APPENDIX A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 W. JACKSON BLVD
CHICAGO, IL 60604

MEMORANDUM

Subject: Enforcement Action Memorandum – Determination of Threat to Public Health and the Environment at the Wolverine Worldwide Tannery and House Street Disposal Site, Rockford and Plainfield Township, Kent County, Michigan (Site ID # C593)

From: Jeffrey W. Kimble, On-Scene Coordinator
Emergency Response Branch 1
Emergency Response Section 2

Through: Jason H. El-Zein, Chief
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To: Robert A. Kaplan, Acting Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum is to document the determination of an imminent and substantial threat to public health and the environment posed by hazardous waste and substances, and to authorize expenditures up to $940,139, at the Wolverine Worldwide Tannery and House Street Disposal Site in the City of Rockford and Plainfield Township, Kent County, Michigan (Site). The Site is not on the National Priorities List (NPL), but a CERCLA Preliminary Assessment was conducted in 2012 (SEMS 434898) and the Site scored high enough to be listed. Subsequently, the State of Michigan (State) asked that it not be listed and that instead, authority for the Site be transferred to Michigan for action under the State's "other cleanup authority."

II. SITE CONDITIONS AND BACKGROUND

Name: Wolverine Worldwide Tannery and House Street Disposal Superfund Site ID C593
CERCLIS ID: MIN000510613
Site Location: 123 North Main Street, Rockford, 49341, and 1855 House Street, Plainfield Township, 49306, Kent County, Michigan
Lat/Long: 43.1216003, -85.5595355 and 43.107618, -85.619421
RCRA ID: N/A
State ID: None
Potentially Responsible Parties (PRPs): Wolverine Worldwide, Inc.

NPL Status: Non NPL
Category: CERCLA Time-Critical

A. Site Description

1. Removal site evaluation

Operations on the Wolverine Worldwide, Inc. (Wolverine) former Tannery property (Tannery Property) in Rockford, Kent County, Michigan, began in approximately 1903 when G.A. Krause and his sons built a shoe factory on the northern portion of the property. The Tannery Property operations began on the southern portion of the property in approximately 1908 when Mr. Krause and his sons built the tannery to supply their shoe factory with leather. The Tannery Property used chromium as a means to tan its hides. Operations at the Tannery Property included the tanning and coloring of hides for use mainly in shoes.

Waste disposal practices in the early years of the tannery's operation are not known. Wolverine constructed a wastewater treatment plant (WWTP) at the Tannery Property sometime between 1950 and 1960. Some sludge from plant operations is known to have been disposed of in a gravel pit located several miles south of the Tannery Property. Anecdotal reports from former company workers indicate that some sludge may have been spread on at least two separate farms in the area as fertilizer. Wolverine operated a disposal site at 1855 House Street N.E. in nearby Plainfield Township (House Street Disposal Area), at which WWTP sludge and, potentially, other tannery wastes were disposed. In 2017, additional dump areas on State-owned property next to the House Street Disposal Area and another area at the intersection of House Street N.E. and Imperial Pine Drive were discovered and have been shown to have tannery scraps, drums and other waste present.

Tannery operations ceased in approximately 2009 and the buildings on the Tannery Property were demolished in 2010 and 2011. The main plant on the Tannery Property historically encompassed an area of approximately 15 acres. The Tannery Property historically consisted of the former tannery operations including: tannery buildings, the on-site WWTP, warehouse and storage buildings, and an office building. In 2012, the Michigan Department of Environmental Quality (MDEQ) and EPA completed a CERCLA Pre-Assessment Report (SEMS 434898) for the Tannery Property.

2. Physical location

The Site consists of two locations: The Tannery Property, located at 123 North Main Street in Rockford, Michigan 49341, and the House Street Disposal Area, located at 1885 House Street N.E. in Plainfield Township, Michigan 49306 (Attachment 3).

The Tannery Property is located at 123 North Main Street on the north end of the downtown district of the City of Rockford, Kent County, Michigan (T.9N., R.11W., section 36, Attachment 3). The location coordinates for the former main tannery building are latitude 43.123056° and longitude -085.560278°. The main plant site historically encompassed an area of approximately 15 acres. Commercial businesses are located to the south of the Tannery Property, residences are located to the east and north, and the Rogue River and residences are located to the west. A

recreational trail, the White Pine Trail, runs through the western portion of the Tannery Property along the bank of the Rogue River (SEMS 434898).

The former tannery operations included: tannery buildings, an on-site WWTP, warehouse and storage buildings, and an office building. The company constructed the WWTP sometime between 1950 and 1960. Some sludge from plant operations is known to have been disposed of in a gravel pit located several miles south of the Tannery Property. Tannery operations ceased in 2009 and the buildings on the Tannery Property were demolished in 2010 and 2011 (SEMS 434898).

Reportedly, Wolverine historically disposed of byproducts from its leather tanning operations at the House Street Disposal Area portion of the Site, specifically the area located at 1855 House Street N.E. in Plainfield Township, which was a licensed disposal facility authorized by the State of Michigan. This disposal area is in an area of mixed rural and residential land use. Two additional dump areas, historically part of the House Street Disposal Area, are located adjacent to the House Street Disposal Area and are currently undergoing a voluntary removal action by Wolverine at the request of MDEQ. Sampling at the two additional areas adjacent to the current House Street Disposal Area has identified hazardous substances and likely hazardous waste identified as material historically dumped by Wolverine (SEMS 937808).

An Environmental Justice (EJ) analysis for the Site was conducted. Screening of the surrounding area used Region 5's EJ Screen Tool, which applies the interim version of the national EJ Strategic Enforcement Assessment Tool (EJSEAT). Region 5 has reviewed environmental and demographic data for the area surrounding the Site and has determined there is a low potential for EJ concerns at this location.

3. Site Characteristics

The Tannery Property consists of an approximately 15-acre property in a mixed residential/commercial area. The Tannery Property is situated on the north end of the commercial downtown area of the City of Rockford. Commercial businesses are located to the south of the Tannery Property, residences are located to the east and north, and the Rogue River and residences are located to the west. A recreational trail, the White Pine Trail, runs through the western portion of the Tannery Property along the bank of the Rogue River. Rum Creek also flows through the property. The Rogue and Grand Rivers are used quite extensively for recreation and fishing. The City has a canoe/kayak launch on the east bank of the river just downstream of the Tannery Property. The City also just completed construction of a boardwalk with fishing platforms on the western bank of the river opposite the Tannery Property. Numerous environmentally sensitive resources are located in close proximity to the Tannery Property. The Tannery Property is only partially fenced, allowing public access to certain areas.

The near-surface geology in the area of the Tannery Property consists of glacial outwash sand and gravel deposits and end moraine complexes. These deposits occur as fluvial terraces along the Rogue River with the end moraine complexes flanking the river and underlying the terrace deposits. The terrace deposits range in thickness from approximately 10 to 60 feet while the moraine deposits can exceed 300 feet in thickness. The bedrock geology of the area consists of

the Red Beds and Grand River Formation. The depth to bedrock in the Tannery Property area ranges from approximately 215 to over 320 feet.

4. **Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant**

Tannery Property:

During the 2010 and 2011 demolition activities on the Tannery Property, some environmental concerns were noted, and Wolverine initiated an environmental investigation to assess three areas of concern and evaluate conditions compared to requirements in Part 201, Environmental Remediation, of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201). Wolverine installed and sampled three wells and installed five piezometers as part of this work. After reviewing findings from the initial investigation, additional samples were collected from the property and from the Rogue River. This work was done in consultation with the EPA and the MDEQ.

In 2011, after consideration of a citizen petition, EPA and MDEQ conducted a CERCLA Preliminary Assessment (PA) of the Tannery Property. PA work was subsequently initiated by MDEQ and occurred concurrently with the Wolverine assessment work.

EPA evaluated the data from these assessments. The analytical results were compared to the list of CERCLA hazardous substances at 40 CFR Part 302. Listed hazardous substances (particularly semivolatile organic compounds (SVOC) (referred to as semivolatile organic analytes (SVOA)) and inorganic compounds) were detected at levels above typical background concentrations, and at levels that exceeded applicable State action levels in all soil, groundwater and surface water sediment samples. Assessment results are summarized below by media type. The full CERCLA PA Report is included in the Administrative Record for this action.

As a result of the investigations, numerous CERCLA hazardous substances (including VOCs/VOAs, SVOCs/SVOAs, and inorganics) (listed per 40 CFR Part 302) were identified in the samples, as detailed below.

Soil:

Levels detected were compared to Part 201 Non-residential Direct Contact Criteria (NRDCC) and Groundwater Surface Water Interface Protection Criteria (GSIPC).

Arsenic (360,000 micrograms per kilogram [ug/kg]), chromium (total) (49,000,000 ug/kg), and lead (930,000 ug/kg) were detected in deep soils at concentrations exceeding NRDCC.

Several hazardous substances and/or contaminants were detected in both the deep and surficial soil samples at concentrations exceeding the GSIPC. These include: 1,2-dichlorobenzene (2,300 ug/kg); 1,4-dichlorobenzene (390 ug/kg); fluoranthene (13,000 ug/kg); phenanthrene (11,000 ug/kg); arsenic (360,000 ug/kg); barium (650,000 ug/kg); cadmium (17,000 ug/kg); chromium (total) (49,000,000 ug/kg); hexavalent chromium (17,000 ug/kg); lead (930,000 ug/kg); mercury

(total) (640 ug/kg); selenium (2,200 ug/kg); silver (450 ug/kg); zinc (1,000,000 ug/kg); ammonia (556,000 ug/kg); and cyanide (550 ug/kg) in the deep soils.

