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September 30, 2013

Mr. Joseph Kelly
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Subject: Supplement to the Current Human Exposures Environmental Indicator Report and Proposed Extension Pursuant to Paragraph 21 of the AOC; RCRA 3008(h) Administrative Order on Consent (AOC) (RCRA-05-2010-0012) – Tecumseh Products Company – MID 005-049-440

Dear Mr. Kelly:

A project meeting was conducted between the United States Environmental Protection Agency (USEPA) and Tecumseh Products Company (TPC) on October 29-30, 2012 to discuss the status of environmental work underway at the former TPC site in Tecumseh, Michigan. As confirmed in a March 6, 2013 letter from Jose Cisneros of USEPA summarizing the project meeting:

“After reviewing [the 9/28/12 Groundwater EI Report and the RI Report], in October 2012 EPA requested the installation of additional monitoring wells during the first half of 2013, and quarterly sampling events from those wells. TPC has agreed to perform the additional investigation, sampling, and analysis and submit the results in a Supplement to the Groundwater EI Report. Therefore, the 30-month period set forth in paragraphs 11 and 13(b) of the AOC is hereby extended to **July 31, 2015**, by which date TPC shall submit the Supplement to the RI and Groundwater EI Report demonstrating that the migration of contaminated groundwater is under control.”

In addition, Mr. Cisneros' March 6, 2013 letter confirmed that:

“Pursuant to paragraph 13(a) of the AOC, on September 29, 2011, TPC submitted the Current Human Exposures Under Control Environmental Indicator Demonstration Report (Current Human Exposure EI Report) to the EPA. Subsequently, by letter dated December 28, 2011, from Jose Cisneros, Chief, Region 5 Remediation and Reuse Branch, the EPA extended the date for the Current Human Exposure EI demonstration to December 12, 2012, to allow time

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for additional sub slab and crawl space soil gas sampling requested by EPA. In October 2012, EPA requested additional quarterly monitoring data from soil gas sample points in the vicinity of the on-site soil vapor extraction (SVE) system, through the second quarter, June of 2013. TPC has agreed to perform the additional data collection, analysis, and evaluation and to submit the results in a Supplement to the Current Human Exposures EI Report. Therefore, the date for the Current Human Exposure EI demonstration is hereby extended to **September 30, 2013**, by which date TPC shall submit the Supplement to the Current Human Exposures EI Report.”

As indicated above, TPC agreed to perform additional sampling and investigation activities related to the Groundwater Environmental Indicator (EI) Determination and the Human Exposures EI Determination, and provide additional submittals to address USEPA comments provided during that meeting.

Pursuant to Paragraph 13(a) of the AOC, TPC submitted the Current Human Exposures Under Control Environmental Indicator Demonstration Report (Current Human Exposures EI Report) by the 18-month deadline set forth in the AOC, September 29, 2011. Subsequently, as indicated above, in a letter dated December 28, 2011, from Jose Cisneros, Chief, Region 5 Remediation and Reuse Branch, the USEPA extended the date for the Current Human Exposures EI demonstration to December 12, 2012, to allow time for additional sub-slab and crawl space soil gas sampling requested by USEPA. In October 2012, USEPA requested additional quarterly monitoring data from soil gas sample points in the vicinity of the on-site SVE system, through the second quarter of 2013. TPC agreed to perform that additional data collection, analysis and evaluation and to submit the results in a Supplement to the Current Human Exposures EI Report, by the date provided by USEPA in its March 6, 2013 letter, **September 30, 2013**.

The details of the additional work described above were contained in a Technical Memorandum that was attached for reference to the USEPA’s March 6, 2013 letter.

In addition, in a letter dated March 6, 2013 from Project Manager Joe Kelly, USEPA approved the scope of work for additional investigation contained in TRC’s Revised Supplemental Groundwater Investigation Workplan and Revisions to the Quarterly Groundwater Compliance Monitoring Program, stating “The results of the additional investigation will be used to evaluate TPC’s compliance with Section 13b of the Administrative Order on Consent (RCRA-05-2010-0012), dated March 30, 2010.”

As specified in the AOC and confirmed in Mr. Cisneros’ March 6, 2013 letter, the Current Human Exposures EI demonstration is not dependent on either completion of the Remedial Investigation (to be completed pursuant to Paragraph 11 of the AOC) or the Groundwater EI Determination (to be



completed pursuant to Paragraph 13(b) of the AOC.) In fact, as indicated above, concurrent with the extension of the Current Human Exposures EI demonstration, USEPA also extended the 30-month period set forth in Paragraphs 11 and 13(b) of the AOC until **July 31, 2015** so that additional groundwater investigation, sampling and analysis could be completed prior to the extended Groundwater EI Determination deadline.

Supplemental data which support the Current Human Exposures Demonstration have been provided to USEPA as they became available. Submittals included:

- September 2011: A workplan to install a sub-slab depressurization/ventilation (SSDV) system at S-Building.
- October 2011: A technical memorandum documenting third quarter 2011 groundwater and surface water sample data.
- November 2011: Crawl space sample data from samples collected in October 2011.
- November 2011: A construction documentation report, including exhaust sample data for the SSDV system installed at 704 Mohawk Street in October 2011.
- December 2011: Indoor air and exhaust sample data from samples collected at 704 Mohawk Street in November 2011.
- December 2011: A Response to USEPA Comments Dated December 5, 2011 Regarding the Environmental Indicator Report for Human Health Under Control.
- January 2012: A technical memorandum documenting fourth quarter 2011 groundwater and surface water sample data.
- January 2012: A technical memorandum documenting third and fourth quarter 2011 soil gas sample data.
- February 2012: A calculation package documenting indoor air, soil gas and groundwater screening levels for vapor intrusion which were updated to reflect new trichloroethene (TCE) toxicity data.
- February 2012: A construction documentation report, including indoor air sample data, for the SSDV system installed in S-Building in October 2011.
- February 2012: The construction documentation report for the permeable reactive barrier (PRB).
- March 2012: First quarter 2012 soil gas sample data.
- March 2012: A technical memorandum summarizing the status of well survey and well decommissioning activities.

