

**BASELINE ENVIRONMENTAL  
ASSESSMENT**

**Conducted Pursuant to Section 20126(1)(c) of  
1994 PA 451, Part 201, as amended, and the  
Rules promulgated thereunder**

**FORMER KLEIN TOOLS PROPERTY  
121 WATER STREET  
JONESVILLE, MICHIGAN**

**SME Project Number: LE61837A  
January 27, 2011**



### Baseline Environmental Assessment Submittal Form

*This form is for submittal of a Baseline Environmental Assessment (BEA), as defined by the Environmental Remediation, Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and the Part 201 Rules promulgated thereunder, for the purpose of establishing an exemption to liability pursuant to Section 20126(1)(c) for a new owner or operator of property that is a facility as defined by Section 20101(1)(r). 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 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 Rule 919. An owner or operator of a facility also has due care obligations under Section 20107a 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 response activities need to be available, but not submitted, to the DNRE within 8 months of becoming the owner or operator of a facility.*

#### **Submitter Information**

Name of legal entity that will own or operate the property: Village of Jonesville Address: 265 East Chicago Street City: Jonesville State: Michigan Zip: 49250 Contact person (Name & Title): Adam Smith; Village Manager Telephone: (517) 849-2104 E-Mail: manager@jonesville.org	Contact for BEA questions if different from submitter Name & Title: Brian S. Trent, P.E.; Project Engineer Company: Soil and Materials Engineers, Inc. Address: 4705 Clyde Park Ave. SW City: Grand Rapids State: Michigan Zip: 49509 Telephone: (616) 406-1756 E-Mail: trent@sme-usa.com
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#### **Property Information**

Street Address of Property: 121 Water Street City: Jonesville State: Michigan Zip: 49250 Property Tax ID (include all applicable IDs): 06-060-001-004, 06-060-001-034, 06-060-001-036, and 06-060-001-038 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): <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Former</td> <td style="text-align: center;">Current</td> <td style="text-align: center;">Prospective</td> </tr> <tr> <td style="text-align: center;">Owner <input type="checkbox"/></td> <td style="text-align: center;">Operator <input checked="" type="checkbox"/></td> <td style="text-align: center;">Operator <input type="checkbox"/></td> </tr> </table>	Former	Current	Prospective	Owner <input type="checkbox"/>	Operator <input checked="" type="checkbox"/>	Operator <input type="checkbox"/>	County: Hillsdale City/Village/Township: Jonesville Town: 6S Range: 3W Section: 4 Quarter: NW Quarter-Quarter: NE Decimal Degrees Latitude: 41.9836 Decimal Degrees Longitude: 84.6643 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"/>
Former	Current	Prospective					
Owner <input type="checkbox"/>	Operator <input checked="" type="checkbox"/>	Operator <input type="checkbox"/>					

#### **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:	12/28/2010
Date Baseline Environmental Assessment Report conducted:	01/27/2011
Date submitter first became the owner:	12/28/2010
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:	

#### **Source of contamination at the property (check all that are known to apply):**

Facility regulated under Part 201, other source, or source unknown Part 201 Site ID, if known:	<input checked="" type="checkbox"/>
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"/>

**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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Is the All Appropriate Inquiry (AAI) compliant with 40 CFR 312, or is the Phase I Environmental Assessment compliant with ASTM E1527-05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Was the BEA, including the AAI and sampling, conducted either prior to or within 45 days of the date of becoming the owner, operator, or of foreclosure, whichever is earliest, or within the alternate time-frames provided in Part 201 Rule 905(3) for submitters involved in oil and gas development under Part 615 or 625 property, or Rule 905(9) for property acquired through condemnation procedures?	<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. If the BEA relies on studies or data prepared by others or conducted for other purposes, does the BEA provide sufficient rationale to demonstrate that the data are reliable and relevant to define conditions at the property at the time of purchase, occupancy, or foreclosure?	<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)(f)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Environmental Professional Signature:**

*I certify that to the best of my knowledge and belief, this BEA and all related materials are true, accurate, and complete and that I performed, or was responsible for the performance of, an All Appropriate Inquiry in conformance with the scope and limitations of the All Appropriate Inquiry Rule, 40 CFR 312 or a Phase I Environmental Site Assessment in conformance with the scope and limitations of the ASTM E1527-05 and have provided the sampling and analysis that confirm the property is a facility as defined by Section 20101(1)(r). Any exceptions to, or deletions from, the All Appropriate Inquiry Rule or ASTM E1527-05 are described in Section 1 of the BEA report. I understand that intentionally submitting false information in a BEA is a felony and may result in fines of up to \$25,000 for each violation.*

Signature:



Date:

2/2/11

Printed Name: Brian S. Trent, P.E.

Company: Soil and Materials Engineers, Inc.

Mailing Address: 4705 Clyde Park Ave. SW

City: Grand Rapids

State: Michigan

Zip: 49509

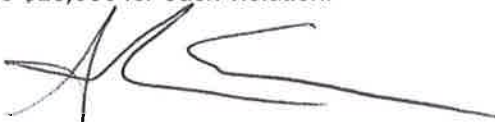
Telephone: (616) 406-1756

E-Mail: trent@sme-usa.com

**Submitter 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. I understand that intentionally submitting false information in a BEA is a felony and may result in fines of up to \$25,000 for each violation.*

Signature:



Date:

2/1/11

Printed Name: Adam Smith

Title and Relationship of signatory to submitter: Village Manager

Address: 265 East Chicago Street

City: Jonesville

State: Michigan

Zip: 49250

Telephone: (517) 849-2104

E-Mail: manager@jonesville.org

**Contents of BEA Report - Former Klein Tools Property, Jonesville, Michigan**

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b. Survey map(s) (not aerial) showing property boundary, property tax ID, and, if applicable, parcel boundaries.	App. G	--
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d. Scaled area map showing property in relation to surrounding area (such as topographic or aerial maps).	Fig. 1	--
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<b>4. Identification of the author of the BEA</b>		
a. Name, qualifications as an environmental professional, company, contact information, etc.	1.0 and App. H	1
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## 1. INTRODUCTION

This report presents the results of a BEA of the former Klein Tools property, located at 121 Water Street in the Village of Jonesville, Hillsdale County, Michigan, 49250, hereinafter referred to as the “Property”. The approximate Property location is shown on Figure 1 “Property Location Map”. Soil and Materials Engineers, Inc. (SME) prepared this BEA report for disclosure to the Michigan Department of Natural Resources and Environment (MDNRE) on behalf of the Village of Jonesville, the Property owner. The Village of Jonesville can be contacted at:

265 East Chicago Street  
Jonesville, Michigan 49250  
Phone: (517) 849 – 2104  
Email: [manager@jonesville.org](mailto:manager@jonesville.org)

The Village of Jonesville acquired the Property on December 28, 2010. The Village of Jonesville plans to redevelop the Property in the future; however, currently the building on the Property is being leased to a local manufacturer for storage of idle manufacturing machinery and supplies. The anticipated future use is for mixed recreational, commercial and/or industrial use.

SME prepared this BEA report pursuant to Section 20126 of Part 201 of the Natural Resources and Environmental Protection Act (NREPA), Public Act 451 of 1994, as amended (Part 201). This report is intended to meet the requirements of a BEA and was prepared in general accordance with the Administrative Rules for Part 201, effective December 21, 2002, as amended, and the MDNRE “Baseline Environmental Assessment Submittal Form”, form EQP 4025 (12/10), including the attached guidance document “Contents of a BEA Report”. SME is submitting this BEA to the MDNRE for disclosure in accordance with Section 20126(1)(c)(ii) of Part 201. This BEA was conducted and completed on January 27, 2011.

### **1.1 Historical Uses and All Appropriate Inquiry Findings**

Historical uses of the Property were evaluated through a Phase I Environmental Site Assessment (ESA) completed by SME. SME completed the Phase I ESA report for the Property on December 28, 2010 on behalf of the Village of Jonesville. The SME Phase I ESA is included as Appendix A.

The Property is comprised of four parcels, the main parcel along the St. Joseph River, a small parcel to the north of the main parcel, and two parcels east of Water Street.

As of 1884, the earliest date of readily ascertainable historical records for the main parcel along the St. Joseph River, this parcel was occupied by the Jonesville Woolen Mill building

located on the central portion of the parcel, as well as a restaurant, an engineering business, a steam printing business, and a meat market along Chicago Street. During the commercial/industrial history of this parcel, the following occupied the parcel after 1884: a fire house, hardware store, tin shop, photo shop, shed, ice house, agricultural implements store, wagon shop, bowling alley, paint shop, dwelling, machine shop, laundry cleaning and pressing business, printing business, carpenter shop, auto garage, hardware store, auto repair facility, hay rack factory, auto sales business, and lodge/hall. Vaco Products, a manufacturer of metal hand tools, operated on the Property from 1945 until 1986, when Klein purchased the Property and continued the manufacturing of hand tools until approximately 2008. Since 2008, a local manufacturer has leased the building for storage of idle manufacturing machinery.