GSIPC exceedances in the surficial soil samples include: fluoranthene (5,800 ug/kg); phenanthrene (3,600 ug/kg); arsenic (11,000 ug/kg); chromium (total) (180,000 ug/kg); mercury (total) (340 ug/kg); selenium (1,200 ug/kg); silver (150 ug/kg); zinc (210,000 ug/kg); ammonia (316,000 ug/kg); and cyanide (410 ug/kg)

The data generated by the soil sampling indicate that there have been releases of contaminants to the soil on the Tannery Property. This is evidenced by contaminant concentrations above sample quantitation limits being more than three times background concentrations. Soil samples collected from the Tannery Property in three known source areas have been shown to be contaminated with elevated levels of several organic and inorganic contaminants. These soils are located at relatively shallow depths but are all in the demolished main plant area, are covered with topsoil, and are partly surrounded by a fence. However, some soils sampled from locations along the recreational trail that were once part of the Tannery Property operational area show elevated levels of organic and inorganic contaminants at or near the surface. This area is not fenced and is accessible to the general public. The fence is designed to restrict access to the Tannery Property, but because of the shallow groundwater, it does not provide a barrier to waste migration from the Tannery Property.

The potential exists for soil contamination in other portions of the main plant area of the Tannery Property based on the former tanning processes at the Property. A complete extent of contamination survey of the former tannery needs to be conducted.

Area residents are potentially at risk of direct contact to contaminated soils at the Site. Elevated levels of organic and inorganic contaminants have been detected in the surficial soils along the western side of the Tannery Property along the recreational trail and the bank of the Rogue River. The majority of the Tannery Property where the main plant buildings were located is fenced and has been covered with topsoil. The area along the trail on the western side of the Tannery Property is accessible, and the trail is used regularly by walkers and bikers.

Groundwater:

Contaminant concentrations of groundwater sample analysis results were compared to Part 201 Residential Drinking Water Criteria (RDWC) and Groundwater Surface Water Interface Criteria (GSIC). Groundwater contaminants that exceed one or both of these criteria, along with their maximum concentrations, are noted below.

Samples collected from the three initial wells in 2011 showed arsenic (37 micrograms per liter [ug/l]) and ammonia (20,000 ug/l) at levels elevated above RDWC and GSIC. Additional monitoring wells were installed and sampled by Wolverine as part of a follow up investigation. Exceedances were as follows:

Arsenic (30 micrograms per liter [ug/1]), boron (770 ug/1), iron (9,800 ug/1), vanadium

(10 ug/1), ammonia (46,000 ug/1), chloride (480,000 ug/1), and sulfates (500,000 ug/1) were detected at concentrations that exceeded the RDWC. In addition, 4-chloro-3-methylphenol (3 ug/1), arsenic (30 ug/1), chromium (total) (54 ug/1), hexavalent chromium (85 ug/1), ammonia (46,000 ug/1), and cyanide (16 ug/1) were detected at concentrations exceeding GSIC.

These results indicate a release of contaminants to the groundwater on the Tannery Property, based on the fact that contaminants likely associated with tannery process wastes are present in the groundwater samples. No background samples have been collected to date since no background monitoring wells have been installed, but given that these contaminants can be associated with tannery wastes, and the fact that the samples were collected from wells just downgradient of source areas, there is a high likelihood that these contaminants in the groundwater are the result of releases from source areas on the Tannery Property. There is also a likelihood that contaminants from historic operations on the Tannery Property may also be located in other areas of the property that have not been investigated to date.

The groundwater in the area of the Tannery Property is vulnerable to contamination from the land surface due to the highly permeable sand and gravel soils that are present. Analysis of groundwater samples collected from the Tannery Property monitoring wells have shown elevated levels of contaminants associated with tannery wastes. Groundwater is used for drinking water within a 4-mile radius of the Tannery Property (the 4-Mile Target Distance Limit (TDL)).

Surface Water and Sediment:

Sediment contaminant concentrations are also compared to the range of Part 201 Sediment Screening Levels in the table. Sediment contaminants that exceeded at least one of these screening levels are noted in the following paragraph along with their maximum concentration.

Contaminants having a maximum concentration that exceeded all screening levels include: chromium (total) (520,000 ug/kg) and mercury (total) (5,100 ug/kg). Contaminants that had concentrations that exceeded at least one screening level include: fluoranthene (620 ug/kg); pyrene (550 ug/kg); arsenic (16,000 ug/kg); cadmium (1,300 ug/kg); copper (66,000 ug/kg); lead (130,000 ug/kg); and zinc (290,000 ug/kg).

The sediment data indicate a release of contaminants above background levels to the surface water pathway. Sediments in the Rogue River have been impacted from contaminants associated with the Tannery Property. Total chromium, hexavalent chromium, and mercury have been detected in sediment samples at levels elevated above background concentrations. Contaminants from the Tannery Property can migrate to the Rogue River directly; or through Rum Creek as it passes through the Tannery Property; along the western Tannery Property boundary; or through groundwater from the Tannery Property that discharges to the river.

The 15-mile TDL includes Rum Creek through the Tannery Property, approximately seven miles of the Rogue River downstream of the Tannery Property, and eight miles of the Grand River downstream of its confluence with the Rogue River. These rivers are used for recreation and fishing. Based on citizen reports to EPA, the area directly next to the tannery on the Rogue River is a known spot for residents to launch boats for recreation, fishing, and an area that children

routinely swim in during summer months. Approximately 14.45 miles of wetlands frontage are also present along the 15-mile TDL along with several documented occurrences of state and federal threatened and endangered species. The Grand River eventually discharges into Lake Michigan outside of the 15-mile TDL.

The surface water pathway is a major exposure pathway of concern for this Tannery Property. Surface drainage in the area of the Tannery Property flows either directly into Rum Creek or the Rogue River. The Rogue River eventually discharges into the Grand River approximately seven miles downstream of the Tannery Property. See Figure 7 for the 15-Mile Target Distance Limit Map. Analysis sediment samples collected from the Rogue River adjacent to the Tannery Property showed some elevated levels of inorganic analytes including: arsenic; total chromium; hexavalent chromium; copper; lead; mercury; and zinc.

The Probable Point of Entry (PPE) of contaminants into the surface water pathway is all along Rum Creek as it passes through the Tannery Property and all along the eastern bank of the Rogue River on the west side of the Tannery Property. The furthest downstream PPE is at the southwest corner of the Tannery Property on the bank of the Rogue River.

There are no known surface water intakes along the 15-Mile TDL, but the City of Rockford historically operated an intake on the Rogue River downstream of the Tannery Property. Sensitive environmental resources along the 15-mile TDL include: six state threatened species, seven state endangered species, and two federal threatened species. These are all located downstream of the PPE and downstream of where sediment samples were collected. No Human Health or Environmental Health Consult has yet been conducted.

After the review of this data, the City of Rockford asked the State of Michigan and EPA to discontinue CERCLA investigations and allow the State to work with Wolverine on a voluntary cleanup plan for the site (SEMS 936833 and 434863). Based on the discussions at the time, EPA and MDEQ agreed to this approach but provided for the process to be reopened as needed (SEMS 434900).

House Street Disposal Area:

In 2017, waste linked to Tannery Property operations was found at two locations directly adjacent to and historically part of the House Street Disposal Area. According to MDEQ, both of these properties were part of the larger property once used as the House Street Disposal Area, most likely around the 1950s. One of these properties is now owned by the State of Michigan, Department of Transportation ("MDOT") (the "MDOT Property"). The other property is at the intersection of House Street and Imperial Pine Drive (the "Imperial Pine Drive Property").

Initial investigations on these additional properties identified wastes likely to have been dumped on it from the Tannery Property. Initial surveys revealed that dumping from the Tannery Property occurred along an old service road and next to a ravine that was likely part of the historical footprint of the House Street Disposal Area. The House Street Disposal Area is also adjacent to locations where the highest yet detected per- and polyfluoroalkyl substances (PFAS) compounds have been detected in residential drinking water (SEMS 937808).

MDOT Property:

Wolverine's consultant (Rose & Westra/GZA) and a consultant (FTC&H) for a private law firm representing concerned citizens, with staff from MDEQ observing, conducted sampling in October 2017 at the MDOT Property. During the sampling event at the MDOT Property, FTC&H, accompanied by MDEQ, observed topography and ground conditions that could be consistent with a historic access road extending from the south side of the House Street Disposal Area to an area on the MDOT Property. The observations potentially indicate the past use of the area for trench/buried waste dumping or dumping of solid or liquid waste. These observations have not yet been investigated.

Observations identified waste materials, including drums, soils, leather, bricks, glass, and other materials exposed in a ravine on the MDOT Property, on the ravine floor, and buried in the subsurface soils. Trees were observed growing on top of waste materials. By counting the annual growth rings, one tree that was cut down recently was estimated to be approximately 64 years old. A roughly 5-foot thick sequence of leather waste and soils appearing to be "ash like" was observed below the roots of the tree. A clay layer was observed in a ravine side wall at some locations. Drum, waste, and soil removal was conducted by a removal contractor hired by Wolverine.

