August 20, 2018

Mr. Paul Bucholtz
Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Constitution Hall
525 West Allegan Street
Lansing, MI 48909

RE: Surface Soil, Stockpile, and Soil Vapor Evaluation
RACER Trust Hemphill Road Industrial Land, Burton, Michigan
FILE: 15388 / 68544

Dear **Mr. Bucholtz:**

On behalf of RACER Trust, O'Brien & Gere Engineers, Inc. (OBG) has prepared this letter to provide a proposed scope of work for conducting a surface soil evaluation for lead impacts, an evaluation on the existing soil stockpile at the Site, and a soil vapor evaluation at the Hemphill Road Industrial Land, located in Burton Michigan (Site; **Figure 1**).

SITE DESCRIPTION

The Hemphill Road Industrial Land Site is located at the southeast corner of the South Saginaw Street and Hemphill Road intersection in Genesee County, Burton, Michigan (**Figure 1**). The Site is the 7.8-acre western portion of the former Hemphill Landfill and is presently an unused lot with portions covered with asphalt concrete, soil, or gravel. The Site is bounded to the north by Hemphill Road, on the west by an active service station, medical center, and South Saginaw Street, on the east by an open field (privately owned), and on the south by Storage One (commercial property).

Prior to 1941 the property was used for agricultural purposes. As part of the municipal Hemphill Landfill, a portion of the Site was filled with industrial and municipal wastes from sometime after 1941 to approximately 1958. Filling activities continued east of the Site until 1978. The Site was developed for commercial use beginning in 1955 with the construction of a building occupied by Kroger on the northern portion. A second building occupied by Taystee Bread was formerly located in the central portion of the Site, and a discount department store was added in the southern part of the Site in 1959.

General Motors Corporation (GMC) purchased the property in 1978. Prior to GMC purchasing the property, it was owned by the City of Burton. GMC used the property for employee parking and out-bound trailer storage. Remediation & Liability Management Company, Inc. (REALM), a wholly owned subsidiary of GMC, managed the Site from 2001 until 2009, when GMC filed for Chapter 11 bankruptcy and changed its name to Motors Liquidation Company (MLC) and continued management of the property as part of the GMC bankruptcy process. The property was transferred to the current owner, RACER Properties LLC (an entity wholly owned by RACER Trust) on March 31, 2011.

A summary of available soil data for the Site was prepared and submitted to the MDEQ on May 22, 2018, and the data for the Site was summarized in **Tables 1A** through **1E**, which are attached for reference. The results from these investigations indicated concentrations of lead above the MDEQ Part 201 Generic Nonresidential Direct

Contact criterion in the subsurface materials at depths ranging from 2 to 29 fbg within the waste fill located within the Site (see **Figure 2** for the extent of waste fill at the Site).

Table 1E summarizes the exceedances of the current or proposed criteria for the available Site soil / waste data. Based on the Site-specific comparison of relevant and applicable nonresidential criteria for soil, lead and ethylbenzene are the constituents of concern (COCs) for soil at the Site. All samples with exceedances listed in **Table 1E** are located in a waste fill area under soil, gravel, asphalt, or concrete cover and are adequately delineated.

Based on evaluation of the available soil data during our conference call on June 5, 2018, MDEQ requested that an evaluation of the lead concentrations in surface soil (defined as 0 to 6 inches below grade, or below the asphalt or concrete covering the soil surface) be evaluated based on the general lack of surficial sampling conducted at the Site and the desire to use existing surficial 6 inches of soil or existing surficial gravel, asphalt, or concrete and underlying 6 inches of material as an exposure barrier.

In addition, during our conference call on August 10, 2018, MDEQ requested that additional stockpile soil samples be collected to evaluate whether the stockpile soil can be utilized as cover soil at the Site.

The following sections provide the proposed scope of work to evaluate lead concentrations in the surface soil at the Site, and to evaluate the stockpile soil for reuse at the Site.

SURFACE SOIL SAMPLING AND ANALYSIS

To evaluate lead concentrations in the areas where waste fill exists on the Site, the following incremental sampling (IS) program is proposed. The primary objective of this proposed sampling effort is to characterize the potential lead impacts to surficial soils within the waste fill areas on the Site. Because impacts to Site soils were not likely due to localized activities occurring directly on specific areas of the Site, but rather the result of placing fill materials on the Site, some of which may have contained elevated lead concentrations, and to evaluate the direct contact exposure pathway to surface soil impacts; sampling will focus on soils in the upper 0.5 feet (6 inches) of surficial soils or the upper 6 inches of material below existing surficial gravel, asphalt, or concrete, following incremental sampling protocols.

INCREMENTAL SAMPLING

IS will be used to further characterize soil conditions in designated decision units at the Site. IS involves the unbiased collection of multiple relatively uniform aliquots of soil throughout the decision units, and combining these aliquots into a single mass. The single mass will be submitted to the laboratory for processing into a representative composite sample followed by laboratory analysis. When compared to a discrete sampling approach, IS has the potential to give more reliable and reproducible central tendency concentration estimates for a particular decision unit with fewer overall analytical samples.

DECISION UNITS

Three decision units are proposed for this IS program and were determined based on three factors: 1) the presence of waste fill placed on the Site (*i.e.*, both areas contain waste fill material), 2) the separation of the two areas of waste fill, which may have attributed to different timing; therefore, potentially different impacts in these two areas of the Site, and 3) the overall size of the southern waste fill area, which the MDEQ requested be split into two individual decision units during our August 10, 2018 conference call. **Figure 3** shows the approximate boundaries of the three proposed decision units. Each of these decision units is further discussed below:

- **Northern Waste Fill Area (Northern) Decision Unit –** The Northern decision unit includes the area containing waste fill that exists in the northern portion of the Site as the name indicates. This unit has an area of 26,251 square feet (ft^2, or approximately 0.60 acres). Based on the MDEQ IS guidance document (MDEQ,

2015), a grid of 23 feet was determined to be appropriate to establish approximately 50 incremental sampling locations (roughly a 7 by 7 grid) as shown in **Figure 3**.

- **Southern Waste Fill Area – North Portion (Southern-North Portion) Decision Unit –** The Southern-North Portion decision unit includes the area containing waste fill that exists in the northern approximate half of the southern portion of the Site as the name indicates. This unit has an area of 37,692 ft^2 (or approximately 0.87 acres). Therefore, a grid of 27 feet was determined to be appropriate to establish approximately 50 incremental sampling locations (roughly a 7 by 7 grid) as shown in **Figure 3**.
- **Southern Waste Fill Area – South Portion (Southern-South Portion) Decision Unit –** The Southern-South Portion decision unit includes the area containing waste fill that exists in the southern approximate half of the southern portion of the Site as the name indicates. This unit has an area of 38,055 ft2 (or approximately 0.87 acres). Therefore, a grid of 28 feet was determined to be appropriate to establish approximately 50 incremental sampling locations (roughly a 7 by 7 grid) as shown in Figure 3.

The Southern waste fill area and it's two decision units were the only decision units with exceedances for lead in surface soil beneath the asphalt at the Site based on the available soil sampling results for the Site, and the Southern-South Portion decision unit contained the most exceedances of the lead criteria, which supports the separation of the Northern and Southern waste fill areas, and splitting the Southern waste fill area in half forming the three decision units presented herein.

SAMPLING METHODS

IS will be performed in each decision unit following MDEQ IS guidance (MDEQ, 2015). As indicated above, an approximate 7 by 7 grid system equating to a total of approximately 50 aliquots that will be collected in each decision unit utilizing a systematic random sampling approach. By collecting samples from multiple, randomly selected locations, this sampling method helps eliminate error and address distributional heterogeneity, also referred to as grouping and segregation error.

Figure 3 presents the grids and systematic random sampling locations for each grid area. Three systematic random sampling locations denoted with an X, O, or ☐ are shown within each cell (assuming that the sampling location falls within a cell for partial cell locations) for the Southern-South Portion decision unit to allow the collection of replicate samples, in this case triplicates, to determine the precision and reproducibility of the sampling results due to contaminant variability. The locations of the Xs, Os, and ☐s were determined by random number generation in accordance with the MDEQ statistics training guidance document (MDEQ, 2002). The same systematic random sampling location denoted with a ☐ (position within each grid node) was utilized for the other two decision units. MDEQ's IS guidance indicates that "triplicates from a minimum of 10% of the [decision units] is normally recommended for IS" programs. Therefore, in accordance with the MDEQ IS guidance, we have selected the Southern-South Portion decision unit for triplicate sampling because it has the highest potential for variability based on the subsurface sampling already conducted in these three areas of the Site.

OBG will utilize a portable global positioning system (GPS) devise capable of submeter accuracy to locate the sampling locations in the field based on the established grid system shown on **Figure 3**. As stated above, because impacts to the Site soil were not likely due to localized activities, but rather the result of the waste fill materials deposited on the Site; sampling will focus on surficial soils to assess the direct contact exposure pathway. Due to the presence of asphalt (and possibly concrete) in the areas to be sampled, a hammer drill will be utilized to carefully core through the asphalt (or concrete), where present, so that the soils from 0 to 6 inches beneath the asphalt can be collected for analysis. Approximately 50 direct-push hand cores will be advanced within each decision unit, to a depth of approximately 0.5 feet below ground surface (bgs). At each boring or increment location, at least 40 grams of soil will be collected into a new clean container (*i.e.*, one- or two-gallon plastic sealable bag) from the steel core (direct-push sampler) advanced by hand. Once an aliquot is collected, sampling will continue at the next sample increment location (*i.e.*, no decontamination of the hand core is necessary because

all aliquots are being collected to form a single sample), until all 50± aliquots have been collected into the sample container. Sample aliquots will be stored in a cooler with ice until delivered to the analytical laboratory.

Sampling equipment that will be used during sampling at the Site will be decontaminated prior to use and after all 50 aliquots have been collected from a specific decision unit (and systematic random sampling location within each cell). Separate (*i.e.*, three) hand cores will be utilized to collect each of the triplicate samples to allow the collection of all three samples within each grid on the same pass across the decision unit before moving on to the subsequent cell location. Of course, each replicate sample will simply be placed in its appropriate (separate) sample container (*i.e.*, sealable bag).

SUB-SAMPLING

Once field sampling is complete, the single increment samples (containing all 50 aliquots from each decision unit and each systematic random sampling location within a decision unit when replicates are collected) will be delivered to the analytical laboratory (Merit Laboratories, Inc. of East Lansing, Michigan) for sample preparation and analyses. Laboratory sample preparation will include drying and sieving each increment sample entirely; a portion of the sample will be ground into a fine powder for metal analysis, if necessary and in accordance with the MDEQ IS guidance; and composited into one representative sample per decision unit. The laboratory will then obtain (a) representative subsample(s) from each of the processed field generated IS sample masses (single incremental samples) to form a final subsample mass (*i.e.*, the aliquot mass) to be used to complete the analytical preparation step.

QUALITY ASSURANCE AND CONTROL

Triplicate samples will be collected from the Southern Decision Unit as required by the MDEQ IS guidance in order to verify that an increment sample truly represents the decision unit. Collection of a triplicate sample allows for the calculation of relative standard deviation (RSD). Results of all three samples will be included in the final report.

CONSTITUENT OF INTEREST AND ANALYTICAL METHODS

Lead is the constituent of interest (COI) for the Site soil based on a review of the available soil/waste data for the Site; therefore, each final subsample mass (sample) will be analyzed for total lead by USEPA Method 6020A.

STOCKPILE SOIL SAMPLING AND ANALYSIS

To evaluate the suitability of the existing stockpile soils (the stockpile was created in circa 2002) for use as cover soils at the Site, OBG and RACER Trust are proposing the collection of six (6) additional soil samples to provide a total of nine (9) reference samples for the stockpile soils. In accordance with our discussions with MDEQ on August 10, 2018, the soil samples from the two borings (HP-5-99 and HP-6-99, see **Attachment A**) conducted in the area where the existing medical building was constructed and where the stockpile soils were reported to have been derived from will count as two of the nine samples associated with the stockpile and the composite sample collected in 2015 from the stockpile will count as the third existing sample for the stockpile. The six additional samples will be collected in a systematic random sampling manner utilizing the grid and sampling locations shown on **Figure 2**, and will be collected at a depth of approximately 1 to 1.5 bgs based on the approximate thickness of the stockpiled soil of 2 to 3 feet.

Each of the six stockpile soil samples will be submitted to Merit Laboratory of East Lansing, MI a National Environmental Laboratory Accreditation Conference (NELAC)-certified laboratory for RCRA metals and volatile organic compounds (VOCs) analysis by USEPA Methods 6020A, 7471B (for mercury), and 8260B, under routine chain-of-custody protocols utilizing standard turn-around times. A Level II data report will be requested from the laboratory.

SOIL VAPOR PROBE INSTALLATION / SAMPLING AND ANALYSIS

To further evaluate the VI pathway between the waste fill and off-Site properties and allow for evaluation of the need for any additional investigation and/or remedial action, the installation of four soil vapor points (at two nested probes at two locations) are proposed due west of monitoring wells OBG-MW-2 and OBG-MW-3 along the western Site property boundary (see **Figure 2**). In addition, a third set of nested soil vapor points will be installed near the center of the Southern waste fill area as shown on **Figure 2** to evaluate the potential for the accumulation of methane vapors and/or VOCs on-Site.

UTILITY CLEARANCE

Prior to advancing soil borings, Michigan's utility notification organization, MISS DIG, will be contacted at least three working days prior to initiation of field activities to locate and clear underground public utilities or subsurface features present at the Site.

SOIL VAPOR PROBE INSTALLATION

The vapor probes will be installed according to the requirements set forth in the MDEQ's May 2013 *Guidance Document for the Vapor Intrusion Pathway.*

The six soil vapor points (two each at three locations) will be advanced utilizing direct push drilling techniques (Geoprobe®). At each soil vapor sampling location, both a shallow (S) (approximately 5 fbg) and a deep (D) (approximately 10-15 fbg) sample point will be installed. The deep locations will be placed depending on the groundwater table in the area. The depth to water within OBG-MW-2S was 10.93 feet below the top of casing (or less than 7.93 fbg) and within OBG-MW-3S was 23.15 feet below the top of casing (or less than 20.15 fbg) during the October 2017 groundwater sampling event.

Continuous soil cores (as described previously) will be collected from the ground surface to the first water bearing zone to avoid installing the vapor probes below the water table at each of the probe locations. Selected soil samples may be collected to determine the USDA soil classification of the soils at the vapor probe locations to aid in the evaluation of the appropriate Tier II or III criteria to apply to the analytical data collected at the Site. In addition, the soil boring logs from the adjacent borings (OBG-MW-2S and OBG-MW-3S) will be used as a guide to place the probes. It is assumed that the shallow probe will be placed at 5 fbg, but that the deep probe depth may be adjusted upward or downward slightly to allow its placement within coarser granular soil, if observed. It is assumed that granular soil would act as preferential pathways for the migration of vapors over fine grained (silty and clayey) soil.

The vapor points will consist of a 6-inch length of double woven stainless steel wire screen attached to an appropriate length of high density polyethylene tubing.

Once the target depth is reached and soil sampling for characterization of the stratigraphy has been completed, the sampler will be withdrawn as the annular space around the sampling point is packed with glass beads approximately 6 inches above the screened interval. The remainder of the boring's annular space will be sealed to prevent ambient air infiltration between screened zones and above the shallow sampling zone to the ground surface with dry fine granular bentonite and will be hydrated at 1 ft intervals.

An approximate 1.5-ft section of 2-inch diameter PVC riser pipe will be installed as a protector casing for the soil vapor probe tubing. The extra tubing for the soil vapor probes will be placed within the protective casing and a two inch internal locking well cap will be placed and secured with a lock. Depending on the results of the VI sampling and in consultation with MDEQ, the vapor probes may either be abandoned or converted to permanent vapor probes by replacing the temporary PVC riser pipe protector casing with a flush mounted protector casing. The location of each vapor probe will be established by using a hand-held GPS surveying device capable of

measuring horizontal position to an accuracy of approximately one foot (0.3 meters) and included on a scaled map.