- March 2012: A copy of the Asbestos Inspection and Lead Based Paint Inspection Report (also submitted to the new site owner).
- April 2012: A workplan for the pilot SVE system.
- April 2012: A technical memorandum documenting first quarter 2012 groundwater and surface water sample data.
- April 2012: The findings of the expanded search for licensed child care providers in the vicinity of the site (included in the First Quarter 2012 Quarterly Progress Report).
- May 2012: Indoor air sample data from samples collected at S-Building in February 2012.
- May 2012: A workplan for the installation of the full-scale SVE system.
- June 2012: Crawl space sample data from samples collected in May 2012.
- June 2012: Indoor air and exhaust sample data from samples collected at 704 Mohawk Street in May 2012.
- June 2012: Isoconcentration maps and second quarter 2012 groundwater and surface water data, including initial sample results from the seep sample location (SEEP) which residents allegedly used as a drinking water source.
- June 2012: A statistical evaluation of groundwater stability.
- July 2012: A workplan for additional remedial investigation activities.
- August 2012: A technical memorandum including subsurface utility maps, an evaluation of the protectiveness of the clay layer northeast of the site, documentation of the installation of additional soil gas sample points, and preliminary soil gas sample data from those locations.
- September 2012: A performance monitoring report for the PRB.
- September 2012: The Remedial Investigation and Groundwater Environmental Indicator Report. This Report included:
 - Groundwater, surface water, and soil gas data collected through the August 2012;
 - Documentation of the 2012 remedial investigation activities including updated cross sections and isoconcentration maps;
 - A calculation package documenting how the site-specific groundwater contact criterion for TCE was determined;
 - Phase II Environmental Site Assessment data collected by ATC which had been tabulated and compared to applicable screening criteria; and

- A letter report documenting completion of well decommissioning activities in the area restricted by the groundwater use ordinance.
- December 2012: A technical memorandum summarizing action items from the October 2012 project meeting, which USEPA reviewed prior to finalization.
- January 2013: Crawl space sample data from samples collected in November 2013.
- January 2013: Indoor air and exhaust sample data from samples collected at 704 Mohawk Street in November 2012.
- January 2013: A technical memorandum documenting third and fourth quarter 2012 soil gas sample data.
- January 2013: Tables summarizing potential human exposure scenarios.
- January 2013: A workplan for additional remedial investigation activities.
- February 2013: A construction documentation report for the SVE system, including:
 - SVE system exhaust concentration and flow data; and
 - Ambient air concentration data.
- February 2013: A revised (to address USEPA comments) workplan for additional remedial investigation activities.
- April 2013: A report documenting the first quarter 2013 SSDV system inspection at 704 Mohawk.
- June 2013: A report documenting the second quarter 2013 SSDV system inspection at 704 Mohawk.
- July 2013: A technical memorandum summarizing the findings of the 2013 remedial investigation activities including first and second quarter 2013 groundwater and surface water data.
- July 2013: A technical memorandum documenting first and second quarter 2013 soil gas sample data.
- September 2013: The second annual PRB performance monitoring report.
- September 2013: A report documenting the third quarter 2013 SSDV system inspection at 704 Mohawk.

As requested by USEPA, the attached Supplement to the Current Human Exposures Environmental Indicator Report (Supplement) is a compilation of these supplemental data. This Supplement includes data and critical reviews of those data collected and prepared to address all of the above-mentioned specific comments that USEPA provided which are related to the Current Human

Exposures Under Control Determination. These data support and further demonstrate that all current human exposures are under control (and were under control as of the original Human Exposure Under Control EI Report) as required under Paragraph 13(a) of the AOC.

Based on numerous communications with USEPA in the past year, including the March 6, 2013 Extension of Project Deadlines, TPC had the firm understanding that the only issues remaining for USEPA regarding the Current Human Exposures Determination was the completion of additional soil gas sample events north of the site to confirm the effectiveness of the SVE system. As recently as July 29, 2013, email communications with you have supported that understanding. (In a July 29, 2013 email, Mr. Kelly {USEPA Project Manager} referred to the September 30, 2013 deadline as “meeting Bhooma’s request regarding the *punch items* with the coming deadline for the EI.” {emphasis added.}) Soil gas data were provided on a regular basis as they were completed. Other requests tied to the Human Exposures EI Determination, which were primarily requests for TPC to make the data more accessible for quick review, were also completed and submitted as quickly as feasible (e.g. providing a summary of the conceptual site model (CSM) in table format, incorporating data from the Phase II investigation conducted by the property buyer into existing data tables, providing lead and asbestos reports to the new owner {and USEPA}, etc.).