Prior to conducting observations, FTC&H requested chemistry data for waste materials expected to be present at the MDOT Property to assist in preparing a Health and Safety Plan for use by FTCH staff while conducting observation and assessment activities. Rose & Westra/GZA did not provide any existing chemistry data to support FTC&H planned activities at the MDOT Property (SEMS 937808). Based on chemistry data for water samples that were reported for some residential wells in the area, the compounds of concern were interpreted by FTC&H to be Michigan 10 metals, VOCs, and PFAS compounds. FTC&H collected three soil/waste samples from the MDOT Property to provide a general representation of materials present.

- Sample SS-01 consisted of red-brown leather shavings that were removed from the side hill excavation.
- Sample SS-02 consisted of an ash-like material containing some gray silty-sand, some white silty-sand, and some leather fibers that were removed from the side hill excavation.
- Sample SS-03 consisted of layered tan and brown hard sludge-like or dried-adhesive material that was largely contained within a highly degraded rusted steel drum.

Arsenic

Samples SS-01, SS-02, and SS-03 contained arsenic at a concentration that exceeded the Part 201 limits for the Statewide Default Background Level (SDBL), the Drinking Water Protection Criteria (DWPC), the Groundwater-Surface Water Interface Protection Criteria (GSIPC), and the Direct Contact Criteria (DCC). Based on these exceedances for arsenic, the soil samples may represent contaminated material that could impact groundwater, surface water, and may cause unacceptable exposure to humans through direct contact with the waste/soil material. Health impacts of unacceptable human exposure to arsenic at the detected concentrations can include increased cancer risk.

Chromium
Samples SS-01, SS-02, and SS-03 exceeded the Part 201 limits for total chromium, when compared to the hexavalent chromium Part 201 criteria, including the SDBL, the DWPC, the GSIPC, and the DCC. The individual samples have not yet been analyzed to determine the actual hexavalent chromium concentrations. The samples have been resubmitted to the laboratory for analysis to determine the hexavalent chromium concentrations. As of the time of this writing, the results have not been received. Given the soil sampling effort conducted as part of this scope of work, it is possible that materials containing higher concentrations of metals than those identified from SS-01 through SS-03 may be or have been present in the waste material at the MDOT Property.

Mercury
Sample SS-02 exceeded the Part 201 general residential cleanup criteria (GRCC) for mercury including the SDBL, the DWPC, and the GSIPC. Additionally, samples SS-01 and SS-03 exceeded the Part 201 GRCC for the GSIP. Based on these exceedances for mercury, the soil samples may represent contaminated material that could cause impact to groundwater and surface water, at concentrations that may harm humans or aquatic organism through ingestion and direct contact with potentially impacted water, or through bioaccumulation.

Also detected in the sample results were:

- 1,2,4-Trichlorobenzene,
- 1,2,4-Trimethylbenzene,
- Acetone,
- n-Buytylbenzene,
- t-Amyl methyl ether (TAME),
- Toluene,
- Xylenes,
- PFAS

Concentrations of metals, and potentially VOCs, in the soil/waste at the MDOT Property exceed applicable GRCC and represent concerns for human health and the environment.

Part 201 exposure limits based on the DWPC, the GSI protection criteria, the DCC, and the Proposed Vapor Intrusion Tier I Screening Levels were exceeded. Additionally, the total chromium concentration observed in SS-02 exceeded the EPA 20x TCLP screening criteria and may represent a hazardous waste by the characteristic of toxicity (SEMS 937808).

MDOT Property and Imperial Pine Drive Property Removal:

Wolverine's contractor Rose & Westra/GZA collected composite samples from the waste at the MDOT Property and the Imperial Pine Drive Property for disposal profile analysis of the materials prior to off-site disposal at Republic Waste's Ottawa County Farms Landfill (SEMS 937642). Although the waste was classified "non-hazardous" for disposal purposes, there was

Toxicity Characteristic Leaching Procedure (TCLP) lead was identified at 3 mg/L (3,000 ug/L) in one sample from the Imperial Pine Drive Property. The samples submitted for analysis were composites of at least 4 (and likely more) different media contained within the areas being excavated and included soil, metal, leather, debris and other materials. This means that pre-excavation, any one of these individual components of the composite could have exceeded TCLP Lead for Hazardous Waste in situ if in fact the level of TCLP lead were not ubiquitous throughout all materials.

House Street Disposal Area Summary:

All future investigations of suspect areas must consider each type of waste independently to determine risk to the public, and not simply collect composite samples for disposal profiling.

Site Summary:

Due to the continued presence of hazardous substances at the Tannery Property, and the need for significant further testing at the House Street Disposal Area at which the contaminants present are likely both hazardous wastes and hazardous substances, EPA has determined that the CERCLA Assessment process should be reopened at the Tannery Property, that the House Street Disposal Area be fully assessed, and that appropriate removal and/or remedial actions be initiated at the Site. The Proposed Actions section of this Action Memorandum will discuss the next steps and work to be performed as directed by EPA.

5. NPL status

The Site is not on the NPL, but a CERCLA Preliminary Assessment was conducted at the Tannery Property, and EPA notes that based on that assessment, the Site scores high enough to be listed on the NPL.

6. Maps, pictures and other graphic representations

Attachment 3 shows the location of the Site, Site features and some previous sample locations.

B. Other Actions to Date

1. Previous actions

In 2011 and 2012, EPA, MDEQ and Wolverine conducted sampling efforts and a CERCLA Preliminary Assessment was conducted.

From 2012 to the present, Wolverine has been conducting voluntary actions and informing MDEQ of its progress in these actions.

In 2017, Wolverine and MDEQ undertook extensive work into investigating and remediating PFAS contamination in numerous locations, including the Tannery Property, the House Street

Disposal Area, and other locations where Wolverine purportedly dumped or otherwise disposed of waste in the past.

2. Current actions

The most current action at the Site has been to address the potentially widespread PFAS contamination in drinking water in the areas associated with waste from the former tannery. This Action Memorandum focuses on CERCLA hazardous substances and develops a comprehensive plan to address the CERCLA hazardous substance and hazardous waste (if and when such wastes are identified) issues at the Wolverine Worldwide Tannery Property and House Street Disposal Area Site.

State and Local Authorities' Roles

1. State and local actions to date

MDEQ has been working with Wolverine since 2012 in a Voluntary Action.

The Kent County Health Department has been working with MDEQ and Wolverine in the assessment of PFAS contamination in drinking water.

2. Potential for continued State/local response

Given the exigency of the situation, the scope of the potential investigations, the discovery of hazardous substances and likely hazardous waste in the MDOT Property and Imperial Pine Drive Property, which are adjacent to and are believed to have been historically part of the House Street Disposal Area, and wastes currently migrating from the Tannery Property to Rum Creek and the Rogue River, neither the state nor the local governments have the resources to conduct a removal action at the Site in a time critical manner.

III. THREATS TO PUBLIC HEALTH OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The conditions remaining at the Site present a substantial threat to the public health or welfare, and the environment, and meet the criteria for a time-critical removal action, pursuant to the NCP at 40 C.F.R. § 300.415(b)(2). These criteria include, but are not limited to, the following:

Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

Area residents near the Tannery Property are potentially at risk of direct contact to contaminated soils at that portion of the Site. Slightly elevated levels of organic and inorganic contaminants have been detected in the surficial soils along the western side

of the Tannery Property along the recreational trail and the bank of the Rogue River. A portion of the Tannery Property where the main plant buildings were located is fenced and has been covered with topsoil, but rainwater and surface water runoff have been observed leaving this area and entering the creek and river. The area along the trail on the western side of the Tannery Property is accessible and runoff has impacted these areas, yet additional sample data is lacking. The trail is used regularly by walkers and bikers. Additionally, the area is purportedly also used by children as a swimming hole in summer months. Sediment and water contamination has been documented in this area.

The Tannery Property is contaminated with lead, arsenic, copper, PFAS, hexavalent chrome, ammonia and other hazardous substances. The extent of hazardous substances and waste at this portion of the Site is not properly identified, but contamination exists in the soil and groundwater at this portion of the Site. Groundwater migration of hazardous substances has been documented on site, yet the pathway of groundwater flow between the Tannery Property and the municipal wellfield has not been properly assessed. Storm water may create releases of hazardous substances (or waste if identified) from the Site, as it migrates off-site. Potential exposure through each of these migration pathways could cause imminent endangerment to human health, welfare, or the environment. These pathways need to be fully assessed.

The House Street Disposal Area, and adjacent MDOT Property and Imperial Pine Drive Property locations, likely have the same type of hazardous substances and/or wastes from the Tannery Property operations. Trespassers or residents in these areas may have unrestricted access and potentially direct contact with wastes, and potential exposure to human populations and impact threats to the environment exist.

The health effects of lead are detailed by the Agency for Toxic Substance and Disease Registry as follows:

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in the body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High level exposure in men can damage the organs responsible for sperm production.

The health effects of arsenic are detailed by the Agency for Toxic Substance and Disease Registry as follows:

Breathing high levels of inorganic arsenic can cause sore throat or irritated lungs. Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea

and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso. Skin contact with inorganic arsenic may cause redness and swelling.