SAMPLE COLLECTION

Approximately 24 hours after installation, a grab soil gas sample will be collected from each vapor probe using the following procedure, assuming that a rain event does not occur between probe installation and sampling; otherwise, the sample will be collected after Site conditions dry satisfactorily. The following procedure is consistant with the MDEQ's "Standard Operating Procedure: Sampling Utilizing USEPA Method TO-15 Via Bottle-Vac® to Support Vapor Intrusion Investigations" (MDEQ, April 30, 2012) guidance document:

- Assemble the aboveground sampling equipment consisting of new connector tubing, the regulated flow meter assembly, including the pressure gauge for each sample, purging equipment, and Bottle-Vac®.
- Affix the sampling label on the Bottle-Vac®.
- Connect the aboveground sampling line to the vapor monitoring point.
- Connect the regulated flow meter assembly to sampling line.
- Connect the regulated vapor flow meter assembly to the helium sampling shroud, which will consist of a bucket outfitted with a helium inlet and outlet (for testing concentration of helium within the shroud prior to and after sample collection), and pass-through sampling line port.
- Calculate volume of air contained within the vapor point and sampling assembly up to the point where the sample will be collected and record on the field sampling form (**Attachment B**).
- Check all sampling system connections and fittings for tightness and/or obvious deterioration.
- Run all sampling lines through the helium shroud and seal the enclosure on the ground utilizing hydrated bentonite.
- Connect the sampling port line to the outside of shroud, making sure that the valve is closed.
- Calibrate the Mark helium detector model MGD-2002 or equivalent and zero for existing Site conditions.
- Connect the helium cylinder to the tracer gas inlet port. Opening the valve on the line from helium to the shroud, begin the flow of helium into the enclosure.
- Confirm the helium concentration within the enclosure using a Mark helium detector model MGD-2002 or equivalent and record the concentration prior to sampling on the field sampling form.
- Connect a 50 cubic centimeter (cc) syringe, or a personal air-sampling pump (such as a Gilian GilAir Air Sampling Pump) that is pre-calibrated to extract soil vapor at a rate of 0.1 liters per minute to the sampling port line and purge at least three volumes of air from the sampling system.
- After purging is complete, close the valve to the sampling line, disconnect the syringe or personal air-sampling pump, and close valve to the helium cylinder.
- Connect the helium detector to the sampling port, collect, and record a reading.
- If helium is detected, return to the Check All Sampling System Connections step (highlighted in yellow) and repeat the process until no helium is detected. If a leak is unable to be resolved, the sampling point may need to be decommissioned and a new one installed.

- Recheck the concentration of helium within the shroud using the helium detector, and record the reading on the field form. If helium is not detected in the shroud, identify how the helium is leaving the enclosure and return to the Seal the Enclosure step and seal the enclosure as appropriate.
- Disconnect or remove the sampling lines from the sampling enclosure leaving the flow regulator assembly and the lines connecting it into the sampling point in place.
- Open the valve on sampling line.
- Immediately connect the flow regulator assembly to the Bottle-Vac® using the quick connect adaptor and record the start time and vacuum gauge reading. The vacuum gauge should register about -28 millimeters mercury when it is first attached.
- Check every two minutes and record the time at which the vacuum gauge reaches 0 pounds per square inch.
- Calculate and confirm that the sampling rate is less than 200 ml/min. Record the flow regulator number on the field sampling form and note any sampling discrepancies in the field notes and sampling form.
- Disconnect the quick connect adaptor from the Bottle-Vac® and place paraffin on the top of the Bottle-Vac® valve.
- Confirm the container has the proper label with the sample identification information.
- Use the helium detector to take a final helium reading within the shroud, and record the reading on the sampling form.
- Remove the flow regulator from the tubing and record the regulator number on the sampling form.
- Complete the chain-of-custody paperwork.
- Return the Bottle-Vac®, adaptor, vacuum gauge, flow regulator assembly, and notes on equipment issues to the analytical laboratory for analysis, cleaning, and calibration.

During installation and sampling of the vapor probes, each location will be screened for the presence of volatile organic vapors using a PID. In addition to screening for volatile organic vapors, a Landtec GEM2000 Landfill Gas Analyzer and Extraction Monitor will be used to monitor for methane at each vapor probe following completion of the VI sampling.

For quality control purposes, a field duplicate sample will be collected from one of the two vapor probe locations. The soil gas samples will be submitted to Merit Laboratory of East Lansing, MI a NELAC-certified laboratory for analysis by USEPA Method TO-15 and under routine chain-of-custody protocols utilizing standard turn-around times. A Level II data report will be requested from the laboratory.

DECONTAMINATION PROCEDURES

Drilling and sampling equipment will arrive at the Site clean and will be decontaminated before and between sampling locations using laboratory grade detergent (*i.e.*, Alconox® or equivalent), potable water rinse, and/or high-pressure steam cleaning methods.

REPORTING

Two separate technical memorandums will be prepared to summarize the surface soil and stockpile investigations, and the VI investigation results and will be submitted to MDEQ. Each of the technical memoranda will document the investigation activities completed at the Site and will include a summary of field activities,

tables summarizing the analytical results, Site figures, soil boring logs (for the VI investigation), and laboratory report sheets.

SCHEDULE

The investigation field work will be initiated within four weeks of MDEQ approval.

If you have any questions, please feel free to contact Clifford Yantz at (313) 333-0211.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Clifford S. Yantz
Senior Hydrogeologist

cc: David Favero- RACER Trust

ATTACHMENTS:

Table 1A – Soil Analytical Results - GZA
Table 1B – Soil Analytical Results - MDNR/ERD
Table 1C – Soil Analytical Results - OBG
Table 1D – Soil Analytical Results - Insight
Table 1E – Soil Analytical Summary – Exceedances

Figure 1 – Site Location Map
Figure 2 – Soil Sample Locations and Proposed Soil Vapor Sample Locations
Figure 3 – Incremental Sampling Grid

Attachment A – Historical Sampling Figure
Attachment B – Soil Vapor (Bottle Vac®) Sample Collection Field Form

REFERENCES

MERA Operational Memorandum #18, dated December 30, 2013-Cleanup Criteria Tables.

MDEQ, 2002. Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

MDEQ, 2012. Standard Operating Procedure: Sampling Utilizing USEPA Method TO-15 Via Bottle-Vac® to Support Vapor Intrusion Investigations, April 30, 2012 guidance document

MDEQ, 2013. Remediation and Redevelopment Division, Operational Memorandum No. 1. December 30.

MDEQ, 2015. Incremental Sampling Methodology and Applications (RRD-Resource Materials-XX-2014-01) June.

OBG, 2018. Soil Data Update Report and Soil Vapor Evaluation. RACER Trust Hemphill Road Industrial Land, Burton, Michigan. May 22.

TABLES

TABLE 1-A
Hemphill Road Industrial Land, Burton, Michigan
Soil Analytical Summary - GZA

	MDEQ Criteria		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
2013	Volatilization to Indoor Air Inhalation Criteria		NLV	NLV	NLV	NLV	NLV	NLV	89,000	NLV	NLV	NLV
	Infinite Source Volatile Soil Inhalation Criteria		NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
	Finite VSIC for 5 Meter Source Thickness		NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
	Finite VSIC for 2 Meter Source Thickness		NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
	Particulate Soil Inhalation Criteria		9.10E+05	1.50E+08	2.20E+06	1.50E+08	5.90E+07	4.40E+07	8.80E+06	5.90E+07	2.90E+06	ID
	Nonresidential Direct Contact Criteria		37,000	1.30E+08	2.10E+06	1.0E+9 (D)	7.30E+07	900,000 (DD)	5.80E+05	9.60E+06	9.00E+06	6.30E+08
2017	Infinite Source Volatile Soil Inhalation Criteria		NA	NA	NA	NA	NA	NA	190nc	NA	NA	NA
	Finite VSIC for 2 Meter Source Thickness		NA	NA	NA	NA	NA	NA	3,800nc	NA	NA	NA
	Finite VSIC for 5 Meter Source Thickness		NA	NA	NA	NA	NA	NA	1,500nc	NA	NA	NA
	Particulate Soil Inhalation Criteria		7.0E+05ca	3.8E+08nc	1.7E+06ca	7.7E+06nc	1.5E+08nc	1.2E+07 (L)nc	2.3E+07nc	1.5E+09nc	2.3E+08nc	NA
	Nonresidential Direct Contact Criteria		52,000 ca	1.0E+08 (D)max	2.2E+05nc	1.0E+08 (D)max	2.5E+06nc	760,000 (L,DD)	1.5E+05 (DD)dev	1.2E+07 nc	6.7E+05nc	1.0E+08 (D) max
Sample Location	*Sample Depth*	*Date*										
MW-1	(5')*	Oct-87	17,000	30,000	<1,000	11,000	10,000	6,700	<40	2,200	<1,000	37,000
MW-1	(9.5')*	Oct-87	21,000	120,000	<1,000	5,800	<2,000	<6,000	160	<2,000	1,400	49,000
MW-1	(14')*	Oct-87	16,000	170,000	2,600	23,000	39,000	160,000	40	<2,000	2,300	98,000
MW-1	(18.5')	Oct-87	9,000	240,000	4,500	30,000	88,000	130,000	<40	4,900	2,300	680,000
S-16	(5')*	Oct-87	6,500	29,000	3,800	29,000	21,000	6,300	<40	<2,000	3,400	69,000
S-16	(10')	Oct-87	11,000	26,000	2,600	20,000	12,000	<5,000	<40	3,300	3,800	30,000
S-16	(15')	Oct-87	<2,000	40,000	3,200	25,000	19,000	<5,900	<40	3,300	3,500	210,000
S-17	(9')	Sep-87	5,300	80,000	2,200	24,000	12,000	14,000	50	<1,000	2,000	41,000
S-17	(19.5')	Sep-87	<2,000	60,000	2,700	22,000	12,000	13,000	<40	<1,000	2,600	36,000
S-17	(24.5')	Sep-87	8,900	42,000	3,300	31,000	17,000	<4,000	<40	<1,000	3,300	37,000
S-33	(2')*	Nov-87	5,400	21,000	<500	6,800	8,800	2,900	<100	<500	<500	32,000
S-33	(5')*	Nov-87	8,800	57,000	<500	14,000	14,000	5,600	<100	<500	<500	46,000
S-33	(10')	Nov-87	9,100	46,000	<500	16,000	16,000	12,000	<100	<500	<500	48,000
S-33	(14')	Nov-87	11,000	40,000	<500	12,000	12,000	6,700	<100	<500	<500	35,000
S-33	(15')	Nov-87	23,000	27,000	<500	4,000	3,500	16,000	<100	<500	<500	11,000
S-34	(6')*	Nov-87	9,500	--	na	--	20,000	130,000	na	1,600	na	93,000
S-34	(10')*	Nov-87	12,000	--	na	--	21,000	220,000	na	640	na	50,000
S-34	(14.5')*	Nov-87	12,000	--	na	--	98,000	**1,400,000**	na	820	na	140,000
S-34	(18.5')*	Nov-87	na	170,000	na	na	130,000	**770,000**	na	<500	na	190,000
S-34	(21')*	Nov-87	na	270,000	na	na	46,000	260,000	na	<500	na	200,000
S-34	(24.5')*	Nov-87	na	650,000	na	na	47,000	**850,000**	na	610	na	190,000
S-34	(30')	Nov-87	na	32,000	na	na	7,800	<5,000	na	<500	na	210,000
S-34	(35')	Nov-87	na	32,000	na	na	5,200	8,400	na	<500	na	17,000
SB-1	(5')*	Feb-88	na	17,000	na	na	6,900	6,900	na	<500	na	29,000
SB-1	(10')*	Feb-88	na	1,790,000	na	na	51,000	**1,970,000**	na	<500	na	610,000
SB-1	(14')*	Feb-88	na	800,000	na	na	38,000	520,000	na	<500	na	730,000
SB-1	(20')	Feb-88	na	48,000	na	na	7,300	12,000	na	<500	na	39,000
SB-2	(5')*	Feb-88	na	56,000	na	na	14,000	36,000	na	<500	na	100,000
SB-2	(10')*	Feb-88	na	880,000	na	na	15,000	180,000	na	<500	na	67,000
SB-2	(15')*	Feb-88	na	67,000	na	na	10,000	46,000	na	<500	na	40,000
SB-2	(25')	Feb-88	na	31,000	na	na	12,000	7,200	na	<500	na	46,000
SB-3	(5')*	Feb-88	na	54,000	na	na	13,000	25,000	na	<500	na	51,000
SB-3	(9.5')*	Feb-88	na	290,000	na	na	35,000	21,000	na	<500	na	32,000
SB-3	(15')	Feb-88	na	73,000	na	na	15,000	9,800	na	<500	na	54,000
SB-3	(20')	Feb-88	na	19,000	na	na	5,200	<5,000	na	<500	na	22,000
SB-4	(3.5')*	Feb-88	na	21,000	na	na	10,000	18,000	na	<500	na	28,000
SB-4	(10')	Feb-88	na	41,000	na	na	13,000	10,000	na	<500	na	48,000
SB-4	(15')	Feb-88	na	69,000	na	na	15,000	11,000	na	<500	na	47,000
SB-5	(5')*	Feb-88	na	12,000	na	na	3,700	5,700	na	<500	na	12,000
SB-5	(9.5')	Feb-88	na	28,000	na	na	7,300	5,300	na	<500	na	23,000
SB-5	(15')	Feb-88	na	75,000	na	na	15,000	12,000	na	<500	na	49,000
SB-6	(5')	Feb-88	na	14,000	na	na	4,500	4,900	na	<500	na	15,000
SB-6	(9')	Feb-88	na	71,000	na	na	15,000	8,400	na	<500	na	46,000
SB-6	(10')	Feb-88	na	2,800	na	na	16,000	12,000	na	<500	na	54,000
SB-7	(5')*	Feb-88	na	29,000	na	na	7,900	6,300	na	<500	na	54,000
SB-7	(9.5')	Feb-88	na	7,100	na	na	2,800	<5,000	na	<500	na	11,000
SB-7	(15')	Feb-88	na	60,000	na	na	14,000	10,000	na	<500	na	44,000
SB-8	(5')*	Feb-88	na	59,000	na	na	13,000	6,000	na	<500	na	42,000
SB-8	(10')*	Feb-88	na	30,000	na	na	9,300	11,000	na	<500	na	39,000
SB-8	(15')*	Feb-88	na	65,000	na	na	13,000	6,700	na	<500	na	52,000
SB-8	(19')*	Feb-88	na	640,000	na	na	35,000	**770,000**	na	<500	na	190,000
SB-8	(24.5')*	Feb-88	na	360,000	na	na	53,000	**3,970,000**	na	<500	na	280,000
SB-8	(29')*	Feb-88	na	2,980,000	na	na	78,000	**2,450,000**	na	<500	na	250,000
SB-8	(29')	Feb-88	na	71,000	na	na	6,000	15,000	na	<500	na	59,000
SB-8	(34')	Feb-88	na	27,000	na	na	7,000	3,700	na	<500	na	22,000
SB-8	(35')	Feb-88	na	32,000	na	na	5,200	8,400	na	<500	na	17,000
SB-9	(5')*	Feb-88	na	47,000	na	na	10,000	44,000	na	<500	na	40,000
SB-9	(10')*	Feb-88	na	22,000	na	na	7,700	8,000	na	<500	na	28,000
SB-9	(15')*	Feb-88	na	260,000	na	na	36,000	190,000	na	<500	na	350,000
SB-9	(19')*	Feb-88	na	1,430,000	na	na	120,000	**930,000**	na	<500	na	420,000
SB-9	(24')*	Feb-88	na	120,000	na	na	24,000	140,000	na	<500	na	620,000
SB-9	(29')	Feb-88	na	22,000	na	na	6,800	7,300	na	<500	na	21,000
SB-10	(4.5')*	Feb-88	na	130,000	na	na	27,000	95,000	na	<500	na	110,000
SB-10	(9')*	Feb-88	na	83,000	na	na	15,000	67,000	na	<500	na	71,000
SB-10	(15')*	Feb-88	na	320,000	na	na	25,000	380,000	na	<500	na	380,000
SB-10	(20')	Feb-88	na	30,000	na	na	9,300	9,700	na	<500	na	36,000
SB-11	not listed on table	Feb-88	na	45,000	na	na	8,100	6,500	na	<500	na	31,000
SB-11	not listed on table	Feb-88	na	59,000	na	na	12,000	11,000	na	<500	na	41,000
SB-11	not listed on table	Feb-88	na	57,000	na	na	14,000	11,000	na	<500	na	45,000
SB-12	(3.5')	Feb-88	na	66,000	na	na	14,000	11,000	na	<500	na	51,000
SB-12	(10')	Feb-88	na	62,000	na	na	13,000	9,600	na	<500	na	43,000
SB-12	(15')	Feb-88	na	52,000	na	na	11,000	7,700	na	<500	na	37,000
SB-13	(5')*	Feb-88	na	47,000	na	na	9,500	10,000	na	<500	na	34,000
SB-13	(10')	Feb-88	na	4,200	na	na	2,900	15,000	na	<500	na	14,000
SB-13	(15')	Feb-88	na	<500	na	na	2,500	<7,000	na	<500	na	9,200
SB-13	(20')	Feb-88	na	4,200	na	na	3,400	9,200	na	<500	na	17,000
SB-13	(25')	Feb-88	na	40,000	na	na	11,000	7,300	na	<500	na	34,000