However, during a conference call on September 12, 2013, USEPA indicated that it was not satisfied with the data collected thus far, but was unwilling or unable to provide specific comments on the Current Human Exposures Determination. The nature of USEPA comments during that call centered around the relatively short time period between the July 15, 2013 submittal which documented the results of supplemental groundwater investigation activities conducted in March and April 2013, and the date for submittal of the Supplement to the Current Human Exposures EI Determination (September 30, 2013) as well as the increasing concentrations of vinyl chloride at monitoring well MW-23 northeast of the site. The 2013 investigation activities were completed to fine tune the CSM and support the Groundwater EI Determination (deadline July 31, 2015), not the Current Human Exposures Determination. Furthermore, those findings do not affect the CSM as it relates to current human exposures. The east-northeast component of groundwater flow in the area northeast of the site has been documented since the September 2009 Current Conditions Report. Similarly, the increasing trend observed at monitoring well MW-23 was documented when groundwater stability was first evaluated in June 2012. Groundwater elevation data suggest that affected groundwater in the vicinity of monitoring well MW-23 will vent to the River Raisin south of East Chicago Boulevard (within the area of the Groundwater Use Ordinance). However, to be conservative, TRC also conducted an electronic well survey. The survey area included the area from the corner of Maumee Street and East Chicago Boulevard north and east to the River Raisin. This area is within the City of Tecumseh and has access to municipal water. A search of publicly available water well logs was conducted through the Michigan Department of Environmental Quality (MDEQ) website (Well Logic System and historical well logs database). There are no well logs for any of the properties located in



September 30, 2013

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this area. TPC will continue groundwater monitoring and investigation activities, as appropriate, to verify the Groundwater EI demonstration in the area northeast of the site. However, both site hydrogeology (groundwater flow direction) and current site conditions (municipal water and no wells) support TPC's Current Human Exposures Under Control EI Demonstration.

If upon review of the attached Supplement, USEPA is unable to complete its review of the Current Human Exposures Under Control Demonstration, then TPC proposes that the Project Managers agree to extend the September 30, 2013 deadline for an additional 90 days, as allowed pursuant to Paragraph 21 of the AOC.

If you have any questions regarding the Supplement, please contact me at 734-585-7813.

Sincerely,

TRC Environmental Corporation


Graham Crockford, C.P.G.
Project Manager

Attachment: Supplement to the Current Human Exposures Under Control Environmental Indicator Report

cc: Susan Perdomo, USEPA
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Tecumseh District Library – Public Repository
Central Files



Attachment 1
Supplement to the Current Human Exposures Under Control
Environmental Indicator Report



Supplement to the Current Human
Exposures Under Control Environmental
Indicator Report

RCRA-05-2010-0012
Former Tecumseh Products Company Site
Tecumseh, Michigan

September 2013



Supplement to the Current Human Exposures Under Control Environmental Indicator Report

RCRA-05-2010-0012

*Former Tecumseh Products Company Site
Tecumseh, Michigan*

September 2013

*Prepared For
Tecumseh Products Company*

A handwritten signature in black ink, appearing to read "Graham Crockford", written over a horizontal line.

Graham Crockford
Project Manger

A handwritten signature in blue ink, appearing to read "Stacy Metz", written over a horizontal line.

Stacy Metz
Environmental Scientist

TRC Environmental Corp. | Tecumseh Products Company

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Section 1

Introduction

This Supplement to the Current Human Exposures Under Control Environmental Indicator Report (Supplement) has been prepared by TRC Environmental Corporation (TRC) on behalf of the Respondent, Tecumseh Products Company (TPC). The United States Environmental Protection Agency (USEPA) facility identification number for the site is MID-005-049-440 and the Administrative Order on Consent (AOC) identification number is RCRA-05-2010-0012.

1.1 Purpose and Scope

This Supplement provides additional supporting documentation for the completion of Form CA725, Documentation of Environmental Indicator Determination – Current Human Exposures Under Control (Determination), for the former Tecumseh Products Company Site located in Tecumseh, Michigan. In September 2011, the Current Human Exposures Under Control Environmental Indicator (Human Exposures EI) Report was submitted to the USEPA as required under Section VI, Paragraph 13(a) of the RCRA 3008(h) AOC, effective March 29, 2010. During various meetings and in project communications, USEPA has requested additional information, e.g. completion of additional sample events to confirm the September 2011 evaluation of current human exposures. These data have been provided to USEPA as they became available. This Supplement provides a comprehensive summary and compilation of those data, as well as background information to support those data, as appropriate. Note that USEPA has not provided comments or expressed concerns related to the 2011 evaluation of exposures to soil or sediment. Therefore those media are not considered in this Supplement. Tables 1 and 2 provide a summary of the conceptual site model (CSM) and an evaluation of current and potential human exposures to affected media.¹

1.2 Site Description

The former TPC site is located at 100 East Patterson Street in Tecumseh, Michigan (Figure 1). The site is comprised of two parcels which occupy a total of approximately 50.5 acres. Parcel number 325-0241-00 occupies 47.1 acres and is located along the northern portion of the site. This parcel includes an expanse of interconnected buildings/building additions that occupy approximately 750,000 square feet. Portions of the building have been, or are in the process of being, demolished by the current property owner. Parcel Number 325-0250-00 is a 3.4-acre grassy parcel located outside of the southern site fence.

¹ As requested by USEPA during the October 2012 project meeting, these tables were prepared and submitted to USEPA with the Fourth Quarter 2012 Quarterly Progress Report on January 15, 2013.

Section 2

Project Background

2.1 Site Operations

The former TPC site is occupied by a series of interconnected buildings/building additions that occupy approximately 750,000 square feet (main building). There are other buildings on site, but they are significantly smaller in size, and were typically not utilized for manufacturing operations. Letter designations, *i.e.*, Area K, Q-Building, etc., for each building/building addition are shown on Figure 2. A summary of site operations through September 2011 is provided in the September 2011 Human Exposures EI Report. Site Operations since that time are summarized below:

- In September 2011, up to 30 TPC employees continued to lease occupy the office and engineering portions of the main building (Areas H, J, and Z). These staff remained on site following the purchase of the site through a temporary lease agreement. TPC purchased a new research and testing facility in November 2010. Relocation of equipment and staff was completed in June 2012.
- In February 2012, the site was purchased by Tecumseh Food, Machinery & Engineering, LLC (TFME). When TFME purchased the site, on-site security was dismissed.
- Since February 2012, the site has been occupied by the new TFME site manager who works out of an office located in the old security area (S-Building), and intermittently by several temporary TFME employees who are in the process of scrapping the equipment that TFME has stored on site. TFME is the current owner.
- Currently, TFME plans to separate P-Building and S-Building from the remainder of the plant, so that P-Building can be leased or sold as a separate parcel, and to demolish the remainder of the facility. Currently, demolition plans are phased with demolition activities beginning in the south and moving north (Figure 2). Phase I of the demolition was completed in July 2013. The Phase I demolition area included Area V including Areas V-1 and V-2, Area G including Areas G-1 and G-2, Q-Building Q, and Building X-1. Phase II demolition is expected to be completed in 2013. The Phase II demolition area includes Area M including Areas MD, M-1 and M-2, and Area Y.