As of 1892, the earliest date of readily ascertainable historical records for the northern parcel, this parcel on the west side of Water Street was a creamery. By 1907, the creamery was vacant and was demolished prior to 1913. After 1913, the parcel was occupied by a residence and a Baptist church. In 1972, this parcel is listed in a city directory as storage for Vaco Products and remained as such until sometime between 1984 and 1990.

The earliest date of readily ascertainable historical records for the eastern parcels, the portion of the Property on the east side of Water Street, was 1884. Since 1884, the parcels have been occupied by residences and a hotel. These buildings were demolished between 1968 and 1972 and the parcels were subsequently used as parking areas for the adjacent Vaco Products manufacturing facility.

The current building is heated with natural gas; however, some historical structures on the Property were documented to have used coal for heating. Additional undocumented heating sources may have been used in other historical structures on the Property.

At the time of SME's reconnaissance, the building on the Property was a vacant manufacturing facility which was being leased and used for machinery storage. A vacant lot and gravel driveway was located north of the manufacturing facility, and an asphalt parking lot was located on the east side of Water Street (eastern parcels). The remainder of the Property was paved with asphalt or concrete.

The Phase I ESA revealed no evidence of recognized environmental conditions in connection with the Property, except for the following:

- Two previous environmental investigations were conducted on the Property. These investigations included soil borings and monitoring wells to evaluate some of the RECs listed below. Investigations by NTH Consultants, Ltd. in 2008 and ERM in 2010 indicated that volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals were detected at concentrations exceeding Michigan's Generic Residential and Commercial I Cleanup Criteria. Soil

concentrations of VOCs, PAHs, and metals exceeded the drinking water protection (DWP) criteria, groundwater surface water interface protection (GSIP) criteria, and/or direct contact criteria (DCC). Groundwater concentrations exceeded the drinking water criteria (DWC).

- The property was historically used for numerous commercial and industrial operations, many of which would have involved the storage and use of hazardous substances, as well as generation of waste materials. Limited information exists regarding hazardous substance use, handling, and disposal as part of these commercial/industrial applications.
- The current manufacturing building contains several areas in which hazardous substances were known to have been used or stored in significant quantities, including an oil drum overflow pit, two coolant catch pits, a trichloroethylene (TCE) vapor polisher area, a black oxide coating area, and several material storage areas. The unknown material handling procedures, significant hazardous substances used, and varying structural conditions of these areas constitute areas in which hazardous substances may have been released to the subsurface.
- A former employee at the Property filed a complaint reports with local and state agencies in 2006. The complaint reported that a former employee had dumped spent trichloroethene (TCE) out the back loading dock door and that during installation of a sewer in this area, workers noted odorous soils in this area. A subsequent Phase II ESA confirmed the presence of TCE in soil and groundwater in this area. The report also indicated that a hole was drilled through the floor of the black oxide area to drain accumulated liquids through the floor and that oil leaked through the floor in the draw furnace area.
- The owner questionnaire indicated the former presence of an on-site septic field or dry well; monitoring wells; underground sumps, lines, basins, or tanks; above ground and underground storage tank(s); and barrel or drum storage areas throughout the current building. Follow-up interviews of the owner's representative and former site manager indicated the specific locations of some of these structures or areas was not known; therefore, the potential exists for subsurface contamination throughout the manufacturing plant for the above noted items to impact soil and/or groundwater.
- A former gas station was located on the northwest corner of Chicago and Water Streets, which is within the footprint of the existing manufacturing building. Limited information is available regarding the soil and/or groundwater conditions in the area of this former gas station.
- Several pole mounted electrical transformers on the west side of the building were documented as formerly containing polychlorinated biphenyls (PCBs).
- An open LUST site and two former manufacturing facilities are located immediately south of the Property. Limited or no information regarding the conditions at these



sites was available. Furthermore, three underground storage tanks are depicted in the Chicago Street right-of-way in historic Sanborn Fire Insurance Maps. If releases from these sources have occurred, impacted groundwater could migrate to the Property.

- The general soil profile from soil borings performed by others indicated that up to eight feet of fill material containing brick, slag, cinders, coal, and other debris exists across the Property. In addition, numerous structures were demolished at the Property since the late 1800's. The nature and extent of backfill material used is undocumented. Fill material of this nature commonly contains hazardous substances such as PAHs and metals.

There were no exceptions to, or deletions from, the All Appropriate Inquiry Rule 40 CFR 312 or ASTM E1527-05 in the conduct of the Phase I ESA. SME identified three data gaps in connection with the Phase I ESA. A chain-of-title search was not completed prior to the Phase I ESA completion, the first known use of the Property was not identified, and a local unit of government official was not interviewed. Several sources of information were used to compile a detailed history of the site; therefore, these data gaps did not impair SME's ability to identify RECs in connection with the Property.

SME identified one limitation in connection with the Phase I ESA. The building floor was substantially covered with machinery and supplies currently being stored in the building, which prevented observations of much of the building's floor. SME performed the site reconnaissance with a Klein staff member knowledgeable of the processes formerly employed and structures currently and formerly present in the building floor; therefore, this limitation did not significantly impair SME's ability to identify RECs in connection with the Property. Further, due to the historic industrial activities and other RECs identified in connection with the Property, it is unlikely that significant additional RECs would have been identified if the building's floor was not covered.

## **1.2 Basis for BEA**

SME performed a Phase II ESA at the Property on December 1 and 2, 2010. Previous subsurface investigation activities were completed by NTH Consultants, Ltd. (NTH) in November 2008 and by Environmental Resources Management (ERM) in May 2010. Data from the NTH Phase II ESA and the Phase II ESA report prepared by ERM are included in Appendices B and C, respectively. Investigation procedures, soil boring logs, and laboratory analytical results from SME's Phase II ESA are included in Appendices C, D, and E, respectively. The results of the investigations identified soil and groundwater contamination at concentrations greater than applicable Part 201 Residential and Commercial I Generic Cleanup

Criteria (Part 201 criteria). Contaminants detected in the soil and/or groundwater at levels exceeding Part 201 criteria included arsenic, chromium, copper, lead, mercury, selenium, silver, zinc, benzene, cis-1,2-dichloroethylene, naphthalene, trichloroethylene, 1,2,4-trimethylbenzene, vinyl chloride, xylenes, acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, and phenanthrene. Based on these results, the Property is considered a “facility” as defined by Part 201, Section 20101(1)(r), and a BEA was prepared.

## 2. PROPERTY DESCRIPTION

The Property's is collectively known as 121 Water Street in the Village of Jonesville, Hillsdale County, Michigan, 49250; however, the Property is comprised of four legal parcels, as follows:

- 06-060-001-038 - Main plant parcel which contains the factory building (121 Water Street);
- 06-060-001-004 - Vacant parcel to the north of a Consumers Energy electrical substation and main plant parcel (no street address);
- 06-060-001-036 - Northern parking lot parcel at the southeast corner of Water Street and North Street (no street address);
- 06-060-001-034 – Southern parking lot parcel on the east side of Water Street, north of the unnamed alley (no street address).

The legal descriptions and boundary survey drawings for the Property are included in Appendix G of this BEA report.

The Property is located adjacent to the St. Joseph River, north of Chicago Street/US-12, with parcels on both the west and east sides of Water Street. The main parcel is occupied by one industrial building. The building is primarily one story; however a second story office area is located on the northeast portion of the building. The plant building is generally built slab-on-grade with steel and cinder block construction and is serviced by natural gas and electricity and by municipal storm and sanitary sewers and water service. The main floor of the building is approximately 64,100 square feet, with an approximately 4,400 square foot second story office area. The remainder of this parcel is comprised of asphalt or concrete paved driveways. At the time of the conduct of this BEA, the building on the Property was being leased by a local manufacturer for storage of idle machinery and supplies. The Property was most recently known for its use as a manufacturing facility which produced screwdrivers and other hand tools.

The northern parcel of the Property is a vacant lot. The two parcels east of Water Street are asphalt paved parking lots. The surrounding area is comprised of primarily commercial and retail properties to the east, west, and south, and residential properties to the north.

Photographs illustrating observed Property conditions and surrounding areas, taken by SME on November 24, 2010, are included in Appendix B of the SME Phase I ESA report (Appendix A).