TABLE 1-A
Hemphill Road Industrial Land, Burton, Michigan
Soil Analytical Summary - GZA

	MDEQ Criteria	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
2013	Volatilization to Indoor Air Inhalation Criteria	NLV	NLV	NLV	NLV	NLV	NLV	89,000	NLV	NLV	NLV
	Infinite Source Volatile Soil Inhalation Criteria	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
	Finite VSIC for 5 Meter Source Thickness	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
	Finite VSIC for 2 Meter Source Thickness	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
	Particulate Soil Inhalation Criteria	9.10E+05	1.50E+08	2.20E+06	1.50E+08	5.90E+07	4.40E+07	8.80E+06	5.90E+07	2.90E+06	ID
	Nonresidential Direct Contact Criteria	37,000	1.30E+08	2.10E+06	1.0E+9 (D)	7.30E+07	900,000 (DD)	5.80E+05	9.60E+06	9.00E+06	6.30E+08
2017	Infinite Source Volatile Soil Inhalation Criteria	NA	NA	NA	NA	NA	NA	190nc	NA	NA	NA
	Finite VSIC for 2 Meter Source Thickness	NA	NA	NA	NA	NA	NA	3,800nc	NA	NA	NA
	Finite VSIC for 5 Meter Source Thickness	NA	NA	NA	NA	NA	NA	1,500nc	NA	NA	NA
	Particulate Soil Inhalation Criteria	7.0E+05ca	3.8E+08nc	1.7E+06ca	7.7E+06nc	1.5E+08nc	1.2E+07 (L)nc	2.3E+07nc	1.5E+09nc	2.3E+08nc	NA
	Nonresidential Direct Contact Criteria	52,000 ca	1.0E+08 (D)max	2.2E+05nc	1.0E+08 (D)max	2.5E+06nc	760,000 (L,DD)	1.5E+05 (DD)dev	1.2E+07 nc	6.7E+05nc	1.0E+08 (D) max
Sample Location	***Sample Depth***	***Date***									
SB-14	(5')*	Feb-88	na	26,000	na	na	14,000	<7,000	na	<500	na	570,000
SB-14	(10')	Feb-88	na	39,000	na	na	9,100	6,500	na	<500	na	33,000
SB-14	(15')	Feb-88	na	9,900	na	na	4,800	<700	na	<500	na	12,000
SB-14	(25')	Feb-88	na	27,000	na	na	7,500	<700	na	<500	na	24,000
SB-15	(4')*	Feb-88	na	130,000	na	na	32,000	260,000	na	<500	na	210,000
SB-15	(9.5')*	Feb-88	na	7,600	na	na	3,800	13,000	na	<500	na	32,000
SB-15	(15')	Feb-88	na	35,000	na	na	12,000	14,000	na	<500	na	42,000

Notes:

Yellow highlight indicates a concentration above the December 30, 2013 MDEQ nonresidential direct contact criteria.

Blue highlight indicates a concentration above the proposed August 2017 MDEQ nonresidential direct contact criteria.

1) Analytical results and criteria listed in µg/kg (ppb)

2) "--" indicates compound was not detected. Less than "<" the method detection limit shown when available.

3) "*" indicates sample was collected in waste fill material (*i.e.* , debris, refuse, etc. mixed with soil) opposed to fill soil used for leveling or building activities.

4) MDEQ cleanup criteria listed in RRD Operational Memorandum #1, Attachment 1 dated December 30, 2013 and proposed MDEQ cleanup criteria August 2017.

5) D - calculated health-based soil value exceeds 10% by dry weight, hence it is reduced to the maximum ceiling concentration of 10%.

6) DD - hazardous substance causes developmental effects. Residential and Commercial I Direct Contact criteria are protective of both prenatal and postnatal exposure. Industrial and Commercial II, III< and IV Direct Contact criteria are protective for a pregnant adult receptor.

7) L - drinking water, soils protective of drinking water and direct contact for lead are derived using a biologically based model.

8) ID - insufficient data to develop criterion.

9) NA - not available. "na" indicates sample not analyzed.

10) NLV - hazardous substance is not likely to volatilize under most conditions.

11) Samples collected by GZA.

Table 1-A
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results VOCs - GZA

														2013 MDEQ Criteria						2017 MDEQ Criteria				
	MW-1/S-1	MW-1/S-2	MW-1/S-3	MW-1/S-4	S-16/S-1	S-16/S-2	S-16/S-3	S-17/S-2	S-17/S-4	S-17/S-5	S-34/S-3	S-34/S-4	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth Date	*(5')* Oct-87*	*(9.5')* Oct-87*	*(14')* Oct-87*	*(18.5') Oct-87*	*(5')* Oct-87*	*(10') Oct-87*	*(15') Oct-87*	*(10') Sep-87*	*(19.5') Sep-87*	*(24.5') Sep-87*	*(10')* Nov-87*	*(14.5') * Nov-87*											
VOCs																							
Acetone	na	na	na	na	40	57	na	120	na	71	na	na	5.4E+8 (C)	1.60E+08	1.60E+08	2.00E+08	1.70E+11	7.30E+07	1.3E+08st	3.0E+08st	1.6E+08st	1.6E+12st	1.0E+08 (C,D)max
1,2-Dichlorobenzene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	2.0E+7 (C)	4.60E+07	4.60E+07	5.50E+07	4.40E+10	6.3E+7 (C)	1.6E+06nc	4.3E+06nc	2.2E+06nc	2.3E+10nc	1.0E+08 (C,D)max
1,3-Dichlorobenzene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	48,000	94,000	94,000	1.10E+05	8.80E+07	6.6E+5 (C)	14,000nc	42,000nc	21,000nc	2.3E+08nc	1.7E+06 (C)nc
1,4-Dichlorobenzene	<5	20	<50	<5	na	na	na	na	na	na	<2,500	<2,500	1.00E+05	2.60E+05	2.60E+05	3.40E+05	5.70E+08	1.90E+06	48,000ca	1.4E+05ca	70,000ca	7.7E+08ca	2.6E+06ca
Acrolein	<25	<250	<250	<25	na	na	na	na	na	na	<2,500	<2,500	760	370	370	630	5.90E+05	1.20E+07	63nc	270nc	120nc	1.5E+06nc	3.4E+06nc
Acrylonitrile	<25	<250	<250	<25	na	na	na	na	na	na	<2,500	<2,500	35,000	17,000	17,000	31,000	5.80E+07	74,000	2,000ca	7,800ca	3,600ca	4.4E+07ca	61,000ca
2-Butanone	na	na	na	na	na	6	5	10	na	na	na	na	9.9E+7 (C)	3.50E+07	3.50E+07	3.60E+07	2.90E+10	7.0E+8 (C,DD)	1.8E+07 (DD)dev	4.7E+07 (DD)dev	2.4E+07 (DD)dev	2.5E+11 (DD)dev	1.0E+08 (C,D)max
Benzene	<5	19	<50	<5	na	30	na	na	na	na	<2,500	<2,500	8,400	45,000	99,000	2.30E+05	4.70E+08	8.4E+5 (C)	8,200ca	65,000ca	28,000ca	3.8E+08ca	4.3E+05nc
Bromodichloromethane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	6,400	31,000	31,000	57,000	1.10E+08	4.90E+05	3,700nc	26,000nc	11,000nc	1.5E+08nc	5.3E+05 (C)ca
Bromoform	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	7.70E+05	3.10E+06	3.10E+06	3.10E+06	3.60E+09	3.8E+6 (C)	1.6E+05ca	4.9E+05ca	2.4E+05ca	2.7E+09ca	4.2E+06 (C)ca
Bromomethane	<10	<100	<100	<10	na	na	na	na	na	na	<2,500	<2,500	1,600	13,000	57,000	1.40E+05	1.50E+08	1.00E+06	6,800nc	1.3E+05nc	52,000nc	7.7E+08nc	1.7E+07nc
Carbon tetrachloride	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	990	12,000	34,000	79,000	1.70E+08	4.4E+5 (C)	5,200ca	88,000ca	36,000ca	5.4E+08ca	5.1E+05 (C)ca
Chlorobenzene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	2.20E+05	9.20E+05	1.10E+06	2.10E+06	2.10E+09	1.4E+7 (C)	1.5E+05nc	6.7E+05nc	3.0E+05nc	3.8E+09nc	1.7E+07 (C)nc
Chloroethane	<10	<100	<100	<10	na	na	na	na	na	na	<2,500	<2,500	5.3E+6 (C)	3.60E+07	1.20E+08	2.80E+08	2.90E+11	1.2E+7 (C)	2.5E+06nc	5.0E+07nc	2.1E+07nc	3.1E+11nc	1.7E+07ca
2-Chloroethylvinylether	<10	<100	<100	<10	na	na	na	na	na	na	<2,500	<2,500	ID	ID	ID	ID	ID	ID	NA	NA	NA	NA	NA
Chloroform	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	38,000	1.50E+05	3.40E+05	7.90E+05	1.60E+09	5.5E+6 (C)	2,100ca	22,000ca	9,100ca	1.3E+08ca	8.5E+06 (C)nc
Chloromethane	<10	<100	<100	<10	na	na	na	na	na	na	<2,500	<2,500	10,000	1.20E+05	1.00E+06	2.50E+06	2.60E+09	7.4E+6 (C)	52,000nc	1.1E+06nc	4.6E+05nc	6.9E+09nc	1.0E+07ca
Dibromochloromethane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	21,000	80,000	80,000	98,000	1.60E+08	5.00E+05	5,900ca	22,000ca	10,000ca	1.2E+08ca	3.9E+05 (C)ca
1,1-Dichloroethane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	4.30E+05	2.50E+06	6.00E+06	1.40E+07	1.50E+10	8.7E+7 (C)	24,000	3.1E+05	1.3E+05	1.9E+09	5.8E+06 (C)ca
1,2-Dichloroethane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	11,000	21,000	33,000	74,000	1.50E+08	4.20E+05	3,100ca	20,000ca	8,600ca	1.2E+08ca	3.6E+05ca
1,1-Dichloroethene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	330	3,700	15,000	37,000	7.80E+07	6.6E+5 (C)	1.2E+05nc	2.5E+06nc	1.0E+06nc	1.5E+10nc	4.3E+07 (C)nc
trans-1,2-Dichloroethene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	43,000	3.30E+05	8.40E+05	2.00E+06	2.10E+09	1.2E+7 (C)	4.6E+05st	6.5E+06st	2.7E+06st	4.0E+10st	1.7E+07 (C)nc
1,2-Dichloropropane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	7,400	30,000	51,000	1.20E+05	1.20E+08	6.6E+5 (C)	7,000nc	52,000nc	22,000nc	3.1E+08nc	9.2E+05 (C)ca
cis-1,3-Dichloropropene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
trans-1,3-Dichloropropene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Ethylbenzene	<5	1,400	500	<5	na	na	na	na	na	na	<2,500	<2,500	4.6E+5 (C)	2.40E+06	3.10E+06	6.50E+06	1.30E+10	7.1E+7 (C)	41,000ca	2.1E+05ca	92,000ca	1.2E+09ca	3.0E+06 (C)ca
Methylene chloride	<5	180	<50	180	11	49	25	12	17	25	<2,500	<2,500	2.40E+05	7.00E+05	1.70E+06	4.00E+06	8.30E+09	5.8E+6 (C)	6.1E+05nc	7.6E+06nc	3.2E+06nc	4.6E+10nc	5.1E+06 (C)nc
1,1,2,2-Tetrachloroethane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	23,000	34,000	34,000	34,000	6.80E+07	2.40E+05	4,600ca	10,000ca	5,600ca	5.2E+07ca	1.7E+05ca
Tetrachloroethene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	21,000	2.10E+05	4.90E+05	1.10E+06	1.20E+09	9.3E+5 (C)	30,000st	3.4E+05st	1.4E+05st	2.1E+09st	5.1E+06 (C)nc
Toluene	<5	68	<50	<5	5	20	5	na	6	8	<2,500	<2,500	6.1E+5 (C)	3.30E+06	3.60E+07	3.60E+07	1.20E+10	1.6E+8 (C)	9.7E+06st	6.4E+07st	2.8E+07st	3.8E+11st	6.7E+07 (C)nc
1,1,1-Trichloroethane	<5	<50	<50	<5	na	na	na	7	na	na	<2,500	<2,500	4.60E+05	4.50E+06	1.50E+07	3.10E+07	2.90E+10	1.0E+9 (C,D)	3.7E+06st	5.8E+07st	2.4E+07st	3.5E+11st	1.0E+08 (C,D)max
1,1,2-Trichloroethane	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	24,000	57,000	57,000	1.20E+05	2.50E+08	8.40E+05	0.66nc	2.7nc	1.2nc	15,000nc	3.4E+05nc
Trichloroethene	<5	<50	<50	<5	na	na	na	na	na	na	<2,500	<2,500	1,900	14,000	25,000	58,000	5.90E+07	6.6E+5 (C,DD)	1,400 (DD)dev	17,000 (DD)dev	6,900 (DD)dev	1.0E+08 (DD)dev	2.5E+05 (DD)dev
Trichlorofluoromethane	<5	<50	<50	<5	na	na	na	na	na	na	na	na	5.1E+6(C)	1.10E+08	1.40E+11	1.40E+11	1.70E+12	2.6E+8 (C)	2.4E+05nc	5.5E+06nc	2.3E+06nc	3.4E+10nc	1.0E+08 (C,D)max
Vinyl chloride	<10	<100	<100	<10	na	na	na	na	na	na	na	na	2,800	29,000	1.70E+05	4.20E+05	8.90E+08	34,000	4,300ca	110,000ca	45,000ca	6.8E+08ca	46,000ca
Xylenes (Total)	na	na	na	na	na	20	na	na	15	na	na	na	1.2E+7 (C)	5.40E+07	6.50E+07	1.30E+08	1.30E+11	1.0E+9 (C,D)	5.8E+05nc	2.9E+06nc	1.3E+06nc	1.7E+10nc	1.0E+08 (C,D)max
PCBs																							
PCB-1016	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1221	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1232	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1242	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1248	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1254	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1260	--	--	--	--	--	--	--	--	--	--	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
Toxaphene	--	--	--	--	--	--	--	--	--	--	na	na	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

Notes:
1) Analytical results and criteria listed in µg/kg (ppb)
2) "--" indicates compound was not detected. Less than "<" reporting limit shown when available.
3) "*" indicates sample was collected in waste fill material (*i.e.* , debris, refuse, etc. mixed with soil) opposed to fill soil used for leveling or building activities.
4) MDEQ cleanup criteria listed in RRD Operational Memorandum #1, Attachment 1 dated December 30, 2013 and proposed MDEQ cleanup criteria August 2017.
5) C - value presented is a screening level based on the chemical-specific generic soil saturation concentration (Csat) since the calculated risk-based criterion is greater than Csat. Concentrations greater than Csat are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that free-phase material containing a hazardous substance is not present.
6) D - calculated health-based soil value exceeds 10% by dry weight, hence it is reduced to the maximum ceiling concentration of 10%.
7) DD - hazardous substance causes developmental effects. Residential and Commercial I Direct Contact criteria are protective of both prenatal and postnatal exposure. Industrial and Commercial II, III< and IV Direct Contact criteria are protective for a pregnant adult receptor.
8) L - drinking water, soils protective of drinking water and direct contact for lead are derived using a biologically based model.
9) ID - insufficient data to develop criterion.
10) MM - Hazardous substance is a carcinogen with a mutagenic mode of action. The cancer potency values used in calculating health-based values shall be modified using age-dependent adjustment factors for those carcinogenic chemicals identified as mutagenic.
11) NA - not available. "na" indicates sample not analyzed.
12) nc - indicates no criteria.
13) NLV - hazardous substance is not likely to volatilize under most conditions.
14) Q - The soil direct contact criteria for the carcinogenic polynuclear aromatic hydrocarbons (cPAH) are developed using the oral cancer slope factor (SFo) for benzo(a)pyrene.
15) T - refer to the federal Toxic Substances Control Act (TSCA). TSCA Subpart D Cleanup Standard is 1,000 ppb, or 10,000 ppb if capped. Nonresidential Part 201 Soil Direct Contact Cleanup Criteria is 16,000 ppb.
16) Samples collected by GZA.