During the March 2012 project meeting, USEPA expressed concern that lead paint and asbestos reports had not been provided to the new owner. At USEPA's request, TPC ensured that the site owner had copies of those reports in March 2012 prior to the start of demolition.

2.2 Summary of Site Investigation Activities

In 2008, a Phase I Environmental Site Assessment (ESA) was conducted by Atwell-Hicks, LLC as part of the sale of the facility. The Phase I ESA Report recommended that a Phase II Subsurface Investigation be conducted to address the recognized environmental conditions identified in the Phase I ESA. A Phase II ESA was performed by ATC Environmental Consultants (ATC) on behalf of the buyer between December 2008 and January 2009. A copy of the Draft Limited Phase II ESA Report was provided to TPC in February 2009. The Phase II ESA Report was finalized on September 4, 2009.

After review of the Draft Phase II ESA Report, TRC concluded that there was a potential for off-site migration of VOCs above the Michigan Department of Environmental Quality (MDEQ) Part 201 generic cleanup criteria (Part 201 criteria). Therefore remedial investigation activities, conducted by RMT, Inc. (now TRC), on behalf of TPC, were initiated. In September 2009, RMT, Inc. submitted a Current Conditions Report (CCR) to the USEPA and the MDEQ, and on March 29, 2010 the RCRA 3008(h) AOC (RCRA-05-2010-0012) for the site (MID-005-049-440) was executed.

Since that time TPC has been working cooperatively with USEPA to complete investigation activities and remedial activities pursuant to Section VI, Work to be Performed, of the AOC. Investigation activities to address USEPA comments and to support remedial design are ongoing. A detailed chronology of investigation activities conducted to date is provided in Appendix A. Investigation activities are routinely summarized in reports and technical memoranda for USEPA's review and comment.

2.3 Constituents of Concern

The Phase II ESA included sampling and analysis for a wide range of constituents. Based on a review of those data, volatile organic compounds (VOCs), particularly chlorinated VOCs (CVOCs), have been identified as constituents of concern (COCs) at the site. In particular, the solvents trichloroethene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA) were used for degreasing operations. These compounds and their breakdown products: 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-DCE), trans-1,2-dichloroethene (trans-DCE), and vinyl chloride have been identified as the primary COCs in on-site soil and/or groundwater. In addition to VOCs, initial investigation activities included testing for 1,4-dioxane a compound commonly used to stabilize 1,1,1-TCA. 1,4-dioxane was detected at only two on-site locations, and was subsequently eliminated as a potential COC (RMT 2009). VOC data are summarized in Table 3 (soil) and Table 4

(groundwater). Data from the other constituents, including 1,4-dioxane, metals, and semi-volatile organic compounds, are tabulated and compared to risk-based criteria in Appendix B².

² Data collected by ATC were originally tabulated and included in the Phase II ESA. Copies of these tables were originally provided to USEPA with the September 2009 CCR. As requested by USEPA during the March 2012 project meeting, TRC revised the tables, which included soil and groundwater VOC data collected on behalf of TPC, to also to include the VOC data collected by ATC. Revised tables, which compared other constituents to applicable criteria/screening levels, were also created. These tables were originally submitted to USEPA with the September 2012 RI/EI Report.

Section 3 Site Setting

The site setting is described in the Human Exposures EI Report. Investigation activities conducted since September 2011 confirm the validity of the CSM described in the Human Exposures EI Report. TRC has used data from additional investigation activities to refine the CSM. In that process, TRC revised existing figures and created new figures to further illustrate the site setting, to support the CSM, and to address specific USEPA requests. New and revised figures were submitted to USEPA in the August 2012 technical memorandum addressing vapor intrusion potential, in the September 2012 Remedial Investigation and Groundwater Environmental Indicator Report (RI/EI Report), and in July 2013, following supplemental remedial investigation activities conducted in March/April 2013. New and revised figures include geologic cross-sections, a map illustrating major utilities (including an evaluation of where those utilities are submerged), a map illustrating the extent of the intermediate clay layer, groundwater contour maps, isoconcentration maps, and a map illustrating the elevation of the top of the clay confining unit.

Section 4

Groundwater

4.1 Risk-Based Screening Levels for Groundwater

The September 2011 Human Exposures EI Report compares groundwater concentrations to the generic cleanup criteria specified in the MDEQ Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), also known as Part 201 Criteria. Part 201 Criteria are the risk-based screening levels typically used to evaluate groundwater data.

Risk-based screening levels used to evaluate groundwater data include:

- Residential Health-Based Drinking Water (DW) Criteria,
- Non-Residential Health-Based DW Criteria, and
- Groundwater Contact (GC) Criteria,

During the March 2012 project meeting, USEPA requested that the site-specific groundwater contact criteria be calculated for TCE to reflect TCE toxicity values which were updated by USEPA on September 29, 2011. This site-specific groundwater contract criterion (13,000 ug/L) is used in place of the generic Part 201 groundwater contact criterion for TCE (22,000 ug/L) in this Report. A calculation package describing the calculations used to determine the site-specific groundwater contact criterion for TCE was originally provided to USEPA with the September 2012 RI/EI Report. A copy of this calculation package is included as Appendix C.