The health effects of copper are detailed by the Agency for Toxic Substance and Disease Registry as follows:

High levels of copper can be harmful. Breathing high levels of copper can cause irritation of the nose and throat. Ingesting high levels of copper can cause nausea, vomiting, and diarrhea. Very-high doses of copper can cause damage to the liver and kidneys, and can even cause death.

The health effects of chromium are detailed by the Agency for Toxic Substance and Disease Registry as follows:

The International Agency for Research on Cancer (IARC) has determined that chromium(VI) compounds are carcinogenic to humans. The National Toxicology Program 11th Report on Carcinogens classifies chromium(VI) compounds as known to be human carcinogens. In workers, inhalation of chromium(VI) has been shown to cause lung cancer. Mixed results have been found in studies of populations living in areas with high levels of chromium(VI) in the drinking water. In laboratory animals, chromium(VI) compounds have been shown to cause tumors to the stomach, intestinal tract, and lung (https://www.atsdr.cdc.gov/toxprofiles/tp7.pdf).

The health effects of ammonia are detailed by the Agency for Toxic Substance and Disease Registry as follows:

Ammonia is a corrosive substance and the main toxic effects are restricted to the sites of direct contact with ammonia (i.e., skin, eyes, respiratory tract, mouth, and digestive tract). For example, if you spilled a bottle of concentrated ammonia on the floor, you would smell a strong ammonia odor; you might cough, and your eyes might water because of irritation. If you were exposed to very high levels of ammonia, you would experience more harmful effects. For example, if you walked into a dense cloud of ammonia or if your skin comes in contact with concentrated ammonia, your skin, eyes, throat, or lungs may be severely burned. These burns might be serious enough to cause permanent blindness, lung disease, or death. Likewise, if you accidentally ate or drank concentrated ammonia, you might experience burns in your mouth, throat, and stomach (https://www.atsdr.cdc.gov/toxprofiles/tp126.pdf).

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

Migration of hazardous substances in groundwater due to the nature of soils at the Site has been well documented. With every rainfall, migration through the groundwater pathway exists. Many residents in the area of the House Street Disposal Area of the Site rely on well water for drinking

water, and the municipal water supply for the City of Rockford lies in the general path of the groundwater flow from the Tannery Property, approximately one mile away from that part of the Site.

Rainfall also causes storm water runoff at the Tannery Property and off-site releases have been documented. Hazardous substances have migrated to adjacent land via groundwater, and have impacted the water and sediments of Rum Creek and the Rogue River.

Actual or potential contamination of drinking water supplies or sensitive ecosystems.

All area residents within the 4-Mile TDL utilize groundwater wells for obtaining their drinking water. Residents of the City of Rockford are served by a municipal system that utilizes wells located approximately one mile southeast of the Tannery Property part of the Site. Approximately 5,484 residents are served by this system.

The remainder of the residents located within the 4-Mile TDL utilize private drinking water wells. The approximate residential population served by private wells by radius ring is listed in the table below:

Distance from Site	Estimated population served by residential wells
Mile	0
¼-½Mile	0
½- 1 Mile	269
1 - 2 Mile	3,079
Mile	7,591
Mile	8,433
Total	19,372

Heavy metals (lead, copper) and PFAS have been found in groundwater monitoring wells near the former Tannery Property and in some drinking water wells near the House Street Disposal Area.

Sediments in the Rogue River have been shown to be impacted from contaminants associated with the Tannery Property. Total chromium, hexavalent chromium, and mercury have been detected in sediment samples at levels above background concentrations. The PPE of contaminants to the river is along Rum Creek as it passes

through the Tannery Property, along its western boundary and potentially where groundwater from the Tannery Property discharges to the river. The 15-mile TDL includes Rum Creek through the Tannery Property, approximately seven miles of the Rogue River downstream of the Tannery Property, and eight miles of the Grand River downstream of its confluence with the Rogue River. These rivers are used for recreation and fishing. Approximately 14.45 miles of wetlands frontage are also present along the 15-mile TDL along with several documented occurrences of state and federal threatened and endangered species.

There are no known surface water intakes along the 15-Mile TDL, but the City of Rockford historically operated an intake on the Rogue River downstream of the Tannery Property. The Rogue and Grand Rivers are used quite extensively for recreation and fishing. The City has a canoe/kayak launch on the east bank of the river just downstream of the Site. The City also just completed construction of a boardwalk with fishing platforms on the western bank of the river opposite the Tannery Property. Approximately 14.45 miles of wetland frontage have been documented along the 15-Mile TDL. Sensitive environmental resources along the 15-mile TDL include: six state threatened species, seven state endangered species, and two federal threatened species. These are all located downstream of the PPE and downstream of where sediment samples were collected.

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate

Hazardous substances have been identified and documented in the surface soils of the Tannery Property as well as in samples from the House Street Disposal Area. Arsenic, chrome, lead and other hazardous substances have already been documented in drinking water samples from residences surrounding both areas.

Sediments in the Rogue River are already noted to be contaminated by migrating hazardous substances from the Tannery Property. Failure to address the continued migration of hazardous substances in each of the locations could further contaminate drinking water and the environment.

The availability of other appropriate federal or state response mechanisms to respond to the release.

No other federal or state response mechanism is available to respond in a timely manner given the exigencies of the situation.

IV. ENDANGERMENT DETERMINATION

Given the conditions at the Site, the nature of the known and suspected hazardous substances on Site, and the potential exposure pathways described in Sections II and III above, actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the

response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS

A. Proposed Actions

1. Proposed action description

The response actions described in this memorandum directly address actual or potential releases of hazardous substances on the Site, which may pose an imminent and substantial endangerment to public health, or welfare, or the environment. Removal activities on site will include:

a) Develop and implement a site health and safety plan to protect workers during the cleanup;

b) Develop and implement Extent of Contamination Study plans to comprehensively study the former Tannery Property (including sediments in the Rogue River and Rum Creek adjacent to the Site) and House Street Disposal Area locations and to determine the amount and location of hazardous substances and/or waste in soil, sediment, groundwater and surface water as may be present in each location;

c) Develop and implement a work plan for offsite disposal of any hazardous waste or hazardous substances that pose an Imminent and Substantial Endangerment to Human Health and the Environment as determined by the EPA On Scene Coordinator and identified during the Extent of Contamination Studies. The work plan shall include specific site controls to prevent accidental releases during removal activities and to eliminate additional off-site migration of hazardous substances;

d) Develop and implement a work plan to conduct soil gas sampling and an initial Vapor Intrusion study for residential and commercial properties near the Site based on reported historic use of TCE at the Tannery Property as a hide degreaser (SEMS 407293);

e) Develop and implement a work plan to eliminate or adequately restrict off site migration of hazardous substances via surface run off, air deposition, or groundwater flow, which exceed State contact or other appropriate criteria;

f) Place warning signs and, where not already present, fencing to limit public access to the Site;

g) Conduct personal and perimeter air monitoring and sampling during the cleanup; and

h) Ensure that all hazardous substances, pollutants or contaminants sent off-site are treated, stored, and/or disposed of in accordance with the EPA Off-Site Rule, 40 C.F.R. § 300.440.

The removal action will be conducted in a manner not inconsistent with the NCP. The On-Scene Coordinator (OSC) has initiated planning for provisions of post-removal site control consistent with the provisions of 40 C.F.R. § 300.415(l).

The response actions described in this memorandum directly address actual or threatened releases of hazardous substances, pollutants or contaminants at the facilities comprising the Site which may pose an imminent and substantial endangerment to public health and safety, and to the environment. These response actions do not impose a burden on the affected property disproportionate to the extent to which that property contributes to the conditions being addressed.

2. Contribution to remedial performance

The proposed removal action at the site will not impede future actions based on available information.

3. Engineering Evaluation/Cost Analysis (EE/CA)

Not Applicable

4. Applicable or relevant and appropriate requirements (ARARs)

All applicable, relevant and appropriate requirements (ARARs) of federal and State law will be complied with, to the extent practicable, considering the exigencies of the circumstances. On December 27, 2017, EPA sent a letter to Abigail Hendershott of the MDEQ to request Michigan ARARs. Any ARARs identified in a timely manner will be followed to the extent practicable.

5. Project Schedule

The estimated on site working days to complete the Extent of Contamination Study at each site is a total of 20 on site working days. Work to be performed based on the results of this study will be addressed in an amendment to this Action Memorandum.

Estimated Costs

The estimated costs for this site are for the Extent of Contamination Studies to be performed. Time Critical Removal Action costs for any proposed work that comes from this assessment work will be captured in an Amendment to this Action Memorandum if necessary. See Attachment 4 for an Independent Government Cost Analysis.

REMOVAL ACTION PROJECT CEILING ESTIMATE	
Extramural Costs:	

Regional Removal Allowance Costs:	
Total Cleanup Contractor Costs (This cost category includes estimates for ERRS, subcontractors, Notices to Proceed, and Interagency Agreements with Other Federal Agencies. Includes a 15% contingency)	TBD
Other Extramural Costs Not Funded from the Regional Allowance:	
Total START Labor	
Total START Analytical	
Total START Other Direct Costs	$98,240
CRL or other Regional Labs	$501,672
	$154,760
Subtotal Extramural Costs	$100,000
Extramural Costs Contingency (10% of Subtotal, Extramural Costs rounded to nearest thousand)	$854,672
TOTAL REMOVAL ACTION PROJECT CEILING	$85,467
	$940,139

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Given the conditions at the Site, the nature of the known and suspected hazardous substances on-site, and the potential exposure pathways described in Sections II and III above, actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response actions selected in this memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

For administrative purposes, information concerning the enforcement strategy for this site is contained in the Enforcement Confidential Addendum[1].

