
AN	EMISSIONS LAB
N	CHEMICAL STORAGE
AK	LIQUID NITROGEN
J	FUEL STORAGE
AB	CAN STORAGE
R	FLEET BUILDING
K	CHEMICAL SUPPLIES STORAGE
P	CHEMICAL STORAGE



LEGEND:

--- APPROXIMATE FORMER/HISTORICAL SITE FEATURES



FIGURE 3
ZOOMED IN SECTION OF FORMER
NORTHERN BUILDINGS

PROJ: VACANT INDUSTRIAL PROPERTY
1600 WEST 8 MILE ROAD
FERNDAL, MI

THIS IS NOT A LEGAL SURVEY VERIFY SCALE 0 50'	DRN BY: CS	DATE: 6/10/2016
	CHKD BY: LS/AM	SCALE: 1" = 50'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	FILE NAME: 01-6124-1-002F00R00	



E	OFFICES, AUTO APP. DEPARTMENT
F	MAINTENANCE AND SERVICES
G	ANALYTICAL LAB
AL	VEHICLE FUELING
A	EXECUTIVE OFFICES
B	EXPERIMENT, MACHINE SHOP, GARAGE AND REF. TECHNICIAN
C	ENGINE RES. AND DYNAMOMETER
D	CHEMICAL LAB, LIBRARY, PHOTO AND FILES
DA	CHEMICAL RES., EXECUTIVE OFFICES AND PLANT
DAN	CHEMICAL RES. LAB
DAS	AUDITORIUM
BA	SHIPPING AND RECEIVING, AND COMPUTERS
H	FUEL BLENDING
Q	GUARD SHACK

LEGEND:

- - - - - SUBJECT PROPERTY
- - - - - APPROXIMATE FORMER/HISTORICAL SITE FEATURES

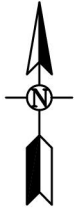


FIGURE 4
ZOOMED IN SECTION OF FORMER
SOUTHERN BUILDINGS

PROJ: VACANT INDUSTRIAL PROPERTY
1600 WEST 8 MILE ROAD
FERNDALE, MI

THIS IS NOT A LEGAL SURVEY VERIFY SCALE 0 50' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	DRN BY: CS	DATE: 6/10/2016
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FILE NAME: 01-6124-1-002F00R00		

Appendix A



SITE PHOTOS



Photographs From Site Reconnaissance
PM Project No. 01-6124-1-0002
Location: 1600 West 8 Mile Road, Ferndale, Michigan

Photograph 1



Subject property

Photograph 2



Subject property



Photographs From Site Reconnaissance
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Photograph 3



Subject property

Photograph 4



Subject property



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Photograph 5



Subject property

Photograph 6



Subject property



Photographs From Site Reconnaissance
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Photograph 7



Guard house

Photograph 8



Guard house



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Photograph 9



Mobile trailer

Photograph 10



Abandoned containers and drums in the southwestern portion of the property



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Photograph 11



The north adjoining high school

Photograph 12



The east adjoining gasoline dispensing station



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Photograph 13



The south adjoining properties

Photograph 14



The west adjoining light industrial property