Note that potential impacts to surface water and indoor air resulting from affected groundwater are considered separately in Sections 5 and 6.

4.2 Groundwater Data

Tables 4 through 7 provide all groundwater VOC data collected through June 2013. These tables are updated and re-submitted to USEPA on a regular basis as new data becomes available.

- The data included in Table 4 (source area grab groundwater sample data) was most recently updated and submitted to USEPA with the September 2012 RI/EI Report.
- The data included in Table 5 (compliance monitoring well data) was most recently updated and submitted to USEPA with the July 15, 2013, Second Quarter 2013 Progress Report.

- The data included in Table 6 (permeable reactive barrier performance monitoring locations) was most recently updated and submitted to USEPA in the September 2013 Second Annual Performance Monitoring Report.
- The data included in Table 7 (perimeter and off-site grab groundwater sample data) was most recently updated and submitted to USEPA with the September 2012 RI/EI Report.

4.3 Relevant Exposure Pathways

Exposure pathways were evaluated in the context of risk-based screening level exceedences. Exposure pathways are only relevant if the applicable screening levels for that pathway are exceeded, *e.g.*, the ingestion of groundwater migration pathway is relevant only if drinking water criteria are exceeded. Pathways that are not relevant are not considered further.

VOCs were detected in groundwater above Part 201 drinking water criteria. VOCs were not detected in groundwater above groundwater contact criteria. Exposure pathways were evaluated in the context of risk-based screening level exceedences:

- Exceedences of residential and non-residential DW criteria indicate that the ingestion of affected groundwater is a relevant pathway for groundwater. TPC evaluated the completeness of this pathway as described below.
- Groundwater contact criteria were not exceeded. Therefore **contact with affected groundwater is NOT a relevant exposure pathway.**

4.4 Evaluation of Drinking Water Pathway and Interim Corrective Measures

VOCs were detected in groundwater above screening levels for ingestion, but not above screening levels for contact. Therefore the ingestion of affected groundwater is the only relevant pathway for direct exposure to affected groundwater. (As noted above potential impacts to surface water and indoor air are considered separately).

As described in the Human Exposures EI Report, an intensive effort was made to evaluate, and mitigate where necessary, current human exposures to affected groundwater. Those investigation and mitigation activities include:

- A Declaration of Restrictive Covenant (RC) for the former TPC property which has been filed with the Lenawee County registers of deeds. This RC limits future property use to commercial/industrial use and prohibits the installation of wells, other than those required for groundwater monitoring purposes.
- A Public Water Supply Well Survey to verify that the public water supply had not been impacted by contaminated groundwater.

- A 2009 private well survey to identify wells within the area of affected groundwater, and subsequent sampling at those wells. The two wells which were identified with COC concentrations above DW criteria were subsequently decommissioned.
- Facilitation of the passage of a Groundwater Use Ordinance which was enacted by the City of Tecumseh in June 2011. The restricted area includes the area of affected groundwater, as well as a one block (minimum) buffer zone around the area of affected groundwater. Groundwater use is restricted as follows:
 - The installation, development, maintenance, and use of private water wells is prohibited;
 - Connection to the municipal water supply is required; and
 - Existing private water wells must be abandoned.
- In 2011 the private well survey area was expanded to identify all wells within the restricted area and facilitate compliance with the Groundwater Use Ordinance.

In December 2011, TPC met with property owners to confirm the presence/potential presence of a well at the properties identified as having a private well and to obtain permission to decommission those wells. Twelve wells were identified within the restricted area. Well decommissioning activities were completed in June 2012; all private wells within the restricted zone have been decommissioned. A letter report documenting well abandonment activities was sent to the City of Tecumseh in September 2012. A copy of this letter is included in Appendix D³.

4.5 USEPA Comments Regarding Groundwater Data

During a conference call on September 12, 2013, USEPA expressed concern that the increasing vinyl chloride concentration at monitoring well MW-23 could be indicative of the potential for groundwater to be affected in wells located north of East Chicago Boulevard, outside the area restricted by the Groundwater Use Ordinance (Figure 3).

Despite the late timing of this comment, TRC independently evaluated site conditions to determine if further investigation was warranted regarding current human exposure to groundwater via ingestion in the area north of East Chicago Boulevard.

Groundwater flow in the vicinity monitoring well MW-23, as illustrated on Figure 3, is east-northeast. The east-northeast component of flow in this area has been documented since submittal of the CCR in September 2009. These data indicate that affected groundwater in the

³ A copy of the letter report documenting well decommissioning activities was originally submitted to USEPA with the September 2012 RI/EI Report.

vicinity of monitoring well MW-23 vents to the River Raisin south of East Chicago Boulevard. However, as a precaution, TRC also conducted an electronic well survey. The survey area included the area from the corner of Maumee Street and East Chicago Boulevard north and east to the River Raisin, or its tributaries. This area is within the City of Tecumseh and has access to municipal water. A search of publicly available water well logs was conducted through the MDEQ website (Well Logic System and historical well logs database). There are no well logs for any of the properties located in this area.

TPC will continue groundwater monitoring and investigation activities, as appropriate, to verify the Groundwater EI demonstration in the area northeast of the site. However, both site hydrogeology (groundwater flow direction) and current site conditions (municipal water and no wells) support the Current Human Exposures Under Control Environmental Indicator Demonstration with regard to the ingestion of affected groundwater.

4.6 Potential Receptors

As described above, all wells within the area of affected groundwater, as well as a one block (minimum) buffer zone around that area, have been decommissioned. There are no current receptors for the ingestion of affected groundwater.

4.7 Current Human Exposure

VOCs were detected in groundwater above screening levels for ingestion, but not above screening levels for direct contact. Therefore the ingestion of affected groundwater is the only relevant pathway for groundwater. (Potential impacts to surface water and indoor air are considered separately). Current groundwater use by potential receptors: residents, workers, day-care facilities, and food were evaluated. **The ingestion of affected groundwater is not a complete migration pathway.** Therefore, current human exposure to affected groundwater remains under control.