[1] Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated to be $1,524,894[2].

($940,139 + $22,000) + (58.49% x $962,139) = $1,524,894

IX. RECOMMENDATION

This decision document represents the selected removal action for the Wolverine Worldwide Tannery and House Street Disposal Site in Rockford and Plainfield Township, Kent County, Michigan, developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the Site (Attachment 1). Conditions at the Site meet the NCP criteria at 40 C.F.R. § 300.415(b) for a removal action, and I recommend your approval of the removal action proposed in this Action Memorandum. This Action Memorandum is being developed to support an Administrative Settlement Agreement and Order on Consent issued under CERCLA authorities, and it is anticipated that Wolverine will conduct the work outlined in this document.

You may indicate your approval by signing below.

Approve: Robert A. Kaplan 1/10/18
Acting Director, Superfund Division Date

Disapprove: _____
Acting Director, Superfund Division Date

Enforcement Addendum

Attachments:
1. Administrative Record Index
2. Region 5 EJ Analysis
3. Site Location and Layout Maps
4. Independent Government Cost Analysis

[2] Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of Site specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States right to cost recovery.

cc: B. Schlieger, EPA HQ (Schlieger.brian@Epa.gov)
L. Nelson, U.S. DOI, w/o Enf. Addendum, (Lindy_Nelson@ios.doi.gov)
Keith Creagh, Director, MDEQ, w/o Enf. Addendum (creaghk@michigan.gov)
Bill Schuette, Michigan AG, w/o Enf. Addendum (SchuetteB@michigan.gov)
J. Walczak, MDEQ, w/o Enf. Addendum (walczakj@michigan.gov)

bcc: J. Glover, MSS-12J, w/o Enf. Addendum
M. Johnson, ATSDR-4J, w/o Enf. Addendum
A. Lippert, Public Affairs, P-19J, w/o Enf. Addendum
T Harrison, Contracting Officer, MCC-10J, w/o Enf. Addendum
D. McGary, Contracting Officer, MCC-10J, w/o Enf. Addendum
J. Maritote, SE-5J w/o Enf. Addendum
J. El-Zein, SE-5J
D. Gray, SE-5J
T. Johnson, SE-GI
C. Norman, Delivery Order File, SA-5J
S. Chummar, Delivery Order File, SA-5J
T. Quesada, Record Center, SMR-7J
C. Ropski, SE-5J
C. Bohlen, SE-5J
S. Borries, SE-5J
J. El-Zein, SE-5J
B. Kelly, SE-GI
J. Clark, C-14J
T. Williams, C-14J

ATTACHMENT 1

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

ADMINISTRATIVE RECORD
FOR THE
WOLVERINE WORLDWIDE FORMER TANNERY SITE
ROCKFORD, KENT COUNTY, MICHIGAN

ORIGINAL
JANUARY, 2018

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	434863	4/19/12	Young, M., Rockford, City of	Walczak, J., MI Dept. of Environmental Quality	Letter re: Request that USEPA and MDEQ Terminate CERCLA-Related Activities	2
2	936833	4/19/12	Young, M., Rockford, City of	Williams, T., U.S. EPA	Letter re: Site Activities	2
3	434900	6/14/12	Devantier, D., MI Dept. of Environmental Quality	Muniz, N., U.S. EPA	Letter re: Preliminary Assessment Recommendation	2
4	434898	6/15/12	File	File	CERCLA Preliminary Assessment	150
5	937642	10/25/17	Powers, L., GZA Geoenvironmental	Vorce, K., MI Dept. of Environmental Quality	Email re: MDOT & Imperial Pine - Solid Waste	20
6	937808	11/16/17	FTC&H	File	FTC&H Technical Memorandum - Varnum LLP Soil Analytical Results	89
7	938081	12/27/17	Kimble, J., U.S. EPA	Hendershott, A., MI Dept. of Environmental Quality	Letter re: Request that the Michigan Department of Environmental Quality (MDEQ) Identify all Applicable, Relevant, and Appropriate Requirements (ARARS)	1

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
8	938079	12/28/17	File	File	Michigan's Chemical, Action and Location Specific Response Actions Summary - ARAR Table (Revision: December 28, 2017)	13
9	938080	12/28/17	Hendershott, A., MI Dept. of Environmental Quality	Kimble, J., U.S. EPA	Letter re: Applicable, Relevant, and Appropriate Requirements (ARAR)	2
10	-	-	Kimble, J., U.S. EPA	Kaplan, R., U.S. EPA	Action Memorandum re: Request for a Time-Critical Removal Action at the Wolverine Worldwide Former Tannery Site (***PENDING***)	-

ATTACHMENT 2

EJ ANALYSIS

Wolverine Worldwide Tannery and House Street Disposal Site
Rockford and Plainfield Township, Michigan

EJSCREEN Report (Version 2017)

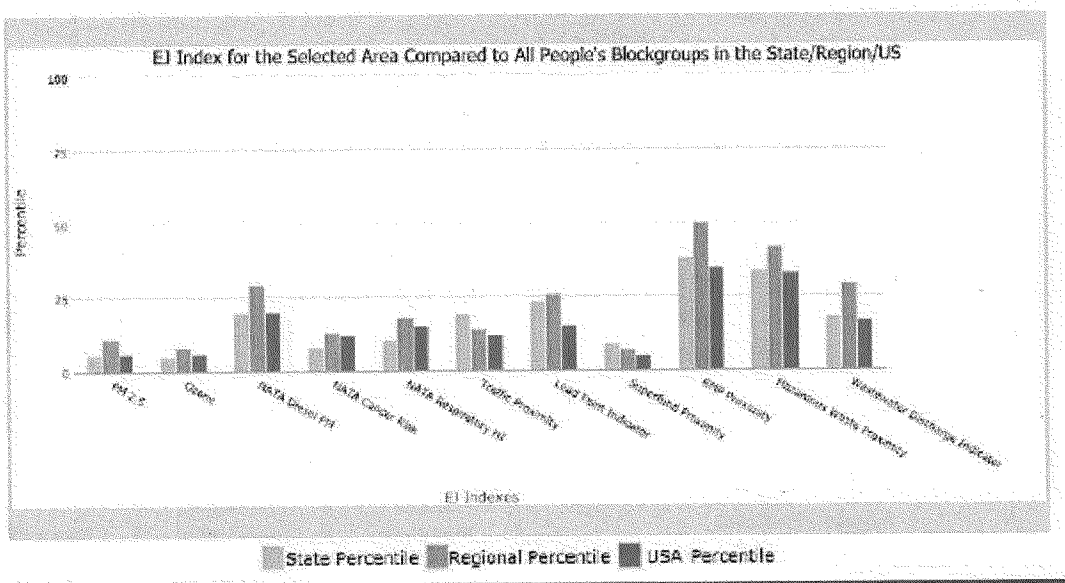
the User Specified Area, MICHIGAN, EPA Region 5

Approximate Population: 21,869

Input Area (sq. miles): 33.21

Wolverine Worldwide

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	6	11	6
EJ Index for Ozone	5	8	6
EJ Index for NATA* Diesel PM	20	29	20
EJ Index for NATA* Air Toxics Cancer Risk	8	13	12
EJ Index for NATA* Respiratory Hazard Index	10	18	15
EJ Index for Traffic Proximity and Volume	19	14	12
EJ Index for Lead Paint Indicator	23	26	15
EJ Index for Superfund Proximity	9	7	5
EJ Index for RMP Proximity	38	50	35
EJ Index for Hazardous Waste Proximity	34	42	33
EJ Index for Wastewater Discharge Indicator	18	29	17



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2017)

the User Specified Area, MICHIGAN, EPA Region 5

Approximate Population: 21,869

Input Area (sq. miles): 33.21

Wolverine Worldwide

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	9.22	9.14	35	10.1	16	9.14	46
Ozone (ppb)	40.2	38.1	89	37.6	94	38.4	76
NATA* Diesel PM (µg/m³)	0.392	0.726	31	0.932	<50th	0.938	<50th
NATA* Cancer Risk (lifetime risk per million)	28	31	36	34	<50th	40	<50th
NATA* Respiratory Hazard Index	1.1	1.3	35	1.7	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	180	570	53	370	64	590	60
Lead Paint Indicator (% Pre-1960 Housing)	0.14	0.39	25	0.39	26	0.29	42
Superfund Proximity (site count/km distance)	0.12	0.14	73	0.13	75	0.13	71
RMP Proximity (facility count/km distance)	0.069	0.51	12	0.81	5	0.73	8
Hazardous Waste Proximity (facility count/km distance)	0.014	0.072	17	0.091	9	0.093	11
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.00045	0.16	67	4.2	52	30	63
Demographic Indicators							
Demographic Index	11%	30%	14	29%	17	36%	10
Minority Population	5%	24%	22	25%	25	38%	12
Low Income Population	17%	35%	23	33%	27	34%	25
Linguistically Isolated Population	0%	2%	61	2%	58	5%	44
Population With Less Than High School Education	4%	10%	21	11%	24	13%	21
Population Under 5 years of age	7%	6%	69	6%	65	6%	63
Population over 64 years of age	12%	15%	40	14%	44	14%	48