### 3. KNOWN CONTAMINATION

Subsurface contamination was identified through SME's Phase II ESA of the Property in December 2010, as well as a Phase II ESA by NTH in November 2008 and a Phase II Investigation by ERM in May 2010. An overview of these investigations is summarized in the following subsections.

#### **3.1 Phase II ESAs**

##### **3.1.1 NTH Phase II ESA – November 2008**

NTH conducted a limited Phase II ESA of the Property on November 12, 2008. NTH advanced 13 direct push soil borings (B-1 through B-13) and installed and sampled two (2) temporary monitoring wells at soil borings B-4 and B-9 to evaluate recognized environmental conditions (RECs) identified in a 2008 NTH Phase I ESA for the Property. The approximate locations of the direct push borings are shown on Figure 2 "Property Features and Soil Boring Location Diagram". Details of sampling rationale were not made available to SME; however, data from the NTH Phase II ESA that was provided to SME are included in Appendix B.

##### **3.1.2 ERM Phase II Investigation – May 2010**

ERM conducted a limited Phase II ESA of the Property on March 23 and 24, 2010. ERM installed six (6) temporary wells, MW-1S (shallow), MW-1D (deep), and MW-2 through MW5 to assess an area where NTH identified chlorinated volatile organic compounds in soil and groundwater. The soil and groundwater at each location was sampled and analyzed. The approximate locations of the direct push borings are shown on Figure 2 "Property Features and Soil Boring Location Diagram". Results of the Phase II ESA are presented in ERM's Report of Phase II Investigation, dated May 25, 2010, which is included in Appendix C. Refer to the attached report for additional details regarding the ERM Phase II Investigation.

##### **3.1.3 SME Phase II ESA – December 2010**

SME conducted a Phase II ESA of the Property on December 1 and 2, 2010. SME advanced 26 direct push soil borings (SB1 through SB26) and installed and sampled 13 temporary monitoring wells in soil boring SB2, SB3, SB5, SB7, SB9, SB12, SB14, SB16, SB18, SB20, SB21, SB23, and SB24 to assess recognized environmental conditions identified in the SME Phase I ESA and to facilitate Property acquisition. The approximate locations of the direct

push borings are shown on Figure 2 “Property Features and Soil Boring Location Diagram”. The location and purpose each boring is summarized in the following table.

<b>Boring</b>	<b>Location / Purpose of Boring</b>
SB1	Northern parcel to assess potential fill material in location of former structures.
SB2	Northwest Property corner near St. Joseph River to assess potential fill material and potential for migration of contaminants to river.
SB3	Near St. Joseph River to assess potential fill material and potential for migration of contaminants to river.
SB4	Reported “tar pit” area to assess potential petroleum impact and fill material.
SB5	In manufacturing plant adjacent to oil pit to assess potential pit leakage.
SB6	In oil-stained room in manufacturing plant to assess potential seepage of oil through floor and to assess potential fill material under building from former structures.
SB7	In footprint of historical hay rack factory to assess potential fill material.
SB8	Adjacent to building and pole-mounted transformer to assess potential fill material and potential for historic polychlorinated biphenyl (PCB) leakage.
SB9 and SB10	In manufacturing plant to assess subsurface conditions in machine repair area and potential fill material in footprint of historical machine shop.
SB11 - SB13	To assess subsurface conditions near former oil storage area and TCE dumping area.
SB14	To assess subsurface conditions between reported TCE dumping area and St. Joseph River.
SB15	Adjacent to a pole-mounted transformer to assess potential for historic PCB leakage.
SB16	Near St. Joseph River to assess potential fill material and potential for migration of contaminants to river.
SB17 and SB18	In manufacturing plant adjacent to coolant catch pit to assess potential pit leakage.
SB19	In manufacturing plant to assess potential fill material from former blacksmith shop, wagon shop, and painting shop.
SB20	Adjacent to black oxide process area to assess potential leakage of containment area.
SB21	In manufacturing plant to assess former printing shop area and former gas station.
SB22	In manufacturing plant to assess former photo shop and auto garage.
SB23	In manufacturing plant to assess subsurface in area of former TCE vapor polisher.
SB24	Near St. Joseph River to assess potential fill material and potential for migration of contaminants to river.
SB25 and SB26	Eastern parking lots to assess potential fill material from former residential structures.

SME selected soil samples based on intervals with visual or olfactory observations of impact (i.e. unnatural staining, odors, presence of debris, etc.) or positive photoionization detector (PID) readings. Alternatively, if none of the above conditions was observed, a near surface soil sample was typically collected from selected borings. Soil samples for laboratory

analysis were not collected from several soil borings based on the rationale discussed in the following table below.

Boring	Rationale for Not Collecting a Soil Sample
SB4	Target tar-like substance was not encountered in the boring.
SB6	No visual, olfactory, or PID evidence of impact in the boring.
SB10	No visual, olfactory, or PID evidence of impact in the boring.
SB11	Refusal in shallow concrete did not allow for collection of a soil sample.
SB17	No visual, olfactory, or PID evidence of pit leakage in the boring.
SB24	No visual, olfactory, or PID evidence of impact in the boring. A groundwater sample was collected in lieu of a soil sample.

SME submitted a total of 21 soil samples for analysis. In addition, two duplicate soil samples and one methanol blank were submitted for quality assurance and quality control (QA/QC) purposes. The following table provides the analyses requested at each location and the rationale for each soil sample collected.

Boring and Depth	Analytical Parameters	Rationale
SB1 0'-2'	PAHs, Metals	Fill material containing cinders and slag.
SB2 0'-2'	PAHs, Metals	Fill material containing cinders and slag.
SB3 0'-2'	PAHs, Metals	Fill material containing brick, concrete, and slag.
SB5 0.5'-2.5'	VOCs, PAHs, Metals	Soil at depth coincident with bottom of oil pit.
SB7 6'-8'	VOCs, PAHs, Metals	Fill material containing brick, glass, cinders, and slag. PID reading of 5 parts per million (ppm).
SB7 10'-11'	VOCs, PAHs, Metals	PID reading of 12 ppm.
SB8 0'-2'	VOCs, PCBs	Fill material containing brick, concrete, cinders, and slag. Directly below pole-mounted transformer known to have been historically filled with PCB-containing oil.
SB9 4.5'-5.5'	PAHs, Metals	Fill material containing cinders and slag.
SB12 0.25'-2'	VOCs, PAHs	Fill material containing brick, glass, cinders, and slag. PID reading of 2.6 ppm.
SB13 0.25'-2'	VOCs, PAHs	Fill material containing cinders and slag. PID reading of 19 ppm.
SB14 0'-2'	VOCs, PAHs, Metals	Fill material containing brick and slag.
SB15 0'-2'	PCBs	Directly below pole-mounted transformer known to have been historically filled with PCB-containing oil.
SB16 0'-2'	VOCs, PAHs, Metals	Fill material containing cinders. PID reading of 2 ppm.
SB18 2'-3'	VOCs, PAHs, Metals	Fill material containing cinders and slag. PID reading of 3 ppm. Immediately below bottom of coolant catch pit.
SB19 0.5'-2.5'	PAHs, Metals	Fill material containing cinders and slag.

Boring and Depth	Analytical Parameters	Rationale
SB20 6'-7'	VOCs, PAHs, Metals	Fill material containing cinders and slag. PID reading of 3 ppm.
SB21 5'-7'	PAHs, Metals	PID reading of 2 ppm.
SB22 0.5'-2'	VOCs, PAHs, Metals	Immediately below floor slab to assess near surface conditions.
SB23 2.5'-4.5'	VOCs, PAHs, Metals	Fill material containing brick, cinders, and slag.
SB25 0.25'-2'	VOCs, Arsenic	PID reading of 3 ppm.
SB26 0.25'-2'	Arsenic	Immediately below asphalt pavement to assess near surface conditions.

Metals = Arsenic, Chromium, Copper, Lead, Mercury, Selenium, Silver, and Zinc  
 PAHs = Polynuclear Aromatic Hydrocarbons  
 VOCs = Volatile Organic Compounds  
 PCBs = Polychlorinated Biphenyls

SME installed and sampled 13 temporary monitoring wells on the Property. In addition, SME collected a field blank, a trip blank, and a duplicate groundwater sample for QA/QC purposes. The following table provides the analyses requested at each location and the rationale for each groundwater sample collected.