Section 5

Indoor Air

5.1 Risk-Based Screening Levels for Indoor Air

The potential for volatilization to indoor air from multiple environmental media was assessed. Manufacturing operations at the former TPC site were discontinued in 2008, therefore no current on-site activities are a significant source to indoor air. COCs in soil and groundwater have the potential to volatilize and migrate into indoor air under certain conditions. Typically groundwater screening levels (GWSLs) and/or soil gas screening levels (SGSLs) for volatilization to indoor air are used to determine whether indoor air is potentially affected above risk-based screening criteria. These groundwater and soil gas screening levels are calculated by applying an attenuation factor to indoor air screening levels.

Vapor intrusion policy has been evolving and changing throughout the lifetime of this project. In 2009, USEPA published a report highlighting the fact that the lack of final guidance impedes efforts to address indoor air risks. As a follow-up to the review, USEPA conducted a review of its 2002 Draft Guidance. This review found that current guidance is lacking, particularly with respect to the evaluation of soil gas data. Final guidance from USEPA was scheduled for release in November 2012. USEPA has issued new draft guidance for review, but has not yet issued final guidance. In May 2013, MDEQ issued a final vapor intrusion guidance document.

During this period of uncertainty in state and federal policy, TPC has undertaken significant efforts to understand the current state of the science in this rapidly developing field, and has employed a combination of conservative risk assessment procedures and aggressive mitigation strategies to address the potential vapor intrusion migration pathway.

5.1.1 Current Regulation (unchanged since 2011)

On a federal level, the United States Department of Labor, Occupational Safety and Health Administration (OSHA) has published permissible exposure limits (PELs) for COCs in indoor air. OSHA PELs are only applicable for occupational exposures. USEPA has issued draft vapor intrusion guidance, but currently there are no federal regulations which specify risk-based screening levels for residential indoor air.

On a state level, Michigan does not have indoor air screening levels. Part 201 of the Michigan NREPA, as amended March 25, 2011, does provide residential and non-residential soil volatilization to indoor air inhalation criteria (SVIAIC) and groundwater volatilization to indoor air inhalation criteria (GVIAIC). However, the USEPA vapor intrusion guidance cautions against the use of soil sampling and analysis to assessing

whether or not the vapor intrusion pathway is complete, and few sites meet the requirements under which generic GVIAIC apply.

Given the limitations of current regulations regarding risk-based screening levels for vapor intrusion, state and federal vapor intrusion draft and final guidance documents were also used to assess the potential for vapor intrusion above risk-based screening criteria.

5.1.2 Vapor Intrusion Guidance

In September 2011, at the time the Human Exposures EI Report was submitted, current vapor intrusion guidance included:

- A **PEER REVIEW DRAFT** of RRD Operational Memorandum No. 4: Site Characterization and Remediation Verification: Attachment 4 – Soil Gas and Indoor Air (MDEQ Draft Guidance) dated June 2008.
- A MDEQ document titled Background Document: Draft Proposed Vapor Intrusion Indoor Air Criteria (IAC), Soil Gas Criteria (SGC), and Groundwater Screening Levels (GW_{vi}SLs) (MDEQ Background Document). Criteria and screening levels used in the September 2011 Human Exposures EI Report were calculated as described in the MDEQ Background Document.
- The OSWER **DRAFT** Guidance for Evaluating the Vapor Intrusion in Indoor Air Migration Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (2002 USEPA Draft Guidance) dated November 2002.

Since September 2011:

- In April 2013, USEPA issued an external review draft of the guidance document titled, “OSWER Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air.” In the header of each page document explicitly states, “*** EPA External Review Draft – Do Not Cite or Quote”.
- In May 2013, MDEQ issued a **final** guidance document titled, “Guidance Document for the Vapor Intrusion Pathway” (Final MDEQ VI Guidance).

5.1.3 Indoor Air Screening Levels

According to the 2002 USEPA Draft Guidance and USEPA clarification of guidance related to EI determinations (USEPA 2012b), OSHA will typically take the lead when assessing occupational exposure to affected or potentially affected indoor. OSHA has published PELs for the COCs. As documented in USEPA’s summary of the March 2012 project meeting (USEPA 2012a) and reiterated during the October 2012 project meeting (TRC 2012z), USEPA and TPC have confirmed that OSHA PELs can be used to evaluate current human exposures in non-residential settings. OSHA PELs, which assume

occupational exposure over an eight-hour period (time weighted average), are included in Table 8.

In addition to OSHA PELs, indoor air data are compared to the residential and non-residential indoor air screening levels (IASLs) provided in the May 2013 Final MDEQ VI Guidance. These IASLs replace residential and non-residential indoor air screening criteria which were calculated in accordance with the 2009 MDEQ Background Document and the 2002 USEPA Draft Guidance, using both residential and non-residential exposure scenarios and the most recent chemical specific toxicity values accepted and/or published by the USEPA at that time.

5.1.4 Groundwater Screening Levels

For this Supplement, residential and non-residential GWSLs were updated to reflect those provided in the Final MDEQ VI Guidance.

5.1.5 Soil Gas Screening Levels

For this Supplement, residential and non-residential SGSLs were updated to reflect those provided in the Final MDEQ VI Guidance.

5.2 On-Site Indoor Air

Given the elevated concentrations of COCs in on-site soil (Table 3), groundwater (Tables 4 and 5) and sub-slab soil gas (Table 9), indoor air samples were collected to evaluate risk directly. Indoor sample results are provided in Table 8 (Note: Samples dated February 2, 2010 were collected during a ventilation test. Sample conditions are not representative of current stagnant indoor air conditions).