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

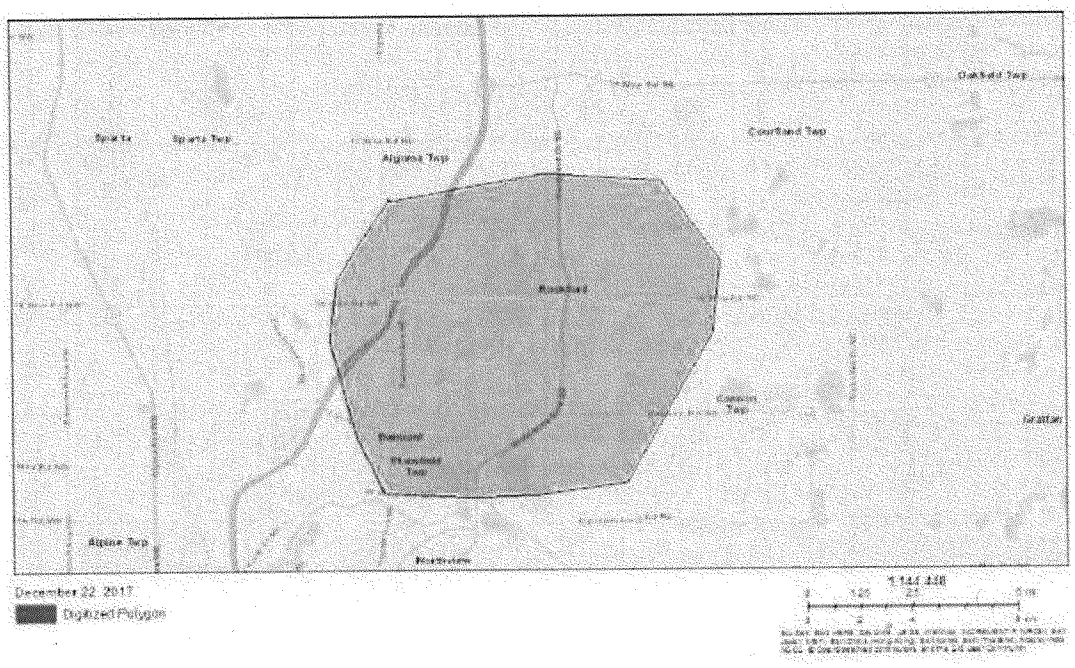
EJSCREEN Report (Version 2017)