Table 1-B
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results - MDNR/ERD

										2013 MDEQ Criteria						2017 MDEQ Criteria				
	SS-1	SS-2	SS-3	SS-4	SS-9	SS-2	SS-3	SS-4	SS-5	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth	*(0.5-1')*	*(3-3.5')*	*(1-5')*	*(0-5')*	*(surface/0-1")*															
Date	*Aug-92*	*Aug-92*	*Aug-92*	*Aug-92*	*Aug-92*	*Nov-94*	*Nov-94*	*Nov-94*	*Nov-94*											
Metals																				
Aluminum	5,420,000	8,420,000	4,590,000	8,360,000	54,800,000	8,030,000	8,500,000	3,540,000	6,040,000	NLV	NLV	NLV	NLV	ID	3.7E+8 (DD)	NA	NA	NA	4.2E+08nc	1.0E+08 (D)max
Antimony	8,600 UR	8,900 UR	8,800 UR	9,300 UR	10,700 UR	7,100	--	14,400	--	NLV	NLV	NLV	NLV	5.90E+06	6.70E+05	NA	NA	NA	1.5E+07nc	6.0E+05
Arsenic	4,900	5,600	4,000	6,100	12,800	8,200	5,800	5,900	7,900	NLV	NLV	NLV	NLV	9.10E+05	37,000	NA	NA	NA	7.0E+05 ca	52,000 ca
Barium	41,800 J	53,900	29,100 J	55,200	84,400	589,000	89,400	31,700 B	100,000	NLV	NLV	NLV	NLV	1.50E+08	1.30E+08	NA	NA	NA	3.8E+08nc	1.0E+08 (D)max
Beryllium	960 J	720 J	640 J	870 J	790 J	490 B	460 B	630 B	370 B	NLV	NLV	NLV	NLV	5.90E+05	1.60E+06	NA	NA	NA	1.3E+06ca	2.9E+05nc
Cadmium	670	680 U	670 U	710 U	2,100	--	1,400	--	--	NLV	NLV	NLV	NLV	2.20E+06	2.10E+06	NA	NA	NA	1.7E+06ca	2.2E+05nc
Calcium	62,100,000	29,000,000	18,000,000	40,400,000	41,700,000	34,700,000	35,500,000	27,700,000	30,000,000	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Chromium	11,200	14,400	7,800	14,900	45,500	21,300	14,800	6,700	13,600	NLV	NLV	NLV	NLV	1.50E+08	1.0E+9 (D)	NA	NA	NA	7.7E+06nc	1.0E+08 (D)max
Cobalt	5,200 U	6,000 U	4,900 U	7,200 J	4,700 J	6,900 B	6,100 B	2,400 B	6,500 B	NLV	NLV	NLV	NLV	5.90E+06	9.00E+06	NA	NA	NA	3.3E+05ca	7.4E+05nc
Copper	15,200	9,900	13,000	18,000	53,700	22,700	17,800	3,300 B	24,700	NLV	NLV	NLV	NLV	5.90E+07	7.30E+07	NA	NA	NA	1.5E+08nc	2.5E+06nc
Iron	11,900,000	15,100,000	9,100,000	16,200,000	14,800,000	17,900,000	15,300,000	15,800,000	14,000,000	NLV	NLV	NLV	NLV	ID	5.80E+08	NA	NA	NA	NA	1.0E+08 (D)max
Lead	47,900	14,900	28,000	20,500	912,000	169,000	93,800	8,700	190,000	NLV	NLV	NLV	NLV	4.40E+07	900,000 (DD)	NA	NA	NA	1.2E+07 (L)nc	760,000 (L,DD)
Magnesium	18,000,000	12,800,000	7,850,000	15,500,000	16,700,000	11,600,000	11,100,000	9,220,000	10,600,000	NLV	NLV	NLV	NLV	2.90E+09	1.0E+9 (D)	NA	NA	NA	7.7E+09nc	1.0E+08 (D)max
Manganese	258,000	531,000	175,000	313,000	285,000	283,000	299,000	393,000	320,000	NLV	NLV	NLV	NLV	1.50E+06	9.00E+07	NA	NA	NA	2.3E+07nc	3.2E+07nc
Mercury	110 U	110 U	110 U	110 U	140 U	170	120	--	--	89,000	62,000	62,000	62,000	8.80E+06	5.80E+05	190nc	3,800nc	1,500nc	2.3E+07nc	1.5E+05 (DD)dev
Nickel	11,600	13,000	10,300	16,900	16,100	13,100	15,500	7,100 B	12,600	NLV	NLV	NLV	NLV	1.60E+07	1.50E+08	NA	NA	NA	6.9E+06nc	4.0E+06nc
Potassium	777,000 J	1,030,000 J	576,000 J	1,500,000	748,000 J	1,500,000	1,610,000	597,000 B	1,010,000 B	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Selenium	890 U	910 U	900 U	950 U	1,100 U	270 B	--	--	--	NLV	NLV	NLV	NLV	5.90E+07	9.60E+06	NA	NA	NA	1.5E+09nc	1.2E+07nc
Silver	1,800 U	1,800 U	1,800 U	1,900 U	2,200 U	1,500 B	940 B	--	1,600 B	NLV	NLV	NLV	NLV	2.90E+06	9.00E+06	NA	NA	NA	2.3E+08nc	6.7E+05nc
Sodium	182,000 U	187,000 U	236,000 J	195,000 U	226,000 U	127,000 B	123,000 B	111,000 B	99,000 B	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA	NA	NA	NA	1.0E+08 (D)max
Thallium	1,100 U	1,100 U	1,100 U	1,100 U	1,400 U	--	--	2,100 B	--	NLV	NLV	NLV	NLV	5.90E+06	1.30E+05	NA	NA	NA	1.5E+07nc	25,000nc
Vanadium	14,500	21,900	13,600	22,400	22,000	19,600	20,900	14,700	17,600	NLV	NLV	NLV	NLV	ID	5.5E+6 (DD)	NA	NA	NA	7.7E+06nc	33,000nc
Zinc	42,700	41,900	39,800	48,400	442,000	126,000	110,000	19,000	238,000	NLV	NLV	NLV	NLV	ID	6.30E+08	NA	NA	NA	NA	1.0E+08 (D)max
Cyanide	550 U	570 U	560 U	590 U	590 U	--	--	--	--	NLV	NLV	NLV	NLV	2.50E+05	2.50E+05	1,900nc	11,000nc	4,900nc	6.2E+07nc	8.2E+05nc
VOCs																				
Methylene chloride	--	--	--	12	UJ	na	na	na	na	2.40E+05	7.00E+05	1.70E+06	4.00E+06	8.30E+09	5.8E+6 (C)	6.1E+05nc	7.6E+06nc	3.2E+06nc	4.6E+10nc	5.1E+06 (C)nc
Acetone	20	--	--	--	UJ	na	na	na	na	5.4E+8 (C)	1.60E+08	1.60E+08	2.00E+08	1.70E+11	7.30E+07	1.3E+08st	3.0E+08st	1.6E+08st	1.6E+12st	1.0E+08 (C,D)max
Carbon disulfide	--	--	--	--	UJ	na	na	na	na	1.40E+05	1.60E+06	8.00E+06	1.90E+07	2.10E+10	4.3E+7 (C,DD)	4.0E+05nc	8.8E+06nc	3.6E+06nc	5.4E+10nc	5.5E+07 (C,DD)dev
Tetrachloroethene	--	--	--	--	UJ	na	na	na	na	21,000	2.10E+05	4.90E+05	1.10E+06	1.20E+09	9.3E+5 (C)	30,000st	3.4E+05st	1.4E+05st	2.1E+09st	5.1E+06 (C)nc
Toluene	--	6 J	3 J	9 J	UJ	na	na	na	na	6.1E+5 (C)	3.30E+06	3.60E+07	3.60E+07	1.20E+10	1.6E+8 (C)	9.7E+06st	6.4E+07st	2.8E+07st	3.8E+11st	6.7E+07 (C)nc
Chlorobenzene	--	--	--	9 J	UJ	na	na	na	na	2.20E+05	9.20E+05	1.10E+06	2.10E+06	2.10E+09	1.4E+7 (C)	1.5E+05nc	6.7E+05nc	3.0E+05nc	3.8E+09nc	1.7E+07 (C)nc
Ethylbenzene	--	--	--	--	UJ	na	na	na	na	4.6E+5 (C)	2.40E+06	3.10E+06	6.50E+06	1.30E+10	7.1E+7 (C)	41,000ca	2.1E+05ca	92,000ca	1.2E+09ca	3.0E+06 (C)ca
Xylene (total)	--	20	--	14	UJ	na	na	na	na	1.2E+7 (C)	5.40E+07	6.50E+07	1.30E+08	1.30E+11	1.0E+9 (C,D)	5.8E+05nc	2.9E+06nc	1.3E+06nc	1.7E+10nc	1.0E+08 (C,D)max

Table 1-B
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results - MDNR/ERD

										2013 MDEQ Criteria						2017 MDEQ Criteria				
	SS-1	SS-2	SS-3	SS-4	SS-9	SS-2	SS-3	SS-4	SS-5	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth	*(0.5-1')*	*(3-3.5')*	*(1-5')*	*(0-5')*	*(surface/0-1")*															
Date	*Aug-92*	*Aug-92*	*Aug-92*	*Aug-92*	*Aug-92*	*Nov-94*	*Nov-94*	*Nov-94*	*Nov-94*											
SVOCs																				
1,3-Dichlorobenzene	--	--	--	--	--	na	na	na	na	48,000	94,000	94,000	1.10E+05	8.80E+07	6.6E+5 (C)	14,000nc	42,000nc	21,000nc	2.3E+08nc	1.7E+06 (C)nc
1,4-Dichlorobenzene	--	--	--	--	--	na	na	na	na	1.00E+05	2.60E+05	2.60E+05	3.40E+05	5.70E+08	1.90E+06	48,000ca	1.4E+05ca	70,000ca	7.7E+08ca	2.6E+06ca
4-Methylphenol	--	--	--	--	--	na	na	na	na	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2,4-Dimethylphenol	--	--	--	--	--	na	na	na	na	NLV	NLV	NLV	NLV	2.10E+09	3.60E+07	NA	NA	NA	5.4E+09nc	1.7E+07nc
Naphthalene	--	--	--	--	--	na	na	na	na	4.70E+05	3.50E+05	3.50E+05	3.50E+05	8.80E+07	5.20E+07	24,000ca	27,000ca	24,000ca	8.8E+07ca	8.5E+07nc
2-Methylnaphthalene	--	--	--	--	--	na	na	na	na	4.90E+06	1.80E+06	1.80E+06	1.80E+06	2.90E+08	2.60E+07	2.7E+05nc	2.8E+05nc	2.7E+05nc	7.7E+08nc	3.4E+06nc
Dimethy phthalate	--	--	--	--	--	na	na	na	na	NLV	NLV	NLV	NLV	1.50E+09	1.0E+9 (C,D)	NA	NA	NA	3.8E+09nc	8.5E+07 (C)nc
Acenaphthylene	--	--	--	52 J	6,200	na	na	na	na	3.00E+06	2.70E+06	2.70E+06	2.70E+06	1.00E+09	5.20E+06	1.8E+07nc	1.8E+07nc	1.8E+07nc	1.6E+10nc	5.1E+07nc
Acenaphthene	160 J	--	--	130 J	580 J	na	na	na	na	3.50E+08	9.70E+07	9.70E+07	9.70E+07	6.20E+09	1.30E+08	1.4E+07nc	1.4E+07nc	1.4E+07nc	1.6E+10nc	5.1E+07nc
Dibenzofuran	73 J	--	--	71 J	540 J	27 J	--	--	--	3.60E+06	1.60E+05	1.60E+05	1.60E+05	2.90E+06	ID	4.1E+05nc	4.1E+05nc	4.1E+05nc	3.1E+08nc	8.5E+05nc
Diethylphthalate	--	--	--	--	--	na	na	na	na	NLV	NLV	NLV	NLV	1.50E+09	1.0E+9 (C,D)	NA	NA	NA	2.2E+11nc	1.0E+08 (C,D)max
Fluorene	130 J	--	--	98 J	1,300 J	na	na	na	na	1.0E+9 (D)	1.50E+08	1.50E+08	1.50E+08	4.10E+09	8.70E+07	1.5E+07nc	1.5E+07nc	1.5E+07nc	1.1E+10nc	3.4E+07nc
Phenanthrene	1,400	76 J	--	1,000	23,000	na	na	na	na	5.10E+06	1.90E+05	1.90E+05	1.90E+05	2.90E+06	5.20E+06	28,000nc	29,000nc	29,000nc	7.7E+06nc	2.6E+07nc
Anthracene	270 J	--	--	170 J	3,400 J	na	na	na	na	1.0E+9 (D)	1.60E+09	1.60E+09	1.60E+09	2.90E+10	7.30E+08	2.4E+08nc	2.4E+08nc	2.4E+08nc	7.7E+10nc	1.0E+08 (D)max
Carbazole	240 J	--	--	160 J	5,400	76 J	23 J	--	--	NLV	NLV	NLV	NLV	7.80E+07	2.40E+06	NA	NA	NA	1.1E+09ca	3.4E+05ca
Di-n-butylphthalate	--	--	--	--	--	na	na	na	na	NLV	NLV	NLV	NLV	1.50E+09	8.7E+7 (C)	NA	NA	NA	1.0E+09 (DD)dev	3.3E+06 (C,DD)dev
Fluoranthene	2,100	140 J	--	1,400	61,000	na	na	na	na	1.0E+9 (D)	8.90E+08	8.80E+08	8.80E+08	4.10E+09	1.30E+08	NA	NA	NA	1.1E+10nc	4.9E+07nc
Pyrene	1,600	89 J	--	1,100 J	36,000	na	na	na	na	1.0E+9 (D)	7.80E+08	7.80E+08	7.80E+08	2.90E+09	8.40E+07	1.1E+08nc	1.2E+08nc	1.2E+08nc	7.7E+09nc	3.7E+07nc
Butyl benzyl phthalate	130 J	--	--	UJ	2,400 J	na	na	na	na	NLV	NLV	NLV	NLV	2.10E+10	1.2E+8 (C)	NA	NA	NA	6.0E+10nc	9.9E+06 (DD)dev
Benzo(a)anthracene	880	--	--	560 J	22,000	410	190 J	19 J	170 J	NLV	NLV	NLV	NLV	ID	80,000	1.3E+06ca	1.4E+06ca	1.4E+06ca	5.0E+07ca	(Q)
Chrysene	960	--	--	710 J	32,000	430	200 J	35 J	200 J	ID	ID	ID	ID	ID	8.00E+06	NA	NA	NA	5.0E+09ca	(Q)
bis(2-ethylhexyl)phthalate	180 J	--	100 J	UJ	1,300 J	na	na	na	na	NLV	NLV	NLV	NLV	8.90E+08	1.2E+7 (C)	NA	NA	NA	1.9E+09ca	3.4E+06 (C)ca
Di-n-octylphthalate	--	79 J	81 J	--	--	na	na	na	na	NLV	NLV	NLV	NLV	1.40E+10	2.00E+07	4.5E+08nc	4.7E+08nc	4.7E+08nc	3.6E+10nc	1.5E+07nc
Benzo(b)fluoranthene	770	--	--	--	25,000	1,500	440	--	560	ID	ID	ID	ID	ID	80,000	NA	NA	NA	5.0E+07ca	(Q)
Benzo(k)fluoranthene	880	--	--	490	22,000	--	--	--	--	NLV	NLV	NLV	NLV	ID	8.00E+05	NA	NA	NA	5.0E+08ca	(Q)
Benzo(a)pyrene	870	--	--	560	**26,000**	540	190 J	--	280 J	NLV	NLV	NLV	NLV	1.90E+06	8,000	NA	NA	NA	1.0E+05 (DD)dev	41,000ca
Indeno(1,2,3-cd)pyrene	540	--	--	UJ	28,000	220 J	64 J	--	--	NLV	NLV	NLV	NLV	ID	80,000	NA	NA	NA	5.0E+07ca	(Q)
Dibenzo(ah)anthracene	--	--	--	UJ	UJ	--	--	--	--	NLV	NLV	NLV	NLV	ID	8,000	NA	NA	NA	5.0E+06ca	(Q)
Benzo(ghi)perylene	500	--	--	UJ	27,000	na	na	na	na	NLV	NLV	NLV	NLV	3.50E+08	7.00E+06	NA	NA	NA	5.4E+08nc	2.1E+06nc
Pesticides / PCBs																				
Heptachlor	2 U	--	2 U	--	UJ	na	na	na	na	1.90E+06	2.10E+05	2.10E+05	2.10E+05	3.00E+06	23,000	38,000ca	40,000ca	40,000ca	2.3E+06ca	40,000ca
Heptachlor epoxide	--	--	--	--	4 J	na	na	na	na	NLV	NLV	NLV	NLV	1.50E+06	9,500	4,800ca	4,900ca	4,900ca	1.2E+06ca	13,000ca
Dieldrin	--	--	--	--	UJ	na	na	na	na	7.20E+05	64,000	64,000	64,000	8.50E+05	4,700	6,900ca	7,100ca	7,100ca	6.5E+05ca	3,000ca
4,4'-DDE	--	--	--	--	UJ	na	na	na	na	NLV	NLV	NLV	NLV	4.00E+07	1.90E+05	2.9E+05ca	3.0E+05ca	3.0E+05ca	3.1E+07ca	1.4E+05ca
Endosulfan	--	--	--	--	14 J	na	na	na	na	ID	ID	ID	ID	ID	4.40E+06	NA	NA	NA	NA	4.3E+06nc
4,4'-DDD	--	--	--	--	UJ	na	na	na	na	NLV	NLV	NLV	NLV	5.60E+07	4.00E+05	NA	NA	NA	4.3E+07ca	2.0E+05ca
4,4'-DDT	6.2 J	--	7.2 J	--	UJ	na	na	na	na	NLV	NLV	NLV	NLV	4.00E+07	2.80E+05	NA	NA	NA	3.1E+07ca	2.3E+05ca
Endrin aldehyde	--	--	--	--	UJ	na	na	na	na	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
alpha-Chlordane	--	--	--	--	UJ	na	na	na	na	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
gamma-Chlordane	--	--	--	--	UJ	na	na	na	na	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
PCBs-1016	--	--	--	--	UJ	na	na	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)ca
PCBs-1254	--	--	--	--	UJ	na	na	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)ca
PCBs-1260	--	--	160	--	UJ	na	na	na	na	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)ca