Temporary Well and Screen Interval	Analytical Parameters	Rationale
SB2 13.5'-18.5' SB7 6.5'-11.5' SB16 7'-12' SB24 9'-14'	VOCs, PAHs, Metals	To assess groundwater migrating toward the St. Joseph River near the Groundwater-Surface Water Interface (GSI).
SB3 10'-15'	VOCs, PAHs, Metals, Hexavalent Chromium	To assess groundwater migrating toward the St. Joseph River near the GSI.
SB5 4'-9'	VOCs, PAHs, Metals	To assess groundwater conditions below the oil catch pit.
SB9 4.5'-9.5'	VOCs, PAHs, Metals	To assess groundwater conditions below the machine repair area.
SB12 3'-8'	VOCs, PAHs, Metals	To assess groundwater conditions near the reported TCE dumping area.
SB14 7'-12'	VOCs, PAHs, Metals	To assess groundwater migrating downgradient of the reported TCE dumping area toward the St. Joseph River near the GSI.
SB18 5'-10'	VOCs, PAHs, Metals	To assess groundwater conditions below the coolant catch pit.
SB20 6'-11'	VOCs, PAHs, Metals, Hexavalent Chromium	To assess groundwater conditions near the black oxide process containment area.
SB21 5'-10'	VOCs, PAHs, Metals	To assess groundwater conditions downgradient of the former gas station.

Temporary Well and Screen Interval	Analytical Parameters	Rationale
SB23 6'-11'	VOCs, PAHs, Metals	To assess groundwater conditions near the former TCE vapor polisher area.

Metals = Arsenic, Chromium, Copper, Lead, Mercury, Selenium, Silver, and Zinc  
PAHs = Polynuclear Aromatic Hydrocarbons  
VOCs = Volatile Organic Compounds

SME submitted soil and groundwater samples collected for chemical analyses to Fibertec Environmental Services, Inc. in Holt, Michigan. The samples were analyzed by the following United States Environmental Protection Agency (USEPA) analytical methods:

- VOCs - USEPA Method 8260B
- PAHs – USEPA Method 8270C
- Arsenic, chromium (total), copper, lead, selenium, silver, and zinc) USEPA Method 6020A
- Mercury – USEPA Method 7471A
- Hexavalent Chromium – USEPA Method 7196A
- PCBs – USEPA Method 8082A

Laboratory analytical data reports and chain-of-custodies are included in Appendix F. Refer to SME's Phase II ESA Field Procedures in Appendix D for additional details on sampling and QA/QC procedures.

### **3.2 Subsurface Conditions**

Near surface fill materials were encountered in several borings on the Property from the surface or immediately below surface pavement to depths ranging from 2 to 15 feet below grade. The fill was primarily silty sand and gravel with varying amounts of debris including brick, concrete, slag, and cinders. The fill material was underlain by sand with varying amounts of silt and gravel to the terminus of the most borings, which, with few exceptions as indicated on the Soil Boring Logs in Appendix E, ranged from 8 to 16 feet below grade. At soil borings SB2, SB3, SB7, SB12, and SB13, organic silt and/or peat were encountered below the fill and sand layers at depths ranging from 7.5 to 15 feet below grade. The peat layer was penetrated at only one location (SB2). Underlying the peat at this location was silty gravel to a maximum depth explored of 20 feet below grade. Groundwater was encountered at the Property at depths ranging from 3.5 to 15 feet below ground surface. Soil boring SB11 was terminated due to refusal of the drill tooling on a shallow buried concrete slab. Refer to the Direct Push Soil Boring Logs



included in Appendix E for additional details. Stratification lines on the logs indicate a general transition between soil types, and are not intended to show an area of exact geological change.

SME evaluated soil samples in the field for evidence of environmental impact. Soil samples were screened in the field for approximate total concentrations of detectable VOCs using a portable photoionization detector (PID). Field screening results are included on the Direct Push Soil Boring Logs in Appendix E. PID readings over 5 ppm and/or chemical odors were noted at soil borings SB7, SB12, SB13, and SB20.

### 3.3 Summary of Contamination

Chemical testing results were compared to Part 201 Generic Residential Cleanup Criteria to determine if the site qualifies as a Part 201 “facility.” The results for analyses of soil and groundwater samples as part of the SME Phase II ESA are presented on Tables 1 and 2, respectively. The results for analyses of soil and groundwater samples as part of the NTH and ERM investigations are included in Appendices B and C, respectively. The following tables summarize the constituents detected in soil and groundwater at concentrations exceeding Part 201 generic residential cleanup criteria. Data from the SME, NTH, and ERM investigations are included.

#### Soil Concentrations Exceeding Part 201 Cleanup Criteria

Parameter	CAS No.	Part 201 Generic Cleanup Criteria Exceeded	Locations and Sample Depths (in feet) Exceeding Part 201 Criteria	Maximum Concentration (µg/kg)
Benzene	71432	DWP	SB13 0.25-2    SB18 2-3	290
Cis-1,2-dichloroethylene	156592	DWP	SB13 0.25-2	7,100
Ethylbenzene	100414	GSIP	B-5 0-2	490
Naphthalene	91203	GSIP	SB18 2-3	8,500
Toluene	108883	GSIP	B-5 0-2	
Trichloroethylene	79016	DWP, GSIP, SVIIC	B-5 0-2    SB12 0.25-2 B-6 0-2    SB13 0.25-2 SB/MW-1 0-1    SB14 0-2 SB7 6-8    SB23 2.5-4.5 SB8 0-2	18,000
1,2,4-Trimethylbenzene	95636	GSIP	SB13 0.25-2	700
Vinyl chloride	75014	DWP, GSIP, SVIIC	SB13 0.25-2	400
Xylenes	1330207	GSIP	B-5 0-2    SB18 2-3	730
Acenaphthene	83329	GSIP	SB18 2-3	12,000
Acenaphthylene	208968	DWP	SB18 2-3	9,100
Benzo(a)anthracene	56553	DCC	SB18 2-3	60,000
Benzo(a)pyrene	50328	DCC	B-13 0-2    SB18 2-3 SB7 6-8    SB23 2.5-4.5	50,000

Parameter	CAS No.	Part 201 Generic Cleanup Criteria Exceeded	Locations and Sample Depths (in feet) Exceeding Part 201 Criteria		Maximum Concentration (µg/kg)
Benzo(b)fluoranthene	205992	DCC	SB18 2-3		65,000
Dibenzo(a,h)anthracene	53703	DCC	SB18 2-3		5,200
Fluoranthene	206440	GSIP	B-13 0-2 SB7 6-8	SB18 2-3	140,000
Fluorene	86737	GSIP	SB18 2-3		16,000
Indeno(1,2,3-c,d)pyrene	193395	DCC	SB18 2-3		21,000
Phenanthrene	85018	DWP, GSIP	B-13 0-2	SB18 2-3	140,000
Arsenic	7440382	DWP, GSIP, DCC	B-1 0-2 B-2 8-10 B-3 12-14 B-4 12-14 B-5 0-2 B-6 0-2 B-8 0-2 B-11 6-8 B-13 0-2 SB1 0-2 SB2 0-2 SB3 0-2	SB5 0.5-2.5 SB7 6-8 SB7 10-11 SB9 4.5-5.5 SB14 0-2 SB16 0-2 SB18 2-3 SB19 0.5-2.5 SB20 6-7 SB21 5-7 SB23 2.5-4.5 SB25 0.25-2	110,000
Chromium	16065831	DWP, GSIP	SB3 0-2 SB7 6-8	SB20 6-7	87,000
Copper	7440508	GSIP	B-3 12-14 B-11 6-8	SB7 6-8 SB20 6-7	550,000
Lead	7439921	DWP, DCC	B-11 6-8 SB7 6-8	SB18 2-3 SB20 6-7	1,700,000
Mercury	7439966	DWP, GSIP	B-3 12-14 B-5 0-2 B-8 0-2 B-11 6-8 B-13 0-2 SB2 0-2	SB3 0-2 SB7 6-8 SB18 2-3 SB19 0.5-2.5 SB20 6-7 SB23 2.5-4.5	5,300
Selenium	7782492	GSIP	B-3 12-14 B-4 12-14 B-11 6-8 SB2 0-2 SB3 0-2 SB5 0.5-2.5 SB7 6-8 SB7 10-11	SB9 4.5-5.5 SB14 0-2 SB18 2-3 SB19 0.5-2.5 SB20 6-7 SB21 5-7 SB23 2.5-4.5	2,000
Silver	7440224	GSIP	B-3 12-14 B-11 6-8	B-13 0-2	3,100
Zinc	7440666	GSIP	B-3 12-14 B-5 0-2 B-9 10-12 B-11 6-8	B-13 0-2 SB7 6-8 SB20 6-7	3,800,000

DWP = Drinking Water Protection Criteria, GSIP = Groundwater Surface Water Interface Protection Criteria,  
SVIIC = Soil Volatilization to Indoor Air Inhalation Criteria, DCC = Direct Contact Criteria