5.2.1 Potential On-Site Receptors

- **Residents:** The site is not used for residential purposes. The inhalation of affected indoor air by on-site residents is **not a complete exposure pathway**.
- **Workers:** As described in Section 2.1, the site is currently occupied by the TFME site manager who works out of an office located in the old security area (S-Building), and several temporary and intermittent TFME employees who are in the process of scrapping the equipment TFME has stored on site. The inhalation of affected indoor air by on-site workers is a potentially complete migration pathway.

5.2.2 Current Human Exposures

No CVOCs are present at a concentration greater than 1 percent of their respective OSHA PELs. Therefore, in accordance with USEPA guidance, current human exposure to affected indoor air is acceptable for the purposes of the Current Human Exposures Demonstration.

Although CVOCs are below OSHA PELs in on-site indoor air, TPC elected to proactively address on-site exceedences of non-residential indoor air screening levels in the portions of the building (P-Building and S-Building) which are not targeted for demolition. Interim corrective measures are described in Section 5.5.

5.3 Off-Site Non-Residential Properties

Given the concentrations of COCs in perimeter and off-site groundwater above screening levels (Tables 5 and 7), a series of soil gas sample points were installed to further evaluate the potential for off-site vapor intrusion. Sample points were installed at locations to address those areas with highest potential risk, specifically near the site perimeter where concentrations are highest and in residential areas near the area of affected groundwater. In 2012, evidence of the lateral migration of affected soil gas from on-site prompted a widening of the investigation area and installation of additional soil gas sample points. All soil gas sample locations were selected based on collaborative discussions between USEPA and TPC.

5.3.1 Summary of Off-Site Soil Gas Data

Concentrations of COCs in perimeter and off-site soil gas are evaluated quarterly at 22 sample locations. Sample results through August 2013 are summarized in Table 10.⁴ Concentrations of CVOCs in soil gas collected at these locations were compared to non-residential SGSLS. Concentrations of COCs in soil gas have exceeded non-residential SGSLS at soil gas sample locations SG-01 and SG-02.

⁴ Soil gas data are tabulated, summarized, and evaluated on a regular basis. Soil gas data through June 2012 were included in the September 2012 RI/EI Report; an evaluation of data through November 2012 was submitted to USEPA with the Fourth Quarter 2012 Progress Report on January 15, 2013, and an evaluation of data through June 2013 was submitted to USEPA with the Second Quarter 2013 Progress Report on July 15, 2013.

5.3.2 Potential Off-Site Receptors at Non-Residential Properties

Residents

Off-site non-residential properties not used for residential purposes. The inhalation of affected indoor air by off-site residents is evaluated in Section 5.4 below.

Day Care Facilities

The State of Michigan licenses childcare providers, a list of licensed childcare providers is available via the Michigan Department of Health and Human Services website http://www.dleg.state.mi.us/brs_cdc/sr_lfl.asp. In 2012 evidence of lateral migration of affected soil gas from on-site prompted a widening of the investigation area. As documented in the April 15, 2012, First Quarter 2012 Progress Report, TRC reviewed the locations of licensed child care providers in the City of Tecumseh. The child care provider located nearest to the former TPC site is an in-home provider with a capacity of up to 6 children. This provider is located approximately 650 feet northwest of the former TPC site. No other childcare providers are located within 2,000 feet of the former TPC site.

There are no licensed childcare providers on-site or within the area of affected groundwater or within 650 feet of the area of affected groundwater. The inhalation of affected indoor air at day-care facilities is not a complete migration pathway.

Workers at Properties North/Northeast of the Site

Soil gas sample results for the area north/northeast of the site are below non-residential SGSLs. In fact, vinyl chloride, the only COC in this area that has been detected above GWSLs in shallow groundwater, has not been detected above SGSLs in any of the soil gas samples collected. The inhalation of affected indoor air by off-site workers is not a complete migration pathway north/northeast of the site.

Workers at Properties East of the Site

Soil gas sample results from soil gas sample locations along the southern half of the eastern perimeter of the site, SG-01 and SG-02, are above non-residential SGSLs. Non-residential properties east of the site may be affected by

volatilization to indoor air. The inhalation of affected indoor air by off-site workers is a potentially complete migration pathway.

5.3.3 Current Human Exposure to Affected Indoor Air at Off-Site Non-Residential Properties

As noted above, the inhalation of affected indoor air by off-site workers is a potentially complete migration pathway in the area east of the southern source area. Specifically, soil gas sample results from soil gas sample locations SG-01 and SG-02 are above non-residential SGSLs. MDEQ non-residential SGSLs were calculated from non-residential IASLs using a generic attenuation factor of 0.003. IASLs are much lower than OSHA PELs which are the applicable risk-based criteria for Current Human Exposures Under Control Demonstration. Soil gas concentrations at these locations are orders of magnitude below comparable SGSLs calculated using OSHA PELs. Therefore, **current exposure to affected indoor air by off-site workers is under control.** TPC has and continues to implement mitigation strategies to reduce the potential vapor intrusion pathway downgradient of the southern source area, including installation of a PRB as described in Section 5.5 and an ongoing evaluation of southern source and near source treatment options (workplan anticipated before the end of 2013).

5.4 Residential Properties

Given the elevated concentrations of COCs in perimeter and off-site groundwater (Tables 5 and 7), a series of soil gas sample points were installed to further evaluate the potential for off-site vapor intrusion. Sample points were installed at locations to address those areas with the highest potential risk, specifically near the site perimeter where concentrations are highest and in residential areas near the area of affected groundwater. In 2012, evidence of the potential for lateral migration of affected soil gas from the site prompted a widening of the investigation area and installation of additional soil gas sample points. All soil gas sample locations were selected based on collaborative discussions between USEPA and TPC.