the User Specified Area, MICHIGAN, EPA Region 5

Approximate Population: 21,869

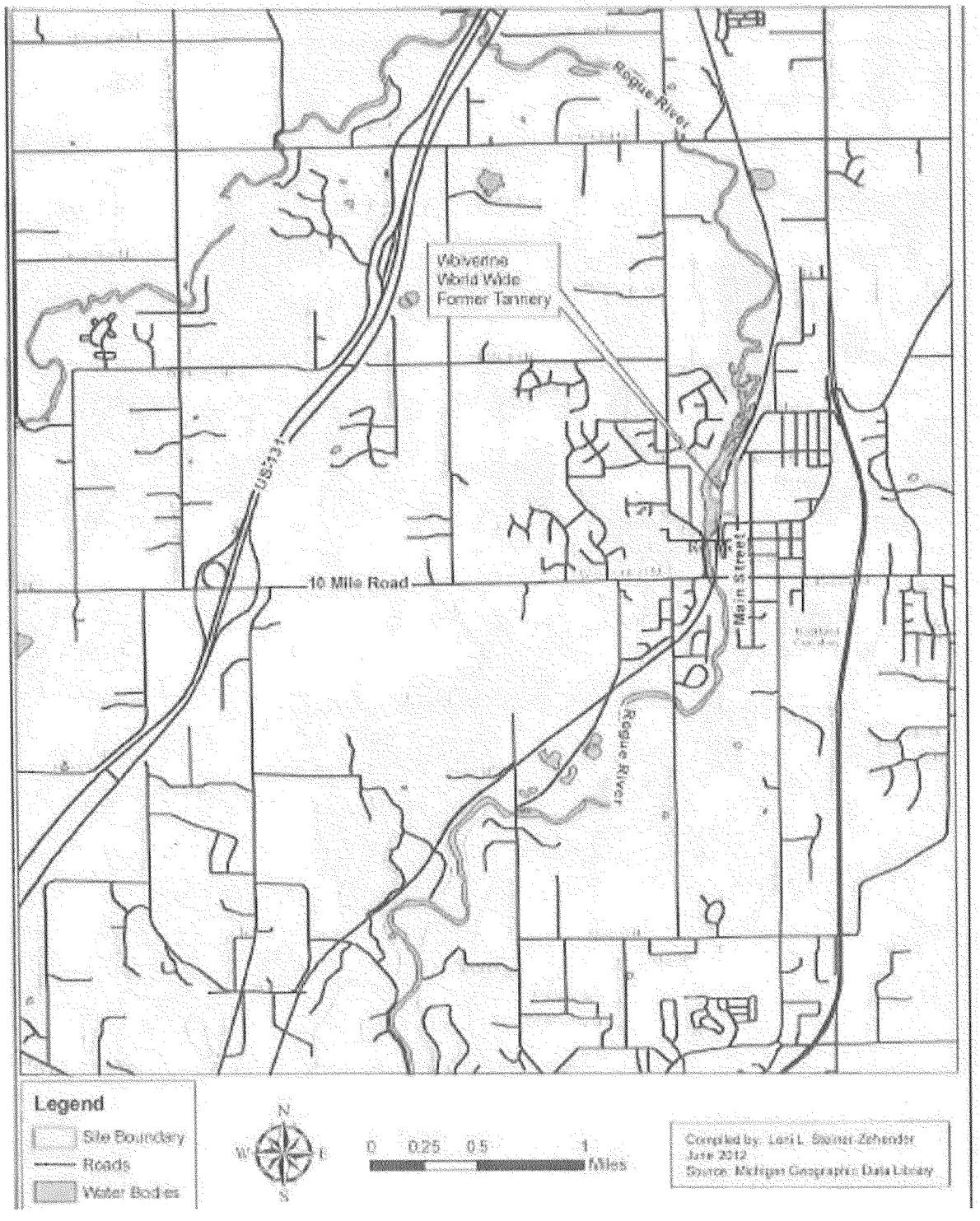
Input Area (sq. miles): 33.21

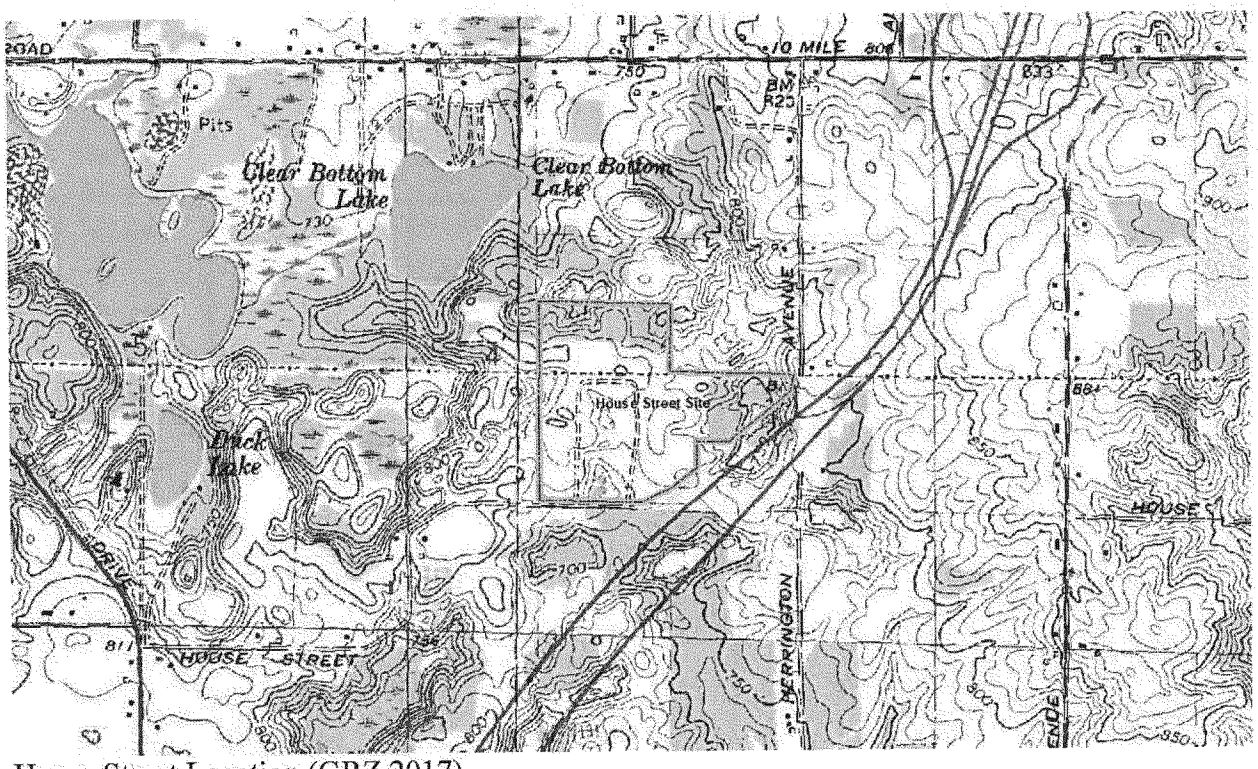
Wolverine Worldwide



ATTACHMENT 3

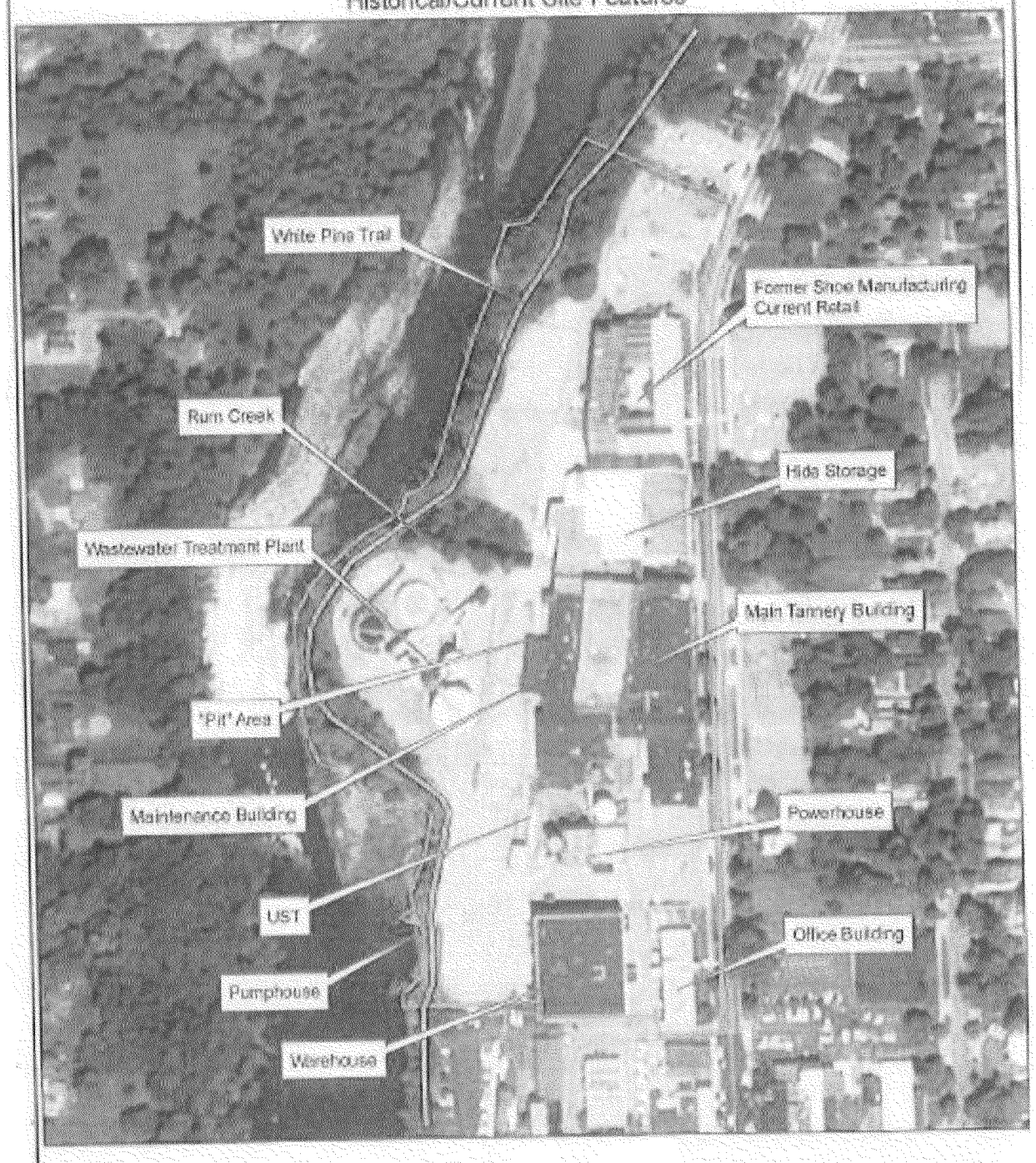
SITE LOCATION AND LAYOUT MAPS





House Street Location (GRZ 2017)