**Groundwater Concentrations Exceeding Part 201 Cleanup Criteria**

Parameter	CAS No.	Part 201 Generic Cleanup Criteria Exceeded	Locations and Screen Interval (in feet) Exceeding Part 201 Criteria	Maximum Concentration (µg/L)
Trichloroethylene	79016	DWC	B-4 10-15      MW-3 8-13 MW-1S 4-9      MW-5 9-14 MW-1D 10-15    SB14 7-12	20
Vinyl chloride	75014	DWC	MW-2 7-12      SB14 7-12	3.1
Fluoranthene	206440	GSI	SB2 13.5-18.5	2.0
Arsenic	7440382	DWC	B-4 10-15      SB7 6.5-11.5 SB2 13.5-18.5	15
Copper	7440508	GSI	SB2 13.5-18.5    SB3 10-15	29
Lead	7439921	DWC, GSI	SB2 13.5-18.5    SB16 7-12 SB7 6.5-11.5      SB18 5-10 SB9 4.5-9.5        SB21 5-10 SB12 3-8	600
Zinc	7440666	GSI	SB2 13.5-18.5	380

DWC = Drinking Water Criteria, GSI = Groundwater Surface Water Interface Criteria

**3.4 Abandoned Containers**

No known abandoned aboveground storage tanks (ASTs), underground storage tanks (USTs), or abandoned containers were observed or known to be present on the Property at the time this BEA was conducted.

#### 4. LIKELIHOOD OF OTHER CONTAMINATION

Based on the results of the Phase I ESAs and limited Phase II ESA, SME identified no on-site areas of concern other than those addressed by the assessment activities described herein. The location of the soil borings and the analytical testing program were selected based on known historical uses of the Property and associated Part 201 hazardous substances that would be likely indicators of historic releases, and observations during the limited Phase II ESA investigation. SME cannot guarantee all potential contaminants or the extent of contamination has been identified. Unknown and/or undetected contamination resulting from historical activities or off site sources may be present on the Property.

## 5. CONCLUSIONS

Based on the results of SME's limited Phase II ESA, in conjunction with previous investigations by NTH and ERM summarized herein, the Property meets the definition of a "facility", as defined by Section 20101 of PA 451, Part 201, as amended, because of the presence of numerous VOCs, PAHs, and metals in soil and trichloroethylene, vinyl chloride, fluoranthene, arsenic, copper, lead, and zinc in groundwater at concentrations greater than the Part 201 Generic Residential Cleanup Criteria.

In the process of obtaining information in preparation of this BEA, procedures were followed that represent current reasonable and accepted engineering and hydrogeological practices and principles, in a manner consistent with the level of care and skill ordinarily exercised by members of these professions.

Based on subsurface, analytical, and historical data which have been collected, this BEA has been prepared to provide a basis to demonstrate the existing facility conditions at the time of purchase by the Village of Jonesville.

**6. IDENTIFICATION OF AUTHOR AND ENVIRONMENTAL PROFESSIONAL,  
DATE BEA WAS CONDUCTED, AND DATE BEA WAS COMPLETED**

The Author and Environmental Professional responsible for the conduct of this Baseline Environmental Assessment (BEA) was Mr. Brian S. Trent, P.E. Senior technical review was provided by Mr. Keith Egan, Ohio CP#259. Resumes of Mr. Trent and Mr. Egan are included in Appendix H.

This BEA was conducted on January 27, 2011 and completed on January 27, 2011 in accordance with Section 20126(1)(c)(i) of Part 201.

Contact information for Mr. Brian S. Trent, P.E. is provided below:

Brian S. Trent, P.E.  
Soil and Materials Engineers, Inc.  
4705 Clyde Park Avenue S.W.  
Grand Rapids, Michigan 49509  
Phone: (616) 406 – 1756  
Email: trent@sme-usa.com

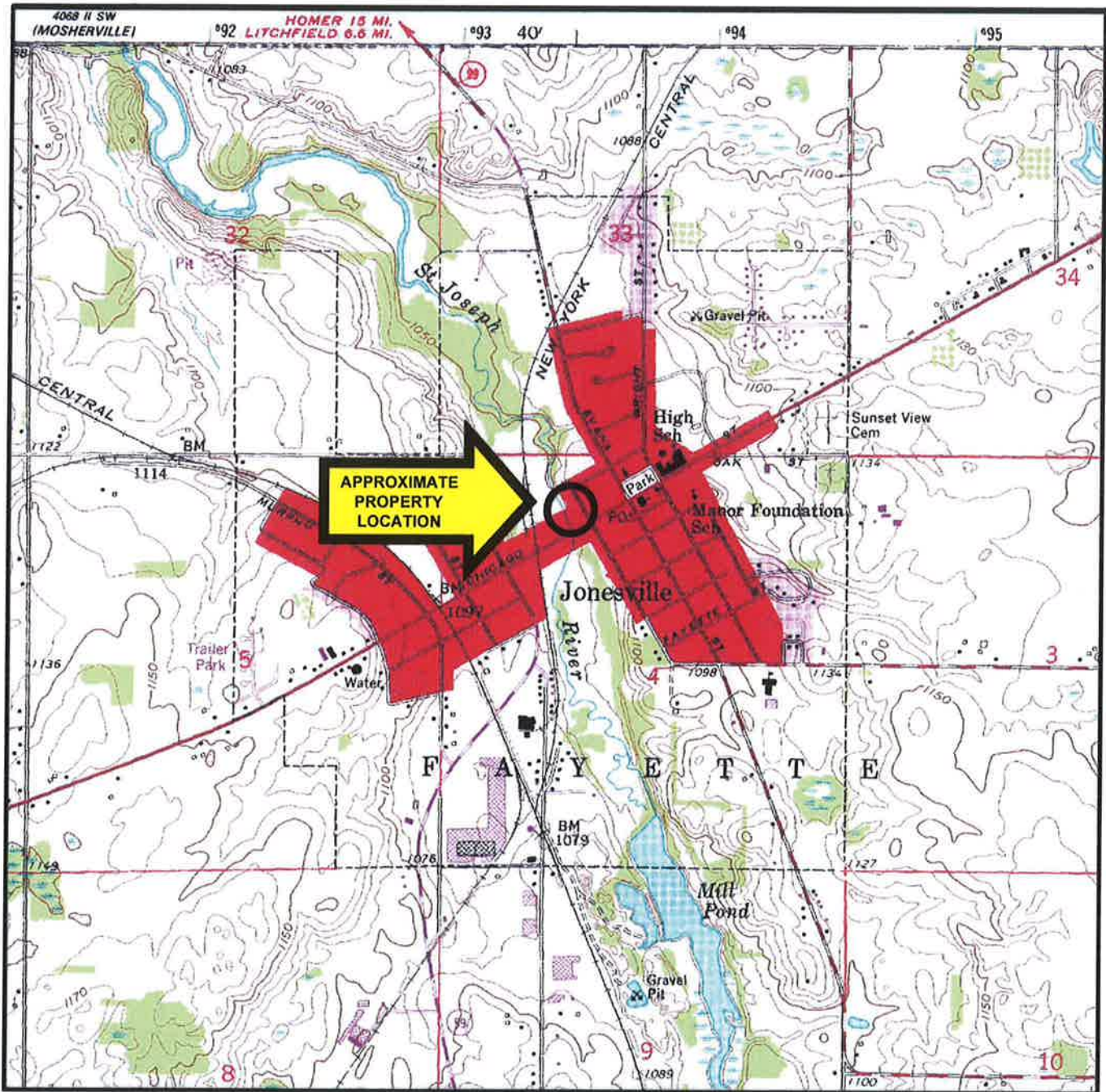
## 7. REFERENCES

1. Soil and Materials Engineers, Inc., **Phase I Environmental Site Assessment – Former Klein Tools Property, 121 Water Street, Jonesville, Michigan**, dated December 28, 2010.
2. Environmental Resources Management, **Report of Phase II Environmental Investigation, Klein Tools, Inc., 121 Water Street, Jonesville, Michigan**, dated May 25, 2010.
3. NTH Consultants, Ltd., **Phase II Environmental Site Assessment Data, Former Klein Tool Property, Jonesville, Michigan**, November 2008 data.
4. **Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and the Part 9 and Part 10 Rules**, dated December 21, 2002.
5. Michigan Department of Natural Resources and Environment (MDNRE) **Form EQP 4025, Baseline Environmental Assessment Submittal Form – Contents of a BEA Report**, dated December 2010.
6. The MDNRE, **Part 201 Generic Residential Cleanup Criteria and Screening Levels presented in the MDNRE – RRD’s Operational Memorandum No. 1**, dated January 23, 2006.