Notes:

Yellow highlight indicates a cc Yellow highlight indicates a concentration above the December 30, 2013 MDEQ nonresidential direct contact criteria.

1) Analytical results and criteria listed in µg/kg (ppb)
2) "--" indicates compound was not detected. Less than "<" reporting limit shown when available.
3) "*" indicates sample was collected in waste fill material (*i.e.* , debris, refuse, etc. mixed with soil) opposed to fill soil used for leveling or building activities.
4) MDEQ cleanup criteria listed in RRD Operational Memorandum #1, Attachment 1 dated December 30, 2013 and proposed MDEQ cleanup criteria August 2017.
5) C - value presented is a screening level based on the chemical-specific generic soil saturation concentration (Csat) since the calculated risk-based criterion is greater than Csat. Concentrations greater than Csat are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that free-phase material containing a hazardous substance is not present.
6) D - calculated health-based soil value exceeds 10% by dry weight, hence it is reduced to the maximum ceiling concentration of 10%.
7) ID - insufficient data to develop criterion.
8) J - estimated laboratory value.
9) NA - not available. "na" indicates sample not analyzed.
10) nc - indicates no criteria.
11) NLV - hazardous substance is not likely to volatilize under most conditions.
12) Q - The soil direct contact criteria for the carcinogenic polynuclear aromatic hydrocarbons (cPAH) are developed using the oral cancer slope factor (SFo) for benzo(a)pyrene.
13) T - refer to the federal Toxic Substances Control Act (TSCA). TSCA Subpart D Cleanup Standard is 1,000 ppb, or 10,000 ppb if capped. Nonresidential Part 201 Soil Direct Contact Cleanup Criteria is 16,000 ppb.
14) Samples collected by MDNR/ERD.

TABLE 1-C
Hemphill Road Industrial Land, Burton, Michigan
Soil Analytical Summary - OBG

	MDEQ Criteria		Metals	VOCs			
			Lead	Benzene	Ethylbenzene	Xylenes (Total)	Toluene
2013	Volatilization to Indoor Air Inhalation Criteria		NLV	8,400	4.6E+5 (C)	1.2E+7 (C)	6.1E+5 (C)
	Infinite Source Volatile Soil Inhalation Criteria		NLV	45,000	2.40E+06	5.40E+07	3.30E+06
	Finite VSIC for 5 Meter Source Thickness		NLV	99,000	3.10E+06	6.50E+07	3.60E+07
	Finite VSIC for 2 Meter Source Thickness		NLV	2.30E+05	6.50E+06	1.30E+08	3.60E+07
	Particulate Soil Inhalation Criteria		4.40E+07	4.70E+08	1.30E+10	1.30E+11	1.20E+10
	Nonresidential Direct Contact Criteria		900,000 (DD)	8.4E+5 (C)	7.1E+7 (C)	1.0E+9 (C,D)	1.6E+8 (C)
2017	Infinite Source Volatile Soil Inhalation Criteria		NA	8,200ca	41,000ca	5.8E+05nc	9.7E+06st
	Finite VSIC for 2 Meter Source Thickness		NA	65,000ca	2.1E+05ca	2.9E+06nc	6.4E+07st
	Finite VSIC for 5 Meter Source Thickness		NA	28,000ca	92,000ca	1.3E+06nc	2.8E+07st
	Particulate Soil Inhalation Criteria		1.2E+07 (L)nc	3.8E+08ca	1.2E+09ca	1.7E+10nc	3.8E+11st
	Nonresidential Direct Contact Criteria		760,000 (L,DD)	4.3E+05 nc	3.0E+06 (C) ca	1.0E+08 (C,D) max	6.7E+07 (C) nc
Sample Location	*Sample Depth*	*Date*					
OBG SB-1	(10-12')*	Aug-97	78,000	<400	<400	<1200	<400
OBG SB-2	(6-8')*	Aug-97	1,100,000	<310	1,900	<920	<310
OBG SB-3	(6-8')*	Aug-97	100,000	<290	<290	<860	<290
OBG SB-4	(2-4')*	Aug-97	3,900,000	<280	<280	<840	<280
OBG SB-5	(6-8')	Aug-97	6,000	<1	<1	<3	<1
OBG SB-6	(8-10')	Aug-97	17,000	<320	550	3,400	<320
OBG SB-7	(8-10')*	Aug-97	1,100,000	<310	1,700	2,300	<310
OBG SB-8	(4-6')*	Aug-97	810,000	<280	370	2,100	<280
OBG SB-9	(4-6')*	Aug-97	20,000	<7	<7	<22	<7
OBG SB-10	(6-8')	Aug-97	5,000	<1	<1	<3	<1
OBG SB-11	(6-8')	Aug-97	2,000	<1	<1	<4	<1
OBG SB-12	(8-10')	Aug-97	3,000	<1	<1	<4	<1
OBG SB-13	(6-8')	Aug-97	1,000	<1	<1	<4	<1
OBG SB-14	(2-4')*	Aug-97	9,000	<1	<1	<3	<1
OBG SB-15	(4-6')*	Aug-97	4,000	<270	<270	<810	<270
OBG SB-16	(0-2')*	Aug-97	290,000	<290	<290	<860	<290
OBG SB-17	(4-6')	Aug-97	4,000	<290	<290	<870	<290
OBG SB-18	(6-8')	Aug-97	3,000	<1	<1	<3	<1
OBG SB-19	(2-4')	Aug-97	1,000	<1	<1	<3	<1
OBG SB-20	(4-6')	Aug-97	4,000	<1	<1	<3	<1
OBG SB-21	(6-8')	Aug-97	6,000	<300	<300	<900	<300
OBG SB-22	(2-4')*	Aug-97	3,000	<1	<1	<3	<1
OBG SB-23	(4-6')*	Aug-97	110,000	<3,100	49,000	35,000	<3,100
OBG SB-24	(6-8')	Aug-97	4,000	<1	<1	<3	<1
OBG SB-25	(4-6')	Aug-97	8,000	<1	<1	<4	<1
OBG SB-26	(6-8')	Aug-97	3,000	<1	<1	<3	<1
OBG SB-27	(2-4')	Aug-97	6,000	<1	<1	<3	<1
OBG SB-28	(10-12')	Dec-99	5,100	400	1,250	3,240	330
OBG SB-29	(8-10')	Dec-99	8,100	120	240	290	70
OBG SB-30	(12-14')	Dec-99	5,600	<50	<50	<50	<50
OBG SB-31	(2-4')	Dec-99	6,800	<50	<50	<50	<50
OBG SB-32	(14-16')	Dec-99	4,600	<50	<50	<50	160
OBG SB-33	(10-12')	Dec-99	7,400	540	60	<50	<50
OBG SB-34	(4-6')	Dec-99	3,600	<50	<50	<50	100
OBG SB-35	(8-10')	Dec-99	7,200	<50	<50	<50	<50
OBG SB-36	(10-12')	Dec-99	6,500	<50	<50	<50	<50
OBG SB-37	(8-10')	Dec-99	4,400	<50	<50	<50	<50
OBG SB-38	(12-14')	Dec-99	2,100	<50	<50	<50	<50
OBG SB-39	(8-10')	Dec-99	4,400	<50	<50	<50	<50
OBG SB-40	(10-12')	Dec-99	5,900	<50	<50	<50	<50
OBG SB-41	(8-10')	Dec-99	5,300	<50	<50	<50	<50
OBG SB-42	(8-10')	Dec-99	6,400	<50	<50	<50	<50
OBG SB-43	(6-8')	Dec-99	9,200	<50	<50	<50	<50
LASB-1	(2-4')*	Jun-16	146,000	na	na	na	na
LASB-1	(6-8')	Jun-16	45,400	na	na	na	na
LASB-2	(2-4')*	Jun-16	57,700	na	na	na	na
LASB-2	(12-14')*	Jun-16	185,000	na	na	na	na
LASB-3	(8-10')*	Jun-16	28,100	na	na	na	na
LASB-3	(12-14')	Jun-16	5,410	na	na	na	na
LASB-4	(8-10')*	Jun-16	10,100	na	na	na	na
LASB-4	(16-18')	Jun-16	4,040	na	na	na	na

Notes:

Yellow highlight indicates a concentration above the December 30, 2013 MDEQ nonresidential direct contact criteria.
Blue highlight indicates a concentration above the proposed August 2017 MDEQ nonresidential direct contact criteria.
Green highlight indicates a concentration above the proposed August 2017 MDEQ nonresidential VSIC criteria.

1) Analytical results and criteria listed in µg/kg (ppb)
2) "--" indicates compound was not detected. Less than "<" the method detection limit shown when available.
3) "*" indicates sample was collected in waste fill material (*i.e.* , debris, refuse, etc. mixed with soil) opposed to fill soil used for leveling or building activities.
4) MDEQ cleanup criteria listed in RRD Operational Memorandum #1, Attachment 1 dated December 30, 2013 and proposed MDEQ cleanup criteria August 2017.
5) C - value presented is a screening level based on the chemical-specific generic soil saturation concentration (Csat) since the calculated risk-based criterion is greater than Csat. Concentrations greater than Csat are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that free-phase material containing a hazardous substance is not present.
6) D - calculated health-based soil value exceeds 10% by dry weight, hence it is reduced to the maximum ceiling concentration of 10%.
7) DD - hazardous substance causes developmental effects. Residential and Commercial I Direct Contact criteria are protective of both prenatal and postnatal exposure. Industrial and Commercial II, III< and IV Direct Contact criteria are protective for a pregnant adult receptor.
8) L - drinking water, soils protective of drinking water and direct contact for lead are derived using a biologically based model.
9) NA - not available. "na" indicates sample not analyzed.
10) NLV - hazardous substance is not likely to volatilize under most conditions.
11) Samples collected by O'Brien & Gere Engineers.

Table 1-D
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results - Insight

									2013 MDEQ Criteria						2017 MDEQ Criteria				
	HP-1-99	HP-2-99	HP-7-99	HP-8-99	HP-8-99	HP-9-99	HP-9-99	HP-10-99	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth	*(14-16')*	*(0-2')*	*(2-4')*	*(8-10')*	*(12-14')*	*(4-6')*	*(8-10')*	*(8-10')*											
Date	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*											
Metals																			
Arsenic	4,600	1,300	1,500	1,900	na	5,100	na	6,500	NLV	NLV	NLV	NLV	9.10E+05	37,000	NA	NA	NA	7.0E+05ca	52,000 ca
Barium	33,000	8,200	4,600	11,000	na	42,000	na	49,000	NLV	NLV	NLV	NLV	1.50E+08	1.30E+08	NA	NA	NA	3.8E+08	1.0E+08 (D)max
Cadmium	67	62	<50	59	na	91	na	110	NLV	NLV	NLV	NLV	2.20E+06	2.10E+06	NA	NA	NA	1.7E+06ca	2.2E+05nc
Chromium	9,200	2,000	2,200	3,500	na	11,000	na	11,000	NLV	NLV	NLV	NLV	1.50E+08	1.0E+9 (D)	NA	NA	NA	7.7E+06nc	1.0E+08 (D)max
Copper	7,800	5,500	3,300	3,700	na	12,000	na	14,000	NLV	NLV	NLV	NLV	5.90E+07	7.30E+07	NA	NA	NA	1.5E+08nc	2.5E+06nc
Lead	5,600	4,200	2,000	2,300	na	7,000	na	8,400	NLV	NLV	NLV	NLV	4.40E+07	900,000 (DD)	NA	NA	NA	1.2E+07 (L)nc	760,000 (L,DD)
Manganese	220,000	170,000	62,000	100,000	na	310,000	na	330,000	NLV	NLV	NLV	NLV	1.50E+06	9.00E+07	NA	NA	NA	2.3E+07nc	3.2E+07nc
Mercury	<100	<100	<100	<100	na	<100	na	<100	89,000	62,000	62,000	62,000	8.80E+06	5.80E+05	190nc	3,800nc	1,500nc	2.3E+07nc	1.5E+05 (DD)dev
Selenium	<230	<210	<240	<240	na	<230	na	<250	NLV	NLV	NLV	NLV	5.90E+07	9.60E+06	NA	NA	NA	1.5E+09nc	1.2E+07nc
Silver	<500	<500	<500	<500	na	<500	na	<500	NLV	NLV	NLV	NLV	2.90E+06	9.00E+06	NA	NA	NA	2.3E+08nc	6.7E+05nc
Strontium	47,000	33,000	17,000	18,000	na	26,000	na	31,000	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA	NA	NA	NA	1.0E+08 (D)max
Zinc	22,000	24,000	11,000	9,900	na	33,000	na	40,000	NLV	NLV	NLV	NLV	ID	6.30E+08	NA	NA	NA	NA	1.0E+08 (D)max