5.4.1 Off-Site Soil Gas Data

Concentrations of COCs in perimeter and off-site soil gas are evaluated quarterly at 22 sample locations. Sample results through August 2013 are summarized in Table 10.⁵ Soil gas sample points SG-03/SG-03R, SG-04, SG-08, SG-09, SG-10, SG-11, SG-12/SG-12R,

⁵ Soil gas data are tabulated, summarized, and evaluated on a regular basis. Soil gas data through June 2012 were included in the September 2012 RI/EI Report; an evaluation of data through November 2012 was submitted to USEPA with the Fourth Quarter 2012 Progress Report on January 15, 2013, and an evaluation of data through June 2013 was submitted to USEPA with the Second Quarter 2013 Progress Report on July 15, 2013.

SG-13, SG-14R, SG-15/SG-15R, SG-16, SG-17, SG-18, SG-19, SG-20, and SG-21 are located in or near residential areas affected by the off-site migration of VOCs in groundwater (Figure 1). As such, soil gas concentrations at these locations were compared to residential SGSLS. Concentrations of COCs at residential soil gas sample locations have exceeded the residential SGSLS at soil gas sample locations SG-09 and SG-10.

5.4.2 Potential Off-Site Receptors at Residential Properties

Residents at Properties North of the Site

The following soil gas sample locations are near residential properties north of the site: SG-10, SG-11, SG-13, SG-16, SG-17, SG-18 and SG-19. In September 2011 revised TCE toxicity data were issued, and in early 2012, SGSLS were recalculated to in accordance with draft vapor intrusion guidance available at that time. TCE concentrations exceeded those SGSLS at several soil gas sample points located north of the site in areas where TCE has not been identified in groundwater.

A strategy for addressing those SGSLS exceedences was developed during a meeting with USEPA in March 2012. Specifically, TPC agreed to install a soil vapor extraction (SVE) system on-site to control the potential for off-site migration of TCE-affected soil gas from the site (further details provided in Section 5.5 below), to install additional soil gas sample points north and west of the site to further evaluate the nature and extent of TCE in soil gas, and to conduct two sample events to evaluate the effectiveness of the SVE system prior to December 12, 2012 (the extended deadline for the Human Exposures Under Control Extension at that time). During the October 2012 project meeting, Bhooma Sundar of USEPA indicated that she would prefer four sample events (beginning in the third quarter 2012) to verify the SVE system effectiveness. Consequently the deadline for the Human Exposures Under Control was extended again to accommodate that request.

Soil gas concentrations in residential areas north of the site have exceeded final MDEQ residential SGSLS at one location (SG-10), during one sample event (June 2012). Concentrations in residential area north of the site have been below SGSLS since the third quarter of 2012, indicating the SVE system has been effective in controlling lateral soil gas migration from the site to the north.

Residents at Properties West of the Site

As described above, evidence of the potential for lateral migration of affected soil gas from on-site prompted a widening of the investigation area and installation of additional soil gas sample points. In June 2012, soil gas sample points SG-20 and SG-21 were installed between the TPC site and residential areas west of the site. Concentrations of COCs have remained below residential SGSLs since that time. Therefore the inhalation of affected indoor air by off-site residents west of the site is not a complete migration pathway.

Residents at Properties Northeast of the Site

Prior to September 2011, the following soil gas sample locations were installed near residential properties northeast of the site: SG-12, SG-14, and SG-15. With the exception of one location, during one event (SG-12 in December 2010), water in the sample ports had prevented soil gas sample collection at these locations. No CVOCs were detected at soil gas sample location SG-12 in the December 2010 sample.

As documented in the September 2011 Human Exposures EI Report, water in the sample ports located northeast of the site is due to perched groundwater above an intermediate clay layer. The intermediate clay layer appears to be continuous east of Maumee Street and north of Patterson Street. Perched groundwater is consistently observed over this area. This perched groundwater and associated clay layer act as a barrier, impeding the migration of VOCs from affected groundwater (below the intermediate clay) to indoor air.

In addition, vinyl chloride is the only COC in the area northeast of the site that has been detected above GWSLs in shallow groundwater. Vinyl chloride has not been detected above SGSLs in any of the soil gas samples collected, including those along the northern perimeter of the site where vinyl chloride concentrations in shallow groundwater are highest.

Although the site setting makes vapor intrusion in this area improbable, TPC has undertaken significant effort since September 2011 to further verify and document the protectiveness of the intermediate clay layer and perched groundwater in this area. Those efforts are summarized in August 24, 2012 Technical Memorandum titled, *Subsurface Utility Maps, Clay Layer Evaluation, and 2nd Quarter 2012 Soil Gas*. These efforts included the installation of replacement soil gas sample points (SG-12R, SG-14R and SG-15R) in June 2012. Although water in the soil gas sample ports remains a challenge, TRC has

successfully collected multiple samples at all of these sample locations since the September 2011 Human Exposures EI Report was submitted. Since that time, 5 additional successful sample events have been completed at SG-12/SG-12R; seven successful sample events have been completed at SG-15/SG-15R, and two successful sample events have been completed at SG-14R. Note that although water has prevented sample collection during all but two sample events at SG-14R, the successful sample events at sample location SG-14R correspond to dry vadose zone conditions resulting from drought (June 2012) or a comparably low water table (August 2013). These dry vadose zone conditions represent a worst-case vapor intrusion potential, as evidenced by episodic concentration spikes at the other soil gas sample locations during the same sample events. Soil gas concentrations are below residential SGSLs at all locations northeast of the site. Therefore the inhalation of affected indoor air by off-site residents northeast of the site is not a complete migration pathway.

Residents at Properties East of the Site

Soil gas sample points SG-03/SG-03R, SG-04, SG-08 and SG-09 are located in the vicinity of residential properties east of the site. In September 2011, concentrations