## FIGURES

- Figure 1: Property Location Map**
- Figure 2: Property Features and Soil Boring Location Diagram**
- Figure 3: Part 201 Criteria Exceedance Diagram – Soil**
- Figure 4: Part 201 Criteria Exceedance Diagram - Groundwater**





Base map obtained from USGS.

USGS QUADRANGLE(S) REFERENCED  
HILLSDALE (1979)



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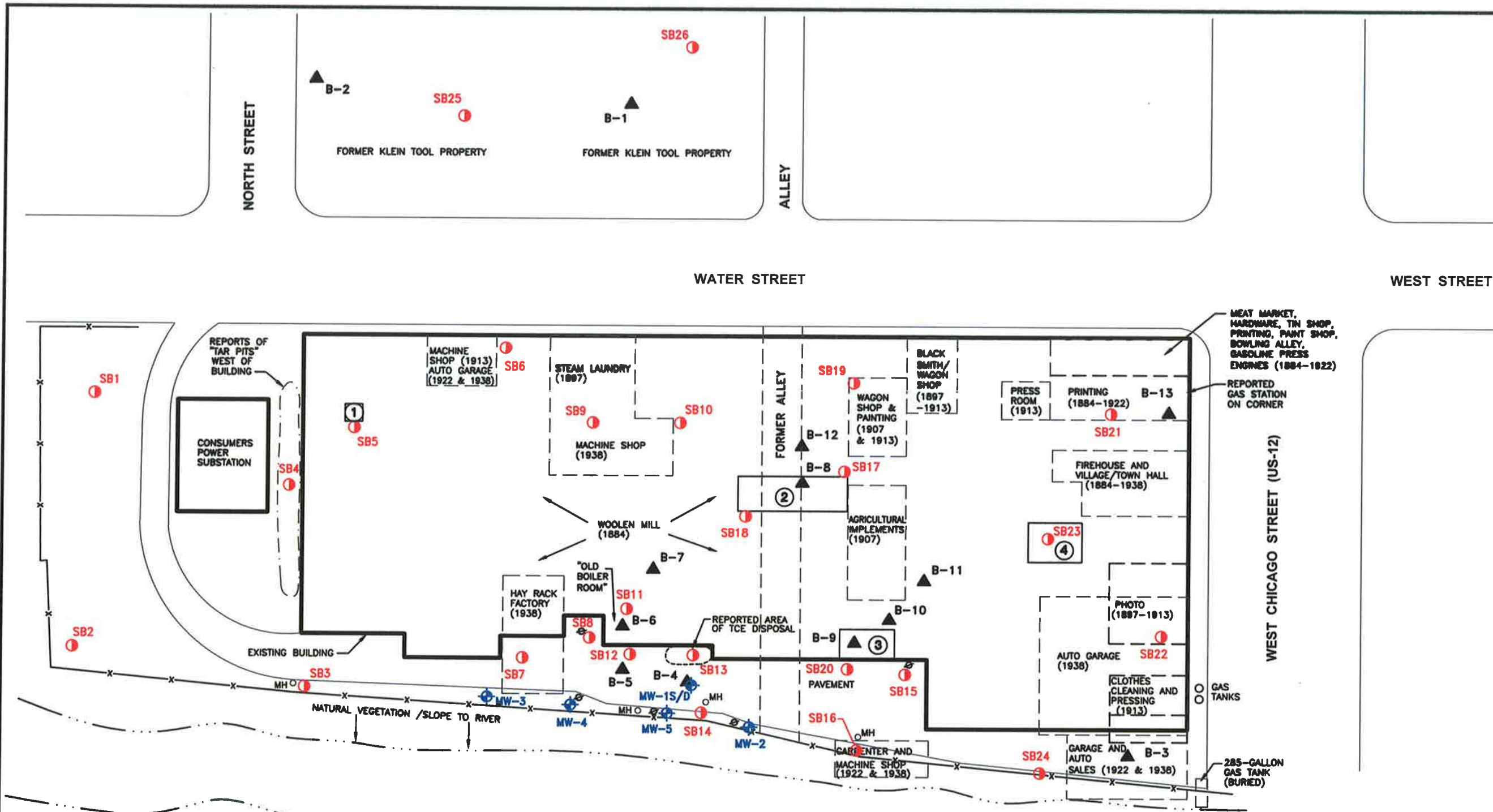


Indiana  
Michigan  
Ohio

Date	1-12-11
Drawn By	JAB
Scale	1" = 2000'
Project	LE61837A

**USGS 7.5 MINUTE TOPOGRAPHIC MAP  
FORMER KLEIN TOOL PROPERTY  
121 WATER STREET  
JONESVILLE, MICHIGAN**

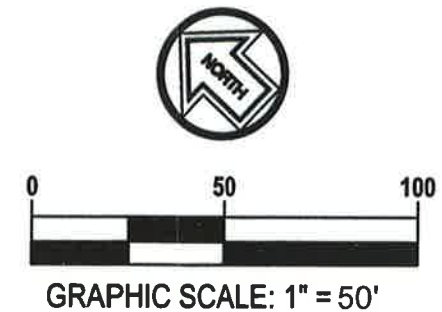
Figure No. 1



**LEGEND**

- x—x— FENCE
- - - - - EDGE OF WATER
- ⊕ POWER POLE
- MH ○ STORM WATER MANHOLE
- ⊕ ERM SOIL BORING/MONITORING WELL (MARCH 2010)
- ▲ NTH SOIL BORING (NOVEMBER 2008)
- SME SOIL BORING (DECEMBER 2010)
- ① OIL PIT
- ② COOLANT CATCH PITS
- ③ BLACK OXIDE AREA
- ④ FORMER TCE VAPOR POLISHER
- - - - - APPROXIMATE LOCATION OF HISTORICAL BUILDINGS AND USES BASED ON SANBORN FIRE INSURANCE MAPS

**NOTES:**  
 1. DRAWING INFORMATION TAKEN FROM SOIL BORING/MONITORING WELL LOCATION MAP (DATED 4-13-10) PREPARED BY ERM AND BORING LOCATION PLAN (DATED 9-5-08) PREPARED BY NTH CONSULTANTS, LTD.  
 2. SOIL BORING LOCATIONS ARE APPROXIMATE.



No.	Revision Date

**PROPERTY FEATURES AND  
 SOIL BORING LOCATION DIAGRAM  
 FORMER KLEIN TOOLS PROPERTY  
 121 WATER STREET  
 JONESVILLE, MICHIGAN**

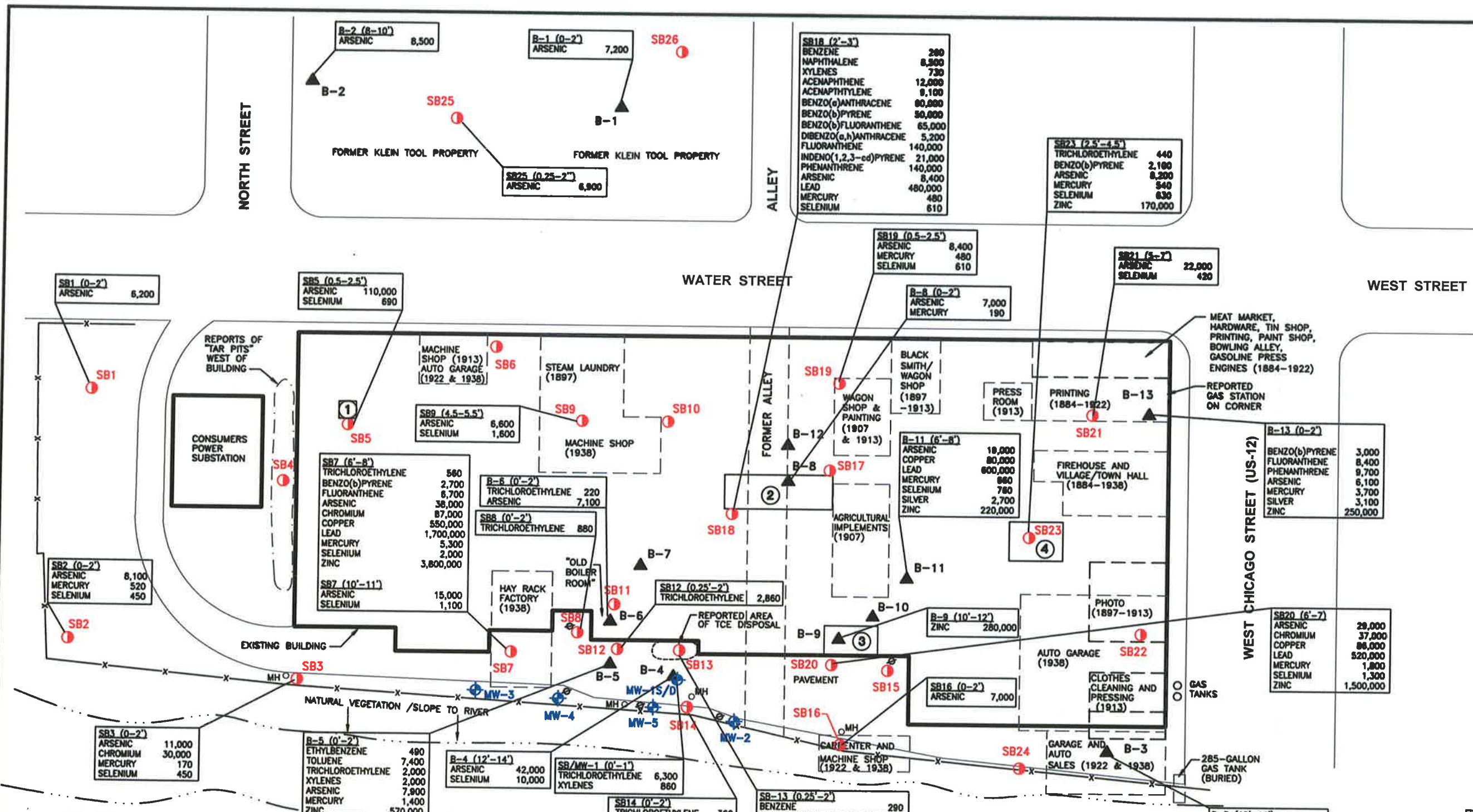
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Drawn By	JAB
Designed By	CES
Scale	1" = 50'
Project	LE 61837A