Historical/Current Site Features



Legend

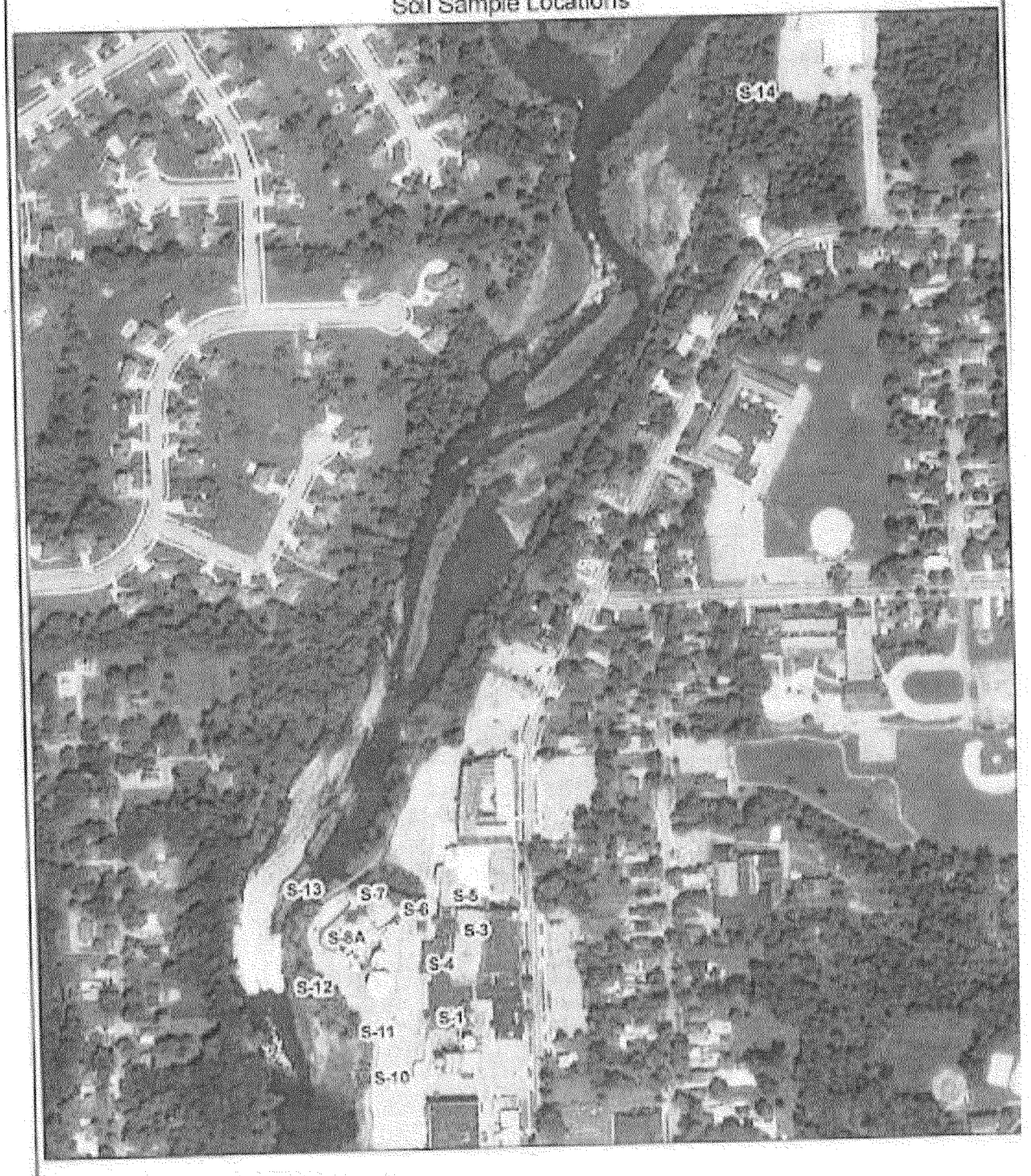
- White Pine Trail
- Site Boundary

N W E S

0 75 150 300 450 Feet

Compiled by: Lani Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library

Soil Sample Locations



Legend

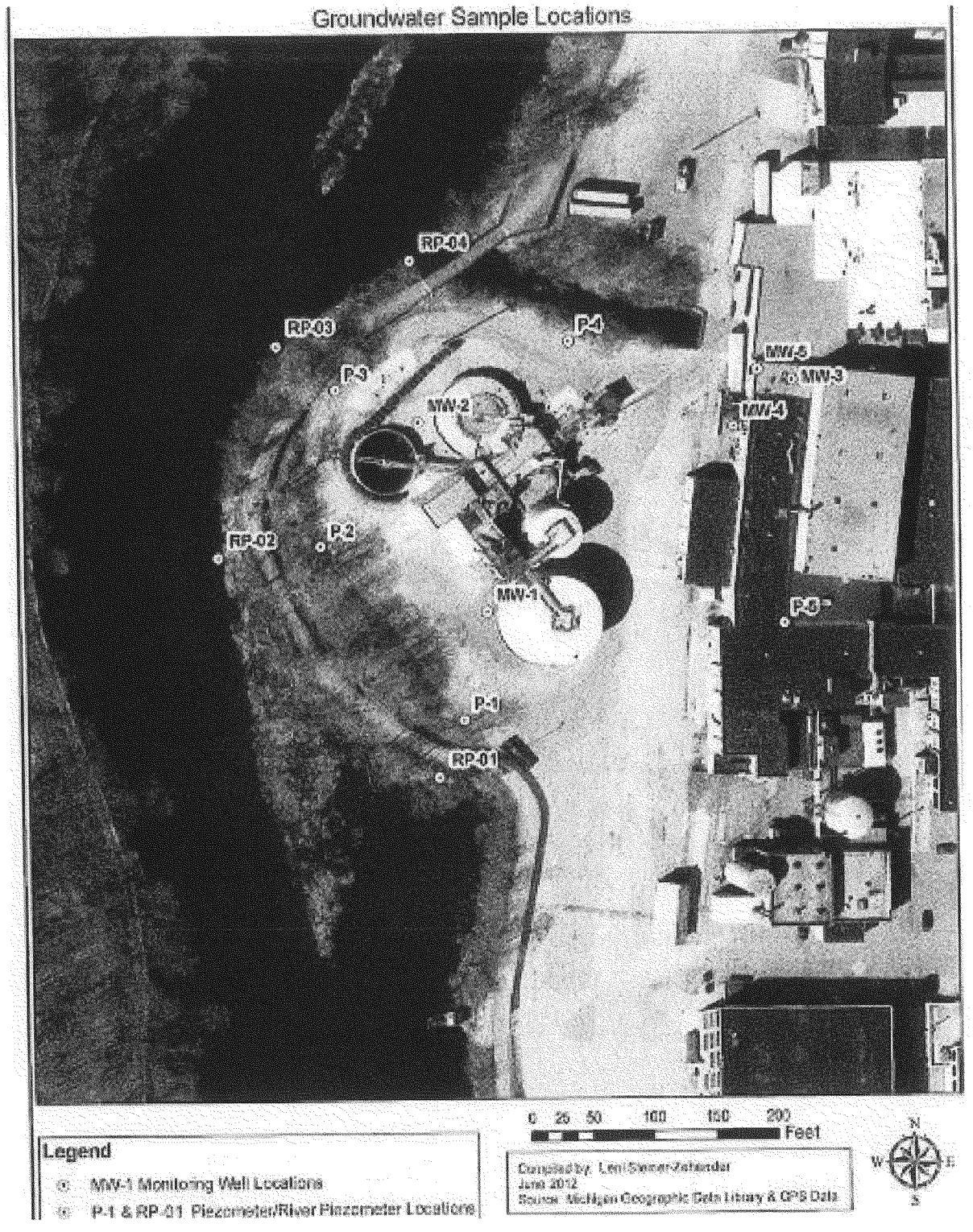
S-1 Soil Sample Locations

N W E S

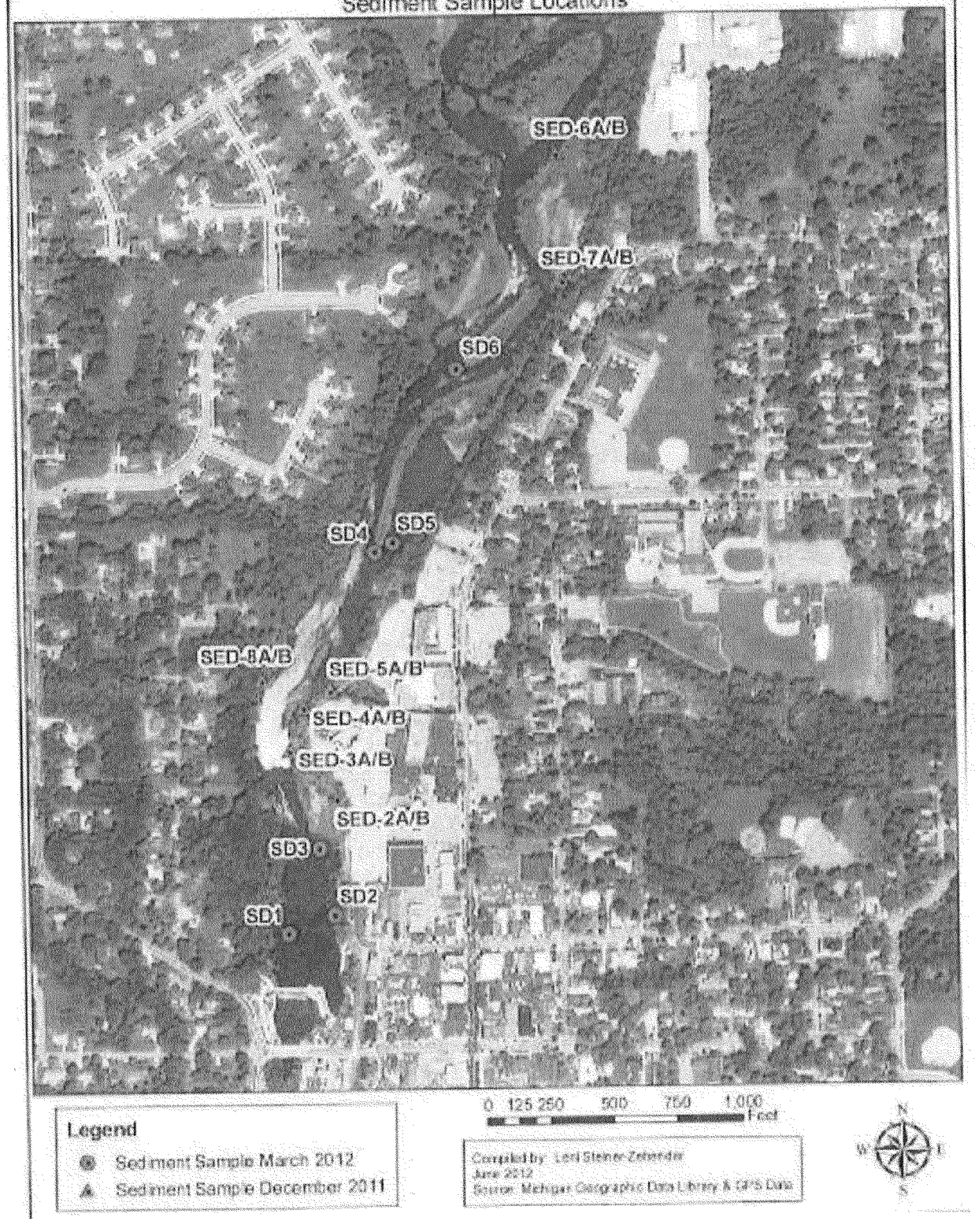
0 125 250 500 750 Feet

Compiled by: [illegible]
June 2012
Source: Michigan Geographic Data Library & DPS Data

Groundwater Sample Locations



Sediment Sample Locations



ATTACHMENT 4
Independent Government Cost Analysis

Wolverine Worldwide Tannery and House Street Disposal Site
Rockford and Plainfield Township, Michigan
January 2018

Government Independent Cost Analysis

		Amount	Cost	Total
Background and Planning	Project Management	16 hours	$130 hr	$2,080
	Lead START	40 hours	$100 hr	$4,000
	Labor	160 hours	$75	$12,000
			Total	$18,080
Tannery Site	Project Management	16 hours	$130 hr	$2,080
	Lead START	40 hours	$100 hr	$4,000
	Labor	400 hours	$75	$30,000
	Chemist/QAQC	100 hours	$100	$4,000
	Lodging	4 X 10 days	$172 a day	$6,880
	Equipment rental	lot	$8,000	$8,000
	Subcontract (geotech)	lot	$35,000	$35,000
	Analytical-			
	20 soil borings	3 soil samples per bore	$1,156 per sample	$69,360
		2 water samples per bore	$1,084 per sample	$43,360
	5 monitoring wells	5 soil samples per install	$1,156 per sample	$28,900
		3 water samples per install	$1,084 per sample	$16,260
	sediment samples	48	$1156 per sample	$55,488
	surface water samples	16	$1,084 per sample	$17,344
			Tannery Total	$320,672
House Street Site	Project Management	16 hours	$130 hr	$2,080
	Lead START	40 hours	$100 hr	$4,000
	Labor	400 hours	$75	$30,000
	Chemist/QAQC	100 hours	$100	$4,000
	Lodging	4 X 10 days	$172 a day	$6,880
	Equipment rental	lot	$8,000	$8,000
	Subcontract (sonic rig)	lot	$90,000	$90,000
	Analytical-			
	10 deep soil borings	5 soil samples per bore	$1,156 per sample	$57,800
		5 water samples per bore	$1,084 per sample	$54,200
	20 geoprobe locations	5 soil samples per	$1,156 per sample	$115,600
		2 water samples per	$1,084 per sample	$43,360
			House St. Total	$415,920
CRL or other EPA labs			Total	$100,000

EPA direct costs = 400 hours X $55 = $22,000