Table 1-D
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results - Insight

									2013 MDEQ Criteria						2017 MDEQ Criteria				
	HP-1-99	HP-2-99	HP-7-99	HP-8-99	HP-8-99	HP-9-99	HP-9-99	HP-10-99	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth	*(14-16')*	*(0-2')*	*(2-4')*	*(8-10')*	*(12-14')*	*(4-6')*	*(8-10')*	*(8-10')*											
Date	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*											
VOCs																			
Acetone	<750	<750	<750	<750	<750	<750	<750	<750	5.4E+8 (C)	1.60E+08	1.60E+08	2.00E+08	1.70E+11	7.30E+07	1.3E+08st	3.0E+08st	1.6E+08st	1.6E+12st	1.0E+08 (C,D)max
Acrylonitrile	<280	<260	<300	<290	<250	<280	<250	<310	35,000	17,000	17,000	31,000	5.80E+07	74,000	2,000ca	7,800ca	3,600ca	4.4E+07ca	61,000ca
Benzene	<55	<52	<60	170	<50	<56	<50	<61	8,400	45,000	99,000	2.30E+05	4.70E+08	8.4E+5 (C)	8,200ca	65,000ca	28,000ca	3.8E+08ca	4.3E+05nc
Bromochloromethane	<100	<100	<100	<100	<100	<100	<100	<100	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Bromodichloromethane	<100	<100	<100	<100	<100	<100	<100	<100	6,400	31,000	31,000	57,000	1.10E+08	4.90E+05	3,700nc	26,000nc	11,000nc	1.5E+08nc	5.3E+05 (C)ca
Bromoform	<100	<100	<100	<100	<100	<100	<100	<100	7.70E+05	3.10E+06	3.10E+06	3.10E+06	3.60E+09	3.8E+6 (C)	1.6E+05ca	4.9E+05ca	2.4E+05ca	2.7E+09ca	4.2E+06 (C)ca
Bromomethane	<250	<250	<250	<250	<250	<250	<250	<250	1,600	13,000	57,000	1.40E+05	1.50E+08	1.00E+06	6,800nc	1.3E+05nc	52,000nc	7.7E+08nc	1.7E+07nc
2-Butanone (MEK)	<280	<260	<300	<290	<250	<280	<250	<310	9.9E+7 (C)	3.50E+07	3.50E+07	3.60E+07	2.90E+10	7.0E+8 (C,DD)	1.8E+07 (DD)dev	4.7E+07 (DD)dev	2.4E+07 (DD)dev	2.5E+11 (DD)dev	1.0E+08 (C,D)max
Carbon disulfide	<250	<250	<250	<250	<250	<250	<250	<250	1.40E+05	1.60E+06	8.00E+06	1.90E+07	2.10E+10	4.3E+7 (C,DD)	4.0E+05nc	8.8E+06nc	3.6E+06nc	5.4E+10nc	5.5E+07 (C,DD)dev
Carbon tetrachloride	<55	<52	<60	<56	<50	<56	<50	<61	990	12,000	34,000	79,000	1.70E+08	4.4E+5 (C)	5,200ca	88,000ca	36,000ca	5.4E+08ca	5.1E+05 (C)ca
Chlorobenzene	<55	<52	<60	<56	<50	<56	<50	<61	2.20E+05	9.20E+05	1.10E+06	2.10E+06	2.10E+09	1.4E+7 (C)	1.5E+05nc	6.7E+05nc	3.0E+05nc	3.8E+09nc	1.7E+07 (C)nc
Chloroethane	<280	<260	<300	<290	<250	<280	<250	<310	5.3E+6 (C)	3.60E+07	1.20E+08	2.80E+08	2.90E+11	1.2E+7 (C)	2.5E+06nc	5.0E+07nc	2.1E+07nc	3.1E+11nc	1.7E+07ca
Chloroform	<55	<52	<60	<56	<50	<56	<50	<61	38,000	1.50E+05	3.40E+05	7.90E+05	1.60E+09	5.5E+6 (C)	2,100ca	22,000ca	9,100ca	1.3E+08ca	8.5E+06 (C)nc
Chloromethane	<280	<260	<300	<290	<250	<280	<250	<310	10,000	1.20E+05	1.00E+06	2.50E+06	2.60E+09	7.4E+6 (C)	52,000nc	1.1E+06nc	4.6E+05nc	6.9E+09nc	1.0E+07ca
1,2-Dibromo-3-Chloropropane	<280	<260	<300	<290	<250	<280	<250	<310	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Dibromochloromethane	<100	<100	<100	<100	<100	<100	<100	<100	21,000	80,000	80,000	98,000	1.60E+08	5.00E+05	5,900ca	22,000ca	10,000ca	1.2E+08ca	3.9E+05 (C)ca
1,2-Dibromoethane	<55	<52	<60	<100	<100	<100	<100	<100	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Dibromomethane	<100	<100	<100	<100	<100	<100	<100	<100	ID	ID	ID	ID	ID	8.0E+6 (C)	10,000nc	53,000nc	24,000nc	3.1E+08nc	2.6E+06 (C)nc
trans-1,4-Dichloro-2-butene	<100	<100	<100	<56	<50	<56	<50	<61	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
1,4-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	1.00E+05	2.60E+05	2.60E+05	3.40E+05	5.70E+08	1.90E+06	48,000ca	1.4E+05ca	70,000ca	7.7E+08ca	2.6E+06ca
1,2-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	2.0E+7 (C)	4.60E+07	4.60E+07	5.50E+07	4.40E+10	6.3E+7 (C)	1.6E+06nc	4.3E+06nc	2.2E+06nc	2.3E+10nc	1.0E+08 (C,D)max
1,3-Dichlorobenzene	<100	<100	<300	<100	<100	<100	<100	<100	48,000	94,000	94,000	1.10E+05	8.80E+07	6.6E+5 (C)	14,000nc	42,000nc	21,000nc	2.3E+08nc	1.7E+06 (C)nc
Dichlorodifluoromethane	<280	<260	<60	<290	<250	<280	<250	<310	1.70E+06	6.30E+07	5.50E+08	1.40E+09	1.50E+12	1.7E+8 (C)	1.6E+05nc	4.1E+06nc	1.7E+06nc	2.5E+10nc	4.3E+06nc
1,1-Dichloroethane	<55	<52	<60	<56	<50	<56	<50	<61	4.30E+05	2.50E+06	6.00E+06	1.40E+07	1.50E+10	8.7E+7 (C)	24,000	3.1E+05	1.3E+05	1.9E+09	5.8E+06 (C)ca
1,2-Dichloroethane	<55	<52	<60	<56	<50	<56	<50	<61	11,000	21,000	33,000	74,000	1.50E+08	4.20E+05	3,100ca	20,000ca	8,600ca	1.2E+08ca	3.6E+05ca
trans-1,2-Dichloroethene	<55	<52	<60	<56	<50	<56	<50	<61	43,000	3.30E+05	8.40E+05	2.00E+06	2.10E+09	1.2E+7 (C)	4.6E+05st	6.5E+06st	2.7E+06st	4.0E+10st	1.7E+07 (C)nc
cis-1,2-Dichloroethene	<55	<52	<60	<56	<50	<56	<50	<61	41,000	2.10E+05	4.30E+05	1.00E+06	1.00E+09	8.0E+6 (C)	9,300nc	1.0E+05nc	43,000nc	6.2E+08nc	1.7E+06 (C)nc
1,1-Dichloroethene	<55	<52	<60	<56	<50	<56	<50	<61	330	3,700	15,000	37,000	7.80E+07	6.6E+5 (C)	1.2E+05nc	2.5E+06nc	1.0E+06nc	1.5E+10nc	4.3E+07 (C)nc
1,2-Dichloropropane	<55	<52	<60	<56	<50	<56	<50	<61	7,400	30,000	51,000	1.20E+05	1.20E+08	6.6E+5 (C)	7,000nc	52,000nc	22,000nc	3.1E+08nc	9.2E+05 (C)ca
trans-1,3-Dichloropropene	<55	<52	<60	<56	<50	<56	<50	<61	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
cis-1,3-Dichloropropene	<55	<52	<60	<56	<50	<56	<50	<61	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Diethyl ether	<280	<260	<300	<290	<250	<280	<250	<310	5.2E+7 (C)	1.00E+08	1.60E+08	3.50E+08	3.50E+11	3.6E+8 (C)	1.4E+06nc	1.3E+07nc	5.5E+06nc	7.7E+10nc	1.0E+08 (C,D)max
Ethylbenzene	<55	<52	<60	<56	<50	<56	<50	<61	4.6E+5 (C)	2.40E+06	3.10E+06	6.50E+06	1.30E+10	7.1E+7 (C)	41,000ca	2.1E+05ca	92,000ca	1.2E+09ca	3.0E+06 (C)ca
Hexachloroethane	<100	<100	<100	<100	<100	<100	<100	<100	79,000	6.60E+05	1.40E+06	1.40E+06	1.00E+08	7.30E+05	14,000ca	53,000ca	25,000ca	3.0E+08ca	6.0E+05nc
2-Hexanone	<280	<260	<300	<290	<250	<280	<250	<310	1.80E+06	1.30E+06	1.30E+06	1.50E+06	1.20E+09	1.0E+8 (C)	1.8E+05	4.4E+05	2.3E+05	2.3E+09	4.3E+06 (C)
Isopropylbenzene	<100	<100	<100	<100	<100	<100	<100	<100	7.3E+5 (C)	2.00E+06	2.00E+06	3.00E+06	2.60E+09	8.0E+7 (C)	11,000ca	50,000ca	22,000ca	2.9E+08ca	8.5E+07 (C)nc
Methyl iodide	<55	<52	<60	<100	<50	<100	<50	<100	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Meth(tert)butyl ether(MTBE)	<280	<260	<300	<290	<250	<280	<250	<310	1.8E+7 (C)	3.00E+07	4.10E+07	8.90E+07	8.80E+10	7.1E+6 (C)	3.4E+05ca	2.0E+06ca	8.7E+05ca	1.2E+10ca	9.8E+06 (C)ca
4-Methyl-2pentanone (MIBK)	<280	<260	<300	<290	<250	<280	<250	<310	6.9E+7 (C)	5.30E+07	5.30E+07	7.00E+07	6.00E+10	1.8E+8 (C)	9.4E+06 (DD)dev	2.8E+07 (DD)dev	1.4E+07 (DD)dev	1.5E+11 (DD)dev	4.3E+07 (C)nc
Methylene chloride	<280	<260	<300	<290	<250	<280	<250	<310	2.40E+05	7.00E+05	1.70E+06	4.00E+06	8.30E+09	5.8E+6 (C)	6.1E+05nc	7.6E+06nc	3.2E+06nc	4.6E+10nc	5.1E+06 (C)nc
2-Methylnaphthalene	<2,800	<2,600	<3,000	<2,900	<2,500	<2,800	<2,500	<3,100	4.90E+06	1.80E+06	1.80E+06	1.80E+06	2.90E+08	2.60E+07	2.7E+05nc	2.8E+05nc	2.7E+05nc	7.7E+08nc	3.4E+06nc
Naphthalene	<280	<260	<300	<290	<250	<280	<250	<310	4.70E+05	3.50E+05	3.50E+05	3.50E+05	8.80E+07	5.20E+07	24,000ca	27,000ca	24,000ca	8.8E+07ca	8.5E+07nc
n-Propylbenzene	<100	<100	<100	<100	<100	<100	<100	<100	ID	ID	ID	ID	5.90E+08	8.00E+06	2.1E+06 (DD)dev	8.8E+06 (DD)dev	4.0E+06 (DD)dev	5.0E+10 (DD)dev	8.5E+07 (C)nc
Styrene	<55	<52	<60	<56	<50	<56	<50	<61	1.3E+6 (C)	3.30E+06	3.30E+06	4.20E+06	6.90E+09	1.9E+6 (C)	2.9E+05ca	9.5E+05ca	4.6E+05ca	5.3E+09ca	2.6E+06 (C)ca
1,1,2,2-Tetrachloroethane	<100	<100	<100	<100	<100	<100	<100	<100	23,000	34,000	34,000	34,000	6.80E+07	2.40E+05	4,600ca	10,000ca	5,600ca	5.2E+07ca	1.7E+05ca
1,1,1,2-Tetrachloroethane	<100	<100	<100	<100	<100	<100	<100	<100	33,000	1.20E+05	2.10E+05	3.30E+05	5.30E+08	2.2E+6 (C)	14,000ca	70,000ca	31,000ca	4.1E+08ca	1.3E+06 (C)ca
Tetrachloroethene	<55	<52	<60	<58	<50	<56	<50	<61	21,000	2.10E+05	4.90E+05	1.10E+06	1.20E+09	9.3E+5 (C)	30,000st	3.4E+05st	1.4E+05st	2.1E+09st	5.1E+06 (C)nc
Toluene	<55	<52	<60	<58	<50	<56	<50	<61	6.1E+5 (C)	3.30E+06	3.60E+07	3.60E+07	1.20E+10	1.6E+8 (C)	9.7E+06st	6.4E+07st	2.8E+07st	3.8E+11st	6.7E+07 (C)nc
1,2,4-Trichlorobenzene	<280	<260	<300	<290	<250	<280	<250	<310	1.8E+7 (C)	3.40E+07	3.40E+07	3.40E+07	1.10E+10	5.8E+6 (C,DD)	27,000nc	37,000nc	28,000nc	1.5E+08nc	1.1E+06 (C)ca
1,1,2-Trichloroethane	<55	<52	<60	<58	<50	<56	<50	<61	24,000	57,000	57,000	1.20E+05	2.50E+08	8.40E+05	0.66nc	2.7nc	1.2nc	15,000nc	3.4E+05nc
1,1,1-Trichloroethane	<55	<52	<60	<58	<50	<56	<50	<61	4.60E+05	4.50E+06	1.50E+07	3.10E+07	2.90E+10	1.0E+9 (C,D)	3.7E+06st	5.8E+07st	2.4E+07st	3.5E+11st	1.0E+08 (C,D)max
Trichloroethene	<55	<52	<60	<58	<50	<56	<50	<61	1,900	14,000	25,000	58,000	5.90E+07	6.6E+5 (C,DD)	1,400 (DD)dev	17,000 (DD)dev	6,900 (DD)dev	1.0E+08 (DD)dev	2.5E+05 (DD)dev
Trichlorofluoromethane	<280	<260	<300	<290	<250	<280	<250	<310	5.1E+6(C)	1.10E+08	1.40E+11	1.40E+11	1.70E+12	2.6E+8 (C)	2.4E+05nc	5.5E+06nc	2.3E+06nc	3.4E+10nc	1.0E+08 (C,D)max
1,2,3-Trichloropropane	<100	<100	<100	<100	<100	<100	<100	<100	7,500	11,000	11,000	12,000	8.80E+06	4.2E+6 (C)	2,200nc	4,500nc	2,500nc	2.3E+07nc	1,100ca
1,3,5-Trimethylbenzene	<100	<100	<100	410	<100	<100	<100	<100	4.8E+6 (C)	1.90E+07	4.60E+08	4.60E+08	3.60E+10	1.0E+8 (C)	1.8E+05nc	8.0E+05nc	3.7E+05nc	4.6E+09nc	8.5E+06 (C)nc
1,2,4-Trimethylbenzene	<55	<52	<60	<100	<50	<100	<50	<100	8.0E+6 (C)	2.50E+07	6.00E+08	6.00E+08	3.60E+10	1.0E+8 (C)	2.2E+05nc	8.2E+05nc	3.8E+05nc	4.6E+09nc	8.5E+06 (C)nc
Vinyl acetate	<100	<100	<100	<100	<100	<100	<100	<100	1.50E+06	2.00E+06	2.70E+06	5.90E+06	5.90E+09	3.4E+7 (C,DD)	4.0E+05nc	2.6E+06nc	1.1E+06nc	1.5E+10nc	1.0E+08 (C,D)max
Vinyl chloride	<100	<100	<100	<100	<100	<100	<100	<100	2,800	29,000	1.70E+05	4.20E+05	8.90E+08	34,000	4,300ca	110,000ca	45,000ca	6.8E+08ca	46,000ca
Xylenes (Total)	<165	<152	<360	<388	<150	<166	<150	<181	1.2E+7 (C)	5.40E+07	6.50E+07	1.30E+08	1.30E+11	1.0E+9 (C,D)	5.8E+05nc	2.9E+06nc	1.3E+06nc	1.7E+10nc	1.0E+08 (C,D)max