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- bay city
- grand rapids
- indianapolis
- kalamazoo
- lansing
- shelby twp.
- toledo
- traverse city



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Figure No. 2



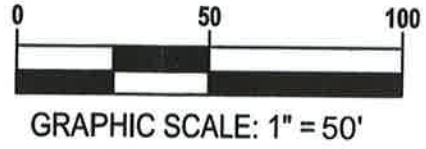
**LEGEND**

- FENCE
- - - EDGE OF WATER
- ⊕ POWER POLE
- MH ○ STORM WATER MANHOLE
- ⊕ ERM SOIL BORING/MONITORING WELL (MARCH 2010)
- ▲ NTH SOIL BORING (NOVEMBER 2008)
- SME SOIL BORING (DECEMBER 2010)

- ① OIL PIT
- ② COOLANT CATCH PITS
- ③ BLACK OXIDE AREA
- ④ FORMER TCE VAPOR POLISHER
- - - APPROXIMATE LOCATION OF HISTORICAL BUILDINGS AND USES BASED ON SANBORN FIRE INSURANCE MAPS

**NOTES:**

1. DRAWING INFORMATION TAKEN FROM SOIL BORING/MONITORING WELL LOCATION MAP (DATED 4-13-10) PREPARED BY ERM AND BORING LOCATION PLAN (DATED 9-5-08) PREPARED BY NTH CONSULTANTS, LTD.
2. SOIL BORING LOCATIONS ARE APPROXIMATE.
3. CONCENTRATIONS ARE IN MICROGRAMS PER KILOGRAM (ug/kg).
4. CONCENTRATIONS SHOWN EXCEED ONE OR MORE PART 201 GENERIC RESIDENTIAL CLEANUP CRITERIA.



No.	Revision	Date

**PART 201 CRITERIA EXCEEDANCE DIAGRAM-SOIL  
FORMER KLEIN TOOLS PROPERTY  
121 WATER STREET  
JONESVILLE, MICHIGAN**

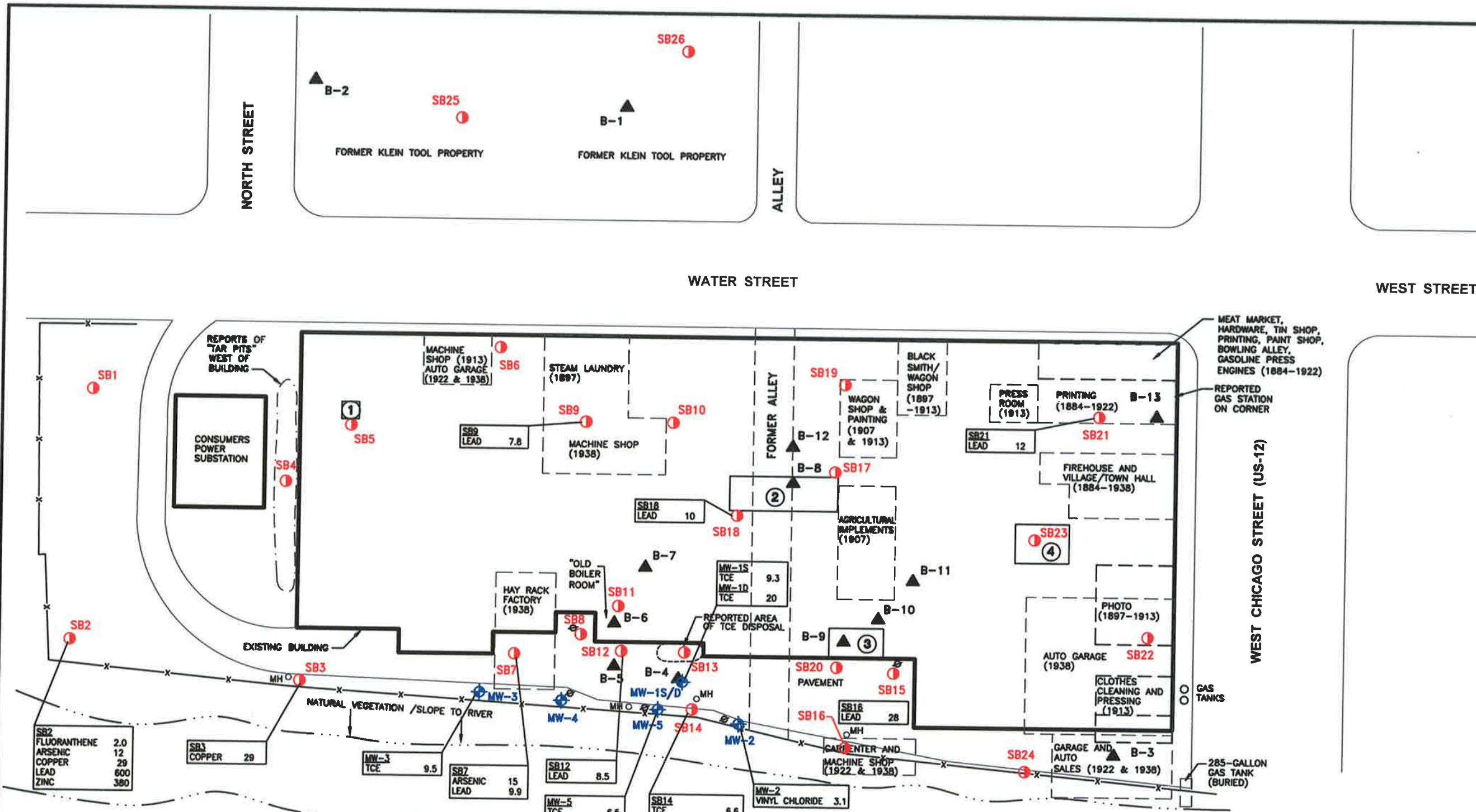
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Drawn By	JAB
Designed By	CES
Scale	1" = 50'
Project	LE 61837A

- plymouth
- bay city
- grand rapids
- indianapolis
- kalamazoo
- lansing
- shelby twp.
- toledo
- traverse city



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Figure No. 3



SB2	FLUORANTHENE	2.0
	ARSENIC	12
	COPPER	29
	LEAD	600
	ZINC	380

SB3	COPPER	29
-----	--------	----

MW-3	TCE	9.5
------	-----	-----

SB7	ARSENIC	15
	LEAD	9.9

SB12	LEAD	8.5
------	------	-----

MW-5	TCE	6.5
------	-----	-----

SB14	TCE	6.6
	VINYL CHLORIDE	3.1

MW-2	VINYL CHLORIDE	3.1
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MW-15	TCE	9.3
MW-1D	TCE	20

SB16	LEAD	28
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SB20	LEAD	28
------	------	----

SB21	LEAD	12
------	------	----

SB23	LEAD	12
------	------	----

SB24	LEAD	12
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SB25	LEAD	7.8
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SB26	LEAD	10
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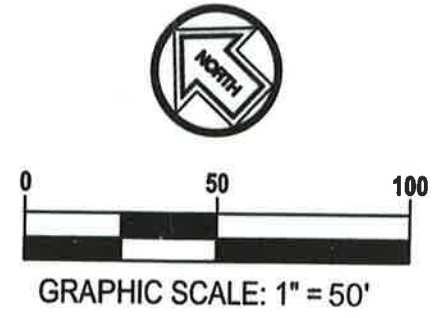
**LEGEND**

- x — FENCE
- - - - EDGE OF WATER
- ⊕ POWER POLE
- MH ○ STORM WATER MANHOLE
- ⊕ ERM SOIL BORING/MONITORING WELL (MARCH 2010)
- ▲ NTH SOIL BORING (NOVEMBER 2008)
- SME SOIL BORING (DECEMBER 2010)

- ① OIL PIT
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- ③ BLACK OXIDE AREA
- ④ FORMER TCE VAPOR POLISHER
- - - - APPROXIMATE LOCATION OF HISTORICAL BUILDINGS AND USES BASED ON SANBORN FIRE INSURANCE MAPS
- TCE TRICHLOROETHYLENE

**NOTES:**

1. DRAWING INFORMATION TAKEN FROM SOIL BORING/MONITORING WELL LOCATION MAP (DATED 4-13-10) PREPARED BY ERM AND BORING LOCATION PLAN (DATED 9-5-08) PREPARED BY NTH CONSULTANTS, LTD.
2. SOIL BORING LOCATIONS ARE APPROXIMATE.
3. CONCENTRATIONS ARE IN MICROGRAMS PER LITER (ug/L).
4. CONCENTRATIONS SHOWN EXCEED ONE OR MORE PART 201 GENERIC RESIDENTIAL CLEANUP CRITERIA.



No.	Revision Date

**PART 201 CRITERIA EXCEEDANCE DIAGRAM**  
**GROUNDWATER**  
**FORMER KLEIN TOOLS PROPERTY**  
**121 WATER STREET**  
**JONESVILLE, MICHIGAN**

Date	1-14-11
Drawn By	JAB
Designed By	CES
Scale	1" = 50'
Project	LE 61837A

- plymouth
- bay city
- grand rapids
- indianapolis
- kalamazoo
- lansing
- shelby twp.
- toledo
- traverse city



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Figure No. 4

## **TABLES**

**Table 1: Soil Analytical Results**

**Table 2: Groundwater Analytical Results**





TABLE 2  
 KLEIN TOOLS PROPERTY  
 JONESVILLE, MICHIGAN  
 GROUNDWATER ANALYTICAL RESULTS  
 SME Project No. LE61837A  
 Page 1 of 1

Constituent	CAS Number	Part 201 Groundwater Generic Residential and Commercial I Cleanup Criteria and Screening Levels				Sample ID Screen Interval (ft.) Date Collected						
		Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Groundwater Volatilization to Indoor Air Inhalation Criteria	Groundwater Contact Criteria	SB2	SB3	SB5	DUP2	SB7	SB9	SB12
						13.5'-18.5' 12/2/2010	10'-15' 12/2/2010	4'-9' 12/2/2010	SB5 Duplicate 12/2/2010	6.5'-11.5' 12/2/2010	4.5'-9.5' 12/2/2010	3'-8' 12/2/2010
<b>VOCs (ug/L)</b>												
1,1-Dichloroethane	75343	880	740	1,000,000	2,400,000	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0
cis-1,2-Dichloroethylene	156592	70	620	93,000	200,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79016	5	200***	15,000	22,000	<1.0	<1.0	1.1	1.1	1.8	<1.0	1.4
Vinyl chloride	75014	2	15	1,100	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Other Analyzed VOCs	Varies	Varies	Varies	Varies	Varies	<RL	<RL	<RL	<RL	<RL	<RL	<RL
<b>PAHs (ug/L)</b>												
Fluoranthene	206440	210	1.6	210	210	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Other Analyzed PAHs	Varies	Varies	Varies	Varies	Varies	<RL	<RL	<RL	<RL	<RL	<RL	<RL
<b>Total Metals (ug/L)</b>												
Arsenic	7440382	10	150***	NLV	4,300	12	<5.0	<5.0	<5.0	15	<5.0	7.2
Chromium, total **	7440473	100	100*	NLV	290,000,000	<10	<10	<10	<10	<10	<10	<10
Chromium, hexavalent	18540299	100	11	NLV	460,000	--	<5.0	--	--	--	--	--
Copper	7440508	1,000	13*	NLV	7,400,000	29	32	<4.0	<4.0	<4.0	7.9	<4.0
Lead	7439921	4	14*	NLV	ID	600	29	<3.0	<3.0	9.9	7.8	8.5
Mercury	7439976	2	0.0013	56	56	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Selenium	7782492	50	5	NLV	970,000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Silver	7440224	34	0.2	NLV	1,500,000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Zinc	7440666	2,400	170*	NLV	110,000,000	380	120	<50	<50	62	<50	<50

Constituent	CAS Number	Part 201 Groundwater Generic Residential and Commercial I Cleanup Criteria and Screening Levels				Sample ID Screen Interval (ft.) Date Collected						
		Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Groundwater Volatilization to Indoor Air Inhalation Criteria	Groundwater Contact Criteria	SB14	SB16	SB18	SB20	SB21	SB23	SB24
						7'-12' 12/2/2010	7'-12' 12/2/2010	5'-10' 12/2/2010	6'-11' 12/2/2010	5'-10' 12/2/2010	6'-11' 12/2/2010	9'-14' 12/2/2010
<b>VOCs (ug/L)</b>												
1,1-Dichloroethane	75343	880	740	1,000,000	2,400,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	156592	70	620	93,000	200,000	5.5	<1.0	<1.0	<1.0	<1.0	<1.0	1.2
Trichloroethylene	79016	5	200***	15,000	22,000	6.6	1.9	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75014	2	15	1,100	1,000	2.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Other Analyzed VOCs	Varies	Varies	Varies	Varies	Varies	<RL	<RL	<RL	<RL	<RL	<RL	<RL
<b>PAHs (ug/L)</b>												
Fluoranthene	206440	210	1.6	210	210	<1.0	<1.0	<1.0	<1.0	<1.2	<1.0	<1.0
Other Analyzed PAHs	Varies	Varies	Varies	Varies	Varies	<RL	<RL	<RL	<RL	<RL	<RL	<RL
<b>Total Metals (ug/L)</b>												
Arsenic	7440382	10	150***	NLV	4,300	5.3	<5.0	<5.0	<5.0	5.3	<5.0	<5.0
Chromium, total **	7440473	100	100*	NLV	290,000,000	<10	<10	<10	<10	<10	<10	<10
Chromium, hexavalent	18540299	100	11	NLV	460,000	--	<5.0	--	<5.0	--	--	--
Copper	7440508	1,000	13*	NLV	7,400,000	<4.0	<4.0	<4.0	<4.0	10	<4.0	<4.0
Lead	7439921	4	14*	NLV	ID	3.0	28	10	<3.0	17	<3.0	<3.0
Mercury	7439976	2	0.0013	56	56	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Selenium	7782492	50	5	NLV	970,000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Silver	7440224	34	0.2	NLV	1,500,000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Zinc	7440666	2,400	170*	NLV	110,000,000	<50	<50	<50	<50	<50	<50	<50

Notes:

- VOCs= Volatile Organic Compounds; PAHs = Polynuclear Aromatic Hydrocarbons.
- Concentrations reported in micrograms per liter (ug/L).
- Highlighted and bolded concentrations exceed most restrictive applicable Part 201 cleanup criteria and screening levels, where available.
- indicates that the associated parameters were not analyzed for that sample.
- Criteria taken from RRD Operational Memorandum #1, Table 1. Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening levels, dated January 23, 2006.
- Target analyte concentrations were compared to Part 201 Flammability and Explosivity Screening Levels and Acute Inhalation Screening Levels, which were not shown on this table because there were no exceedances.
- <RL - Analytical result was less than the respective reporting limit.
- ID - Insufficient data to develop criterion.
- NLV - Hazardous substance is not likely to volatilize under most conditions.
- \* - Groundwater Surface Water Interface Criterion depends on the water hardness of the receiving water. In accordance with MDNRE Operational Memo No. 5, a water hardness of 150 mg CaCO3/L was used for the waters of the southern lower peninsula of Michigan. The criteria are protective for surface water that is used as a drinking water source.
- \*\* - Total Chromium value is compared to the Chromium III criteria because Hexavalent chromium was analyzed at two groundwater sample locations at the site and was not detected in either sample.
- \*\*\* - Criterion is not protective of surface water that is used as a drinking water source.