Table 1-D
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results - Insight

									2013 MDEQ Criteria						2017 MDEQ Criteria				
	HP-1-99	HP-2-99	HP-7-99	HP-8-99	HP-8-99	HP-9-99	HP-9-99	HP-10-99	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth	*(14-16')*	*(0-2')*	*(2-4')*	*(8-10')*	*(12-14')*	*(4-6')*	*(8-10')*	*(8-10')*											
Date	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*											
SVOCs																			
Acenaphthene	<330	<330	<330	<330	na	<330	na	<330	3.50E+08	9.70E+07	9.70E+07	9.70E+07	6.20E+09	1.30E+08	1.4E+07nc	1.4E+07nc	1.4E+07nc	1.6E+10nc	5.1E+07nc
Acenaphthylene	<330	<330	<330	<330	na	<330	na	<330	3.00E+06	2.70E+06	2.70E+06	2.70E+06	1.00E+09	5.20E+06	1.8E+07nc	1.8E+07nc	1.8E+07nc	1.6E+10nc	5.1E+07nc
Aniline	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	NLV	NLV	NLV	NLV	2.90E+07	1.50E+06	NA	NA	NA	7.7E+07nc	5.8E+06ca
Anthracene	<330	<330	<330	<330	na	<330	na	<330	1.0E+9 (D)	1.60E+09	1.60E+09	1.60E+09	2.90E+10	7.30E+08	2.4E+08nc	2.4E+08nc	2.4E+08nc	7.7E+10nc	1.0E+08 (D)max
Benzidine	<5,000	<5,000	<5,000	<5,000	na	<5,000	na	<5,000	NLV	NLV	NLV	NLV	59,000	1,000 (M); 110	NA	NA	NA	45,000ca	140 (M)ca
Benzo(a)anthracene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	80,000	1.3E+06ca	1.4E+06ca	1.4E+06ca	5.0E+07ca	(Q)
Benzo(a)pyrene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	1.90E+06	8,000	NA	NA	NA	1.0E+05 (DD)dev	41,000ca
Benzo(b)fluoranthene	<330	<330	<330	<330	na	<330	na	<330	ID	ID	ID	ID	ID	80,000	NA	NA	NA	5.0E+07ca	(Q)
Benzo(ghi)perylene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	3.50E+08	7.00E+06	NA	NA	NA	5.4E+08nc	2.1E+06nc
Benzo(k)fluoranthene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	8.00E+05	NA	NA	NA	5.0E+08ca	(Q)
4-Bromophenyl phenyl ether	<330	<330	<330	<330	na	<330	na	<330	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Butyl benzyl phthalate	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	2.10E+10	1.2E+8 (C)	NA	NA	NA	6.0E+10nc	9.9E+06 (DD)dev
4-Chloro-3-methylphenol	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	1.50E+07	NA	NA	NA	NA	5.0E+07 (DD)dev
4-Chloroaniline	<1,300	<1,300	<1,300	<1,300	na	<1,300	na	<1,300	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Bis(2-chloroethoxy)methane	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	ID	NA	NA	NA	NA	2.1E+05nc
Bis(2-chloroethyl)ether	<330	<330	<330	<330	na	<330	na	<330	44,000	13,000	13,000	13,000	1.20E+07	58,000	1,800ca	2,300ca	1,800ca	9.1E+06ca	30,000ca
Bis(2-chloroisopropy)ether	<330	<330	<330	<330	na	<330	na	<330	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2-Chloronaphthalene	<330	<330	<330	<330	na	<330	na	<330	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2-Chlorophenol	<330	<330	<330	<330	na	<330	na	<330	8.00E+05	1.10E+06	1.10E+06	1.10E+06	5.30E+08	4.50E+06	6.8E+05 (DD)dev	6.8E+05 (DD)dev	6.8E+05 (DD)dev	9.0E+08 (DD)dev	4.0E+06 (DD)dev
4-Chlorophenyl phenyl ether	<330	<330	<330	<330	na	<330	na	<330	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Chrysene	<330	<330	<330	<330	na	<330	na	<330	ID	ID	ID	ID	ID	8.00E+06	NA	NA	NA	5.0E+09ca	(Q)
Di-n-butylphthalate	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	1.50E+09	8.7E+7 (C)	NA	NA	NA	1.0E+09 (DD)dev	3.3E+06 (C,DD)dev
Di-n-octylphthalate	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	1.40E+10	2.00E+07	4.5E+08nc	4.7E+08nc	4.7E+08nc	3.6E+10nc	1.5E+07nc
Dibenzo(ah)anthracene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	8,000	NA	NA	NA	5.0E+06ca	(Q)
Dibenzofuran	<330	<330	<330	<330	na	<330	na	<330	3.60E+06	1.60E+05	1.60E+05	1.60E+05	2.90E+06	ID	4.1E+05nc	4.1E+05nc	4.1E+05nc	3.1E+08nc	8.5E+05nc
3,3'-Dichlorobenzidine	<2,000	<2,000	<2,000	<2,000	na	<2,000	na	<2,000	NLV	NLV	NLV	NLV	8.20E+06	30,000	NA	NA	NA	8.8E+06ca	74,000ca
2,4-Dichlorophenol	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	2.30E+09	3.9E+6 (C,DD)	NA	NA	NA	8.5E+08nc	1.7E+07nc
Dimethy phthalate	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	1.50E+09	1.0E+9 (C,D)	NA	NA	NA	3.8E+09nc	8.5E+07 (C)nc
2,4-Dimethylphenol	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	2.10E+09	3.60E+07	NA	NA	NA	5.4E+09nc	1.7E+07nc
4,6-Dinitro-2-methylphenol	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2,4-Dinitrophenol	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	NLV	NLV	NLV	NLV	nc	nc	NA	NA	NA	5.4E+08nc	nc
2,6-Dinitrotoluene	<330	<330	<330	<330	na	<330	na	<330	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2,4-Dinitrotoluene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	2.00E+07	2.20E+05	NA	NA	NA	3.4E+07ca	49,000ca
bis (2-Ethylhexyl) phthalate	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	8.90E+08	1.2E+7 (C)	NA	NA	NA	1.9E+09ca	3.4E+06 (C)ca
Fluoranthene	<330	<330	<330	<330	na	<330	na	<330	1.0E+9 (D)	8.90E+08	8.80E+08	8.80E+08	4.10E+09	1.30E+08	NA	NA	NA	1.1E+10nc	4.9E+07nc
Fluorene	<330	<330	<330	<330	na	<330	na	<330	1.0E+9 (D)	1.50E+08	1.50E+08	1.50E+08	4.10E+09	8.70E+07	1.5E+07nc	1.5E+07nc	1.5E+07nc	1.1E+10nc	3.4E+07nc
Hexachlorobenzene	<330	<330	<330	<330	na	<330	na	<330	2.20E+05	56,000	56,000	56,000	8.50E+06	37,000	NA	NA	NA	NA	12,000nc
Hexachlorobutadiene	<330	<330	<330	<330	na	<330	na	<330	7.1E+5 (C)	4.60E+05	4.60E+05	4.60E+05	1.80E+08	4.7E+5 (C)	8,800ca	25,000ca	13,000ca	1.4E+08ca	4.3E+05 (C)ca
Hexachlorocyclopentadiene	<330	<330	<330	<330	na	<330	na	<330	56,000	60,000	60,000	60,000	5.90E+06	6.7E+6 (C)	780nc	2,800nc	1,300nc	1.5E+07nc	7.4E+06 (C)nc
Hexachloroethane	<330	<330	<330	<330	na	<330	na	<330	79,000	6.60E+05	1.40E+06	1.40E+06	1.00E+08	7.30E+05	14,000ca	53,000ca	25,000ca	3.0E+08ca	6.0E+05nc
Indeno(1,2,3-cd)pyrene	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	80,000	NA	NA	NA	5.0E+07ca	(Q)
Isophorone	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	8.20E+09	2.2E+7 (C)	NA	NA	NA	1.1E+10ca	3.5E+07 (C)ca
2-Methylnaphthalene	<330	<330	<330	<330	na	<330	na	<330	4.90E+06	1.80E+06	1.80E+06	1.80E+06	2.90E+08	2.60E+07	2.7E+05nc	2.8E+05nc	2.7E+05nc	7.7E+08nc	3.4E+06nc
N-Nitroso-di-n-propylamine	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	2.00E+06	5,400	NA	NA	NA	1.5E+06ca	4,700ca
N-Nitrosodiphenylamine	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	2.80E+09	7.80E+06	NA	NA	NA	NA	6.8E+06ca
Naphthalene	<330	<330	<330	<330	na	<330	na	<330	4.70E+05	3.50E+05	3.50E+05	3.50E+05	8.80E+07	5.20E+07	24,000ca	27,000ca	24,000ca	8.8E+07ca	8.5E+07nc
4-Nitroaniline	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
3-Nitroaniline	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2-Nitroaniline	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Nitrobenzene	<330	<330	<330	<330	na	<330	na	<330	1.70E+05	64,000	64,000	64,000	2.10E+07	3.40E+05	33,000ca	33,000ca	33,000ca	7.5E+07ca	1.7E+06 (C)nc
4-Nitrophenol	<1,700	<1,700	<1,700	<1,700	na	<1,700	na	<1,700	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
2-Nitrophenol	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	ID	2.00E+06	2,700nc	2,700nc	2,700nc	3.9E+06nc	1.7E+06nc
Octachlorocyclopentene	<330	<330	<330	<330	na	<330	na	<330	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Pentachlorophenol	<3,400	<3,400	<3,400	<3,400	na	<3,400	na	<3,400	ID	ID	ID	ID	1.30E+08	3.20E+05	NA	NA	NA	2.7E+07ca	65,000ca
Phenanthrene	<330	<330	<330	<330	na	<330	na	<330	5.10E+06	1.90E+05	1.90E+05	1.90E+05	2.90E+06	5.20E+06	28,000nc	29,000nc	29,000nc	7.7E+06nc	2.6E+07nc
Phenol	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	1.80E+10	2.3E+8 (C,DD)	NA	NA	NA	1.5E+10nc	1.0E+08 (D)max
Pyrene	<330	<330	<330	<330	na	<330	na	<330	1.0E+9 (D)	7.80E+08	7.80E+08	7.80E+08	2.90E+09	8.40E+07	1.1E+08nc	1.2E+08nc	1.2E+08nc	7.7E+09nc	3.7E+07nc
1,2,4-Trichlorobenzene	<330	<330	<330	<330	na	<330	na	<330	1.8E+7 (C)	3.40E+07	3.40E+07	3.40E+07	1.10E+10	5.8E+6 (C,DD)	27,000nc	37,000nc	28,000nc	1.5E+08nc	1.1E+06 (C)ca
2,4,6-Trichlorophenol	<330	<330	<330	<330	na	<330	na	<330	NLV	NLV	NLV	NLV	1.30E+09	3.30E+06	NA	NA	NA	9.7E+08ca	3.0E+06ca

Table 1-D
Hemphill Rd Industrial Land, Burton, Michigan
Soil Analytical Results - Insight

									2013 MDEQ Criteria						2017 MDEQ Criteria				
	HP-1-99	HP-2-99	HP-7-99	HP-8-99	HP-8-99	HP-9-99	HP-9-99	HP-10-99	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 2 Meter Source Thickness	Finite VSIC for 5 Meter Source Thickness	Particulate Soil Inhalation Criteria	Nonresidential Direct Contact
Sample Depth	*(14-16')*	*(0-2')*	*(2-4')*	*(8-10')*	*(12-14')*	*(4-6')*	*(8-10')*	*(8-10')*											
Date	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*	*Mar-99*											
Chlorinated Pesticides																			
Aldrin	<20	<20	<20	<20	na	<20	na	<20	7.10E+06	2.00E+05	2.00E+05	2.00E+05	8.00E+05	4,300	6,300ca	6,500ca	6,500ca	6.1E+05ca	2,800ca
delta-BHC	<20	<20	<20	<20	na	<20	na	<20	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
beta-BHC	<20	<20	<20	<20	na	<20	na	<20	NLV	NLV	NLV	NLV	7.40E+06	25,000	NA	NA	NA	5.7E+06ca	18,000ca
alpha-BHC	<20	<20	<20	<20	na	<20	na	<20	1.60E+05	41,000	86,000	86,000	2.10E+06	12,000	NA	NA	NA	1.7E+06ca	5,300ca
gamma-BHC (Lindane)	<20	<20	<20	<20	na	<20	na	<20	ID	ID	ID	ID	ID	42,000	NA	NA	NA	NA	39,000ca
Chlordane	<89	<83	<97	<92	na	<89	na	<98	5.90E+07	4.20E+06	4.20E+06	4.20E+06	2.10E+07	1.50E+05	1.3E+05st	1.3E+05st	1.3E+05st	1.4E+07st	2.1E+05ca
gamma-Chlordane	<20	<20	<20	<20	na	<20	na	<20	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
alpha-Chlordane	<20	<20	<20	<20	na	<20	na	<20	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
4,4'-DDD	<22	<24	<24	<23	na	<22	na	<22	NLV	NLV	NLV	NLV	5.60E+07	4.00E+05	NA	NA	NA	4.3E+07ca	2.0E+05ca
4,4'-DDE	<22	<24	<24	<23	na	<22	na	<22	NLV	NLV	NLV	NLV	4.00E+07	1.90E+05	2.9E+05ca	3.0E+05ca	3.0E+05ca	3.1E+07ca	1.4E+05ca
4,4'-DDT	<22	<24	<24	<23	na	<22	na	<22	NLV	NLV	NLV	NLV	4.00E+07	2.80E+05	NA	NA	NA	3.1E+07ca	2.3E+05ca
Dieldrin	<22	<24	<24	<23	na	<22	na	<22	7.20E+05	64,000	64,000	64,000	8.50E+05	4,700	6,900ca	7,100ca	7,100ca	6.5E+05ca	3,000ca
beta-Endosulfan	<22	<24	<24	<23	na	<22	na	<22	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
alpha-Endosulfan	<20	<20	<20	<20	na	<20	na	<20	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Endosulfan sulfate	<22	<21	<24	<23	na	<22	na	<22	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Endrin	<22	<21	<24	<23	na	<22	na	<22	NLV	NLV	NLV	NLV	ID	1.90E+05	NA	NA	NA	NA	3.7E+05nc
Endrin aldehyde	<22	<21	<24	<23	na	<22	na	<22	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Endrin ketone	<22	<21	<24	<23	na	<22	na	<22	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Heptachlor	<20	<20	<20	<20	na	<20	na	<20	1.90E+06	2.10E+05	2.10E+05	2.10E+05	3.00E+06	23,000	38,000ca	40,000ca	40,000ca	2.3E+06ca	40,000ca
Heptachlor epoxide	<20	<20	<20	<20	na	<20	na	<20	NLV	NLV	NLV	NLV	1.50E+06	9,500	4,800ca	4,900ca	4,900ca	1.2E+06ca	13,000ca
Methoxychlor	<50	<50	<50	<50	na	<50	na	<50	ID	ID	ID	ID	ID	5.60E+06	NA	NA	NA	NA	3.5E+06 (DD)dev
PCBs																			
PCB-1016	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1221	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1232	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1242	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1248	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1254	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
PCB-1260	<330	<330	<330	<330	na	<330	na	<330	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	71,000ca	72,000ca	72,000ca	3.0E+07ca	20,000 (T)
Toxaphene	<220	<210	<240	<230	na	<220	na	<230	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

Notes:

1) Analytical results and criteria listed in µg/kg (ppb)
2) "--" indicates compound was not detected. Less than "<" reporting limit shown when available.
3) "*" indicates sample was collected in waste fill material (*i.e.* , debris, refuse, etc. mixed with soil) opposed to fill soil used for leveling or building activities.
4) MDEQ cleanup criteria listed in RRD Operational Memorandum #1, Attachment 1 dated December 30, 2013 and proposed MDEQ cleanup criteria August 2017.
5) C - value presented is a screening level based on the chemical-specific generic soil saturation concentration (Csat) since the calculated risk-based criterion is greater than Csat. Concentrations greater than Csat are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that free-phase material containing a hazardous substance is not present.
6) D - calculated health-based soil value exceeds 10% by dry weight, hence it is reduced to the maximum ceiling concentration of 10%.
7) DD - hazardous substance causes developmental effects. Residential and Commercial I Direct Contact criteria are protective of both prenatal and postnatal exposure. Industrial and Commercial II, III< and IV Direct Contact criteria are protective for a pregnant adult receptor.
8) L - drinking water, soils protective of drinking water and direct contact for lead are derived using a biologically based model.
9) ID - insufficient data to develop criterion.
10) MM - Hazardous substance is a carcinogen with a mutagenic mode of action. The cancer potency values used in calculating health-based values shall be modified using age-dependent adjustment factors for those carcinogenic chemicals identified as mutagenic.
11) NA - not available. "na" indicates sample not analyzed.
12) nc - indicates no criteria.
13) NLV - hazardous substance is not likely to volatilize under most conditions.
14) Q - The soil direct contact criteria for the carcinogenic polynuclear aromatic hydrocarbons (cPAH) are developed using the oral cancer slope factor (SFo) for benzo(a)pyrene.
15) T - refer to the federal Toxic Substances Control Act (TSCA). TSCA Subpart D Cleanup Standard is 1,000 ppb, or 10,000 ppb if capped. Nonresidential Part 201 Soil Direct Contact Cleanup Criteria is 16,000 ppb.
16) Samples collected by Insight.

TABLE 1E
Hemphill Road Industrial Land, Burton, Michigan
Soil Analytical Summary - Exceedances

MDEQ Criteria		Lead	Ethylbenzene
2013	Volatilization to Indoor Air Inhalation Criteria	NLV	4.6E+5 (C)
	Infinite Source Volatile Soil Inhalation Criteria	NLV	2.40E+06
	Finite VSIC for 5 Meter Source Thickness	NLV	3.10E+06
	Finite VSIC for 2 Meter Source Thickness	NLV	6.50E+06
	Particulate Soil Inhalation Criteria	4.40E+07	1.30E+10
	Nonresidential Direct Contact Criteria	900,000 (DD)	7.1E+7 (C)
2017	Infinite Source Volatile Soil Inhalation Criteria	NA	41,000ca
	Finite VSIC for 2 Meter Source Thickness	NA	2.1E+05ca
	Finite VSIC for 5 Meter Source Thickness	NA	92,000ca
	Particulate Soil Inhalation Criteria	1.2E+07 (L)nc	1.2E+09ca
	Nonresidential Direct Contact Criteria	760,000 (L,DD)	3.0E+06 (C) ca

Sample Location	*Sample Depth*	*Date*		
S-34	(14.5')*	Nov-87	**1,400,000**	--
S-34	(18.5')*	Nov-87	770,000	--
S-34	(24.5')*	Nov-87	850,000	--
SB-1	(10')*	Feb-88	**1,970,000**	--
SB-8	(19')*	Feb-88	770,000	--
SB-8	(24.5')*	Feb-88	**3,970,000**	--
SB-8	(29')*	Feb-88	**2,450,000**	--
SB-9	(19')*	Feb-88	**930,000**	--
OBG SB-2	(6-8')*	Aug-97	**1,100,000**	--
OBG SB-4	(2-4')*	Aug-97	**3,900,000**	--
OBG SB-7	(8-10')*	Aug-97	**1,100,000**	--
OBG SB-8	(4-6')*	Aug-97	810,000	--
OBG SB-23	(4-6')*	Aug-97	--	49,000

Notes:

1) Analytical results and criteria listed in µg/kg (ppb)

2) "--" indicates compound was not detected or was below cleanup criteria.

3) "*" indicates sample was collected in waste fill material (*i.e.* , debris, refuse, etc. mixed with soil) opposed to fill soil used for leveling or building activities.

4) **Bold** values indicate a concentration above the December 30, 2013 MDEQ cleanup criteria.

5) MDEQ cleanup criteria listed in RRD Operational Memorandum #1, Attachment 1 dated December 30, 2013 and proposed cleanup criteria August 2017.

6) C - The criterion developed under R 299.20 to R 299.267 exceeds the chemicalspecific soil saturation screening level (Csat).

7) D - calculated health-based soil value exceeds 10% by dry weight, hence it is reduced to the maximum ceiling concentration of 10%.

8) DD - hazardous substance causes developmental effects. Residential and Commercial I Direct Contact criteria are protective of both prenatal and postnatal exposure. Industrial and Commercial II, III< and IV Direct Contact criteria are protective for a pregnant adult receptor.

9) L - drinking water, soils protective of drinking water and direct contact for lead are derived using a biologically based model.

10) NA - not available. "na" indicates sample not analyzed.

11) NLV - hazardous substance is not likely to volatilize under most conditions.

FIGURES

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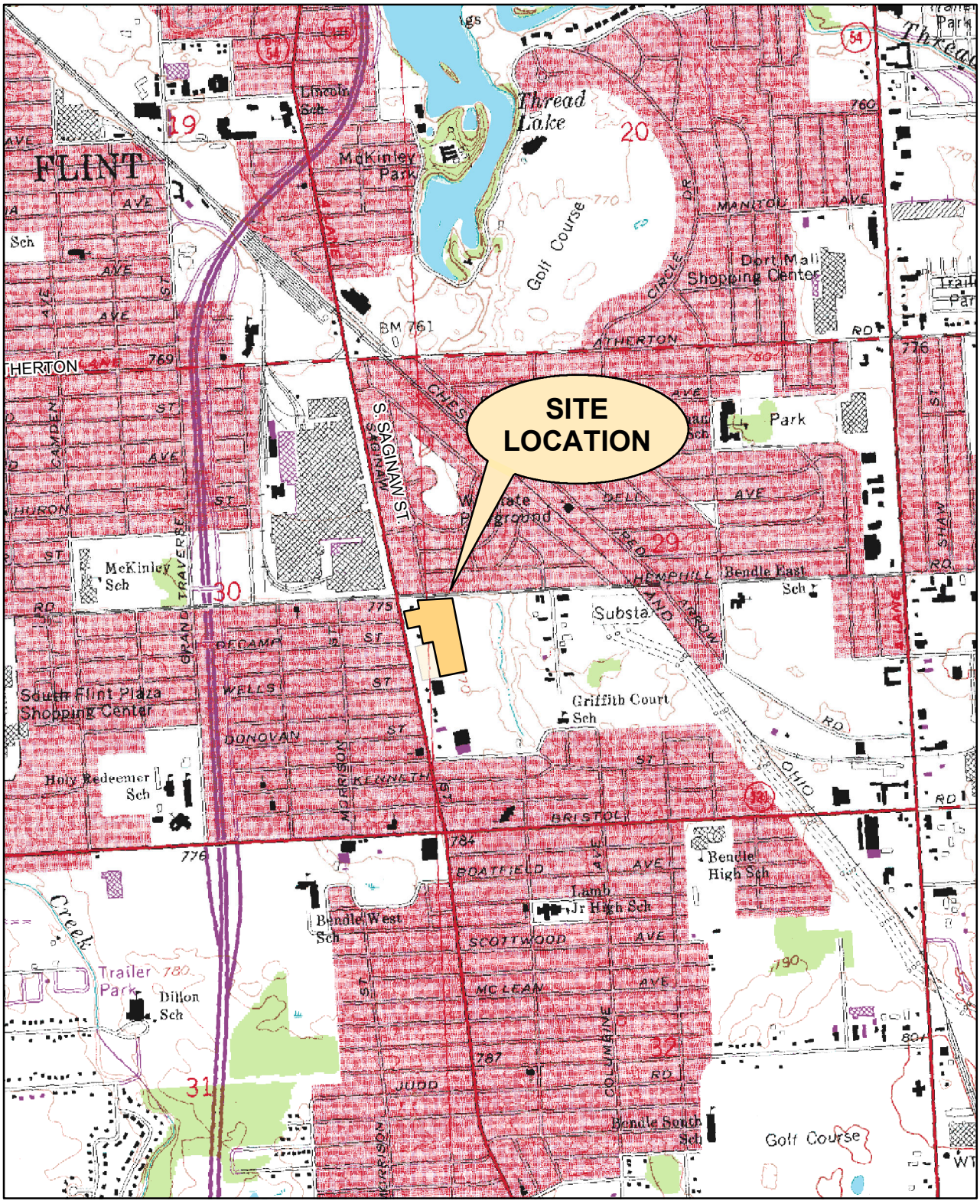

RACER TRUST
HEMPHILL ROAD INDUSTRIAL LAND
BURTON, MICHIGAN

SITE LOCATION MAP

0 1,000 2,000 4,000
Feet

N

FILE_NO. 68544
FEBRUARY 2018

O'BRIEN & GERE ENGINEERS, INC.

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OBG SB-8 SOIL 4-6 fbg (Aug-97)
Lead - 810,000 ug/kg (2017 DCC)

OBG SB-7 SOIL 8-10 fbg (Aug-97)
Lead - 1,100,000 ug/kg (2013 DCC)

S-34 SOIL 14.5 fbg (Feb-88)
Lead - 1,400,000 ug/kg (2013 DCC)
S-34 SOIL 18.5 fbg (Feb-88)
Lead - 770,000 ug/kg (2017 DCC)
S-34 SOIL 24.5 fbg (Feb-88)
Lead - 850,000 ug/kg (2017 DCC)

OBG SB-23 SOIL 4-6 fbg (Aug-97)
Ethylbenzene - 49,000 ug/kg (2017 ISVSIC)

SB-1 SOIL 10 fbg (Feb-88)
Lead - 1,970,000 ug/kg (2017 DCC)

SB-9 SOIL 19 fbg (Feb-88)
Lead - 930,000 ug/kg (2013 DCC)

OBG SB-2 SOIL 6-8 fbg (Aug-97)
Lead - 1,100,000 ug/kg (2013 DCC)

SB-8 SOIL 19 fbg (Feb-88)
Lead - 770,000 ug/kg (2017 DCC)
SB-8 SOIL 24.5 fbg (Feb-88)
Lead - 3,970,000 ug/kg (2013 DCC)
SB-8 SOIL 29 fbg (Feb-88)
Lead - 2,450,000 ug/kg (2013 DCC)

OBG SB-4 SOIL 2-4 fbg (Aug-97)
Lead - 3,900,000 ug/kg (2013 DCC)

Notes:
(2013 DCC) = December 30,2013 MDEQ Direct Contact Criterion
(2017 DCC) = August 29,2017 Proposed MDEQ Direct Contact Criterion
(2017 ISVSIC) = August 29,2017 Proposed MDEQ Infinite Source Volatile Soil Inhalation Criterion

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- MONITORING WELL
- LNAPL ASSESSMENT MONITORING WELL
- HISTORICAL SOIL BORING LOCATION
- STOCKPILE SAMPLE LOCATION
- PROPOSED VI LOCATION
- SOIL STOCKPILE AREA
- FORMER BUILDINGS
- ESTIMATED DEPTH OF WASTE FILL BASED ON O'BRIEN & SOIL BORINGS AND HISTORICAL TOPOGRAPHIC REVIEW

RACER TRUST
HEMPHILL ROAD INDUSTRIAL LAND
BURTON, MICHIGAN

SOIL SAMPLE LOCATIONS AND PROPOSED SOIL VAPOR SAMPLE LOCATIONS

0 50 100 150 200
Feet

N

O'BRIEN & GERE ENGINEERS, INC.

FILE_NO. 68544
MAY 2018

I:\Racer-Trust.15388\68544.Hemphill-2018-6\Docs\Reports\Soil Cover Work Plan\Figures\003 - Figure 3 VI Locations.mxd

FIGURE 3

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LEGEND

- INCREMENTAL SAMPLE LOCATION
- MONITORING WELL
- LNAPL ASSESSMENT MONITORING WELL
- HISTORICAL SOIL BORING LOCATION
- FORMER BUILDINGS
- ESTIMATED DEPTH OF WASTE FILL BASED ON O'BRIEN & SOIL BORINGS AND HISTORICAL TOPOGRAPHIC REVIEW

FILE_NO. 68544
DATE: JUNE 2018

RACER TRUST
HEMPHILL ROAD INDUSTRIAL LAND
BURTON, MICHIGAN

INCREMENTAL SAMPLING GRID

0 25 50 75 100
Feet

N

O'BRIEN & GERE ENGINEERS, INC.

Attachment A – Historical Sampling Figure

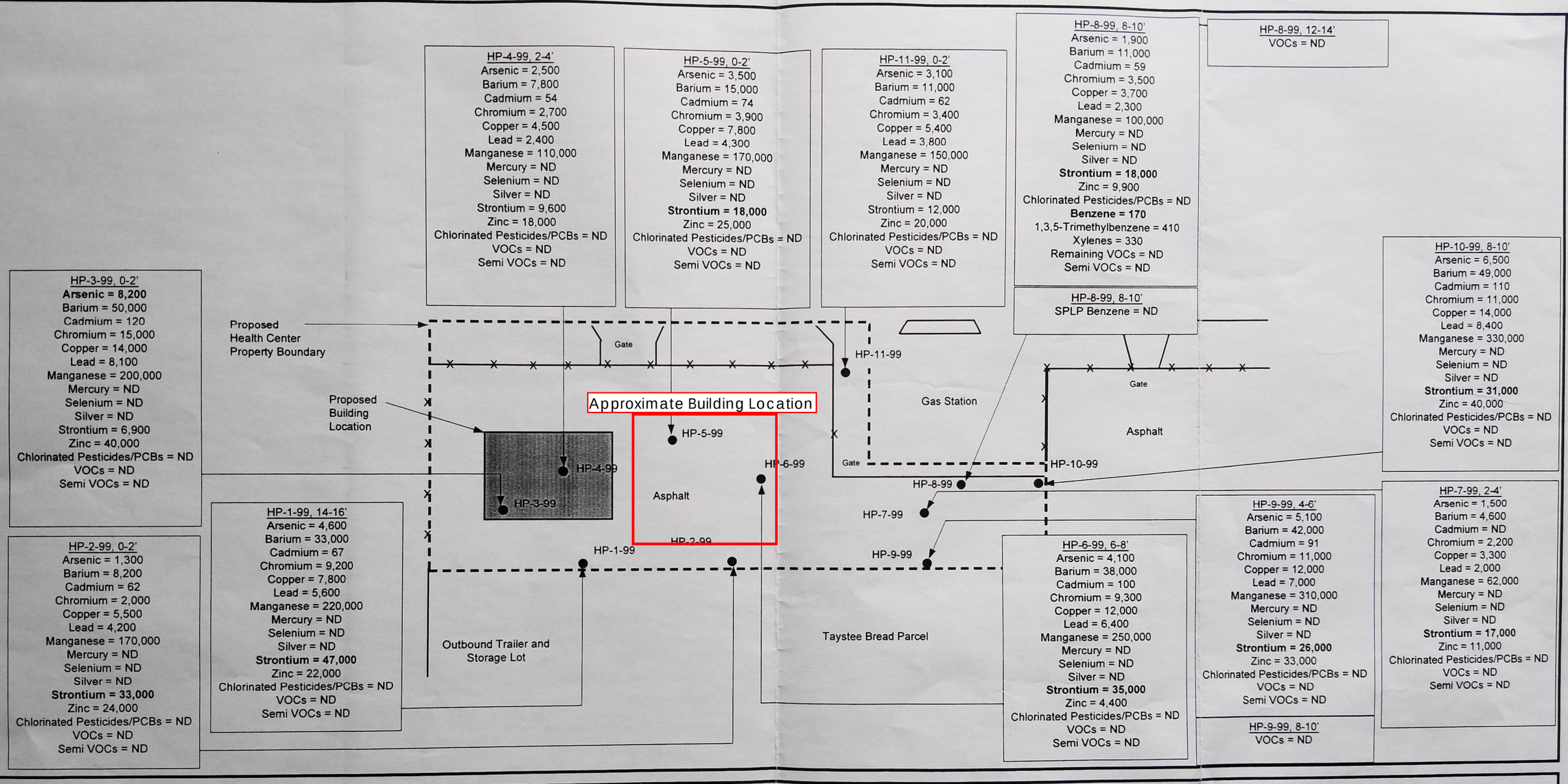

FIGURE 3

Source: Soil Boring Locations Based On Field Measurements

Attachment B – Soil Vapor (Bottle Vac®) Sample Collection Field Form

Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # _____ Date _____

Project Name _____ Collector _____

Sample ID _____ Vacuum gauge "zero" ("Hg) _____

Start Date/Time _____ Start Pressure ("Hg) _____

End Date/Time _____ End Pressure ("Hg) _____

Bottle/Canister ID _____ End pressure = "zero"? _____

Flow controller ID _____ Sampling duration (intended) _____

Associated ambient air sample ID N/A Depth of sample point below grade _____

Analytical method required TO-15 Laboratory used _____

Tubing type/inside dia. used _____ Length of tubing _____ cm Tubing volume _____ cc

Volume purged _____ cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? _____

Shroud tracer gas conc. Beginning: _____ End of purging: _____ End of sampling: _____

Gas Analyzer Readings $\%O_2$ N/A $\%CO_2$ N/A $\%CH_4$ N/A PID/FID reading _____ (ppmv)

Noticeable odor _____ Soil type _____

Weather Conditions during Probe Installation:

Air temperature (^oF) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (^oF) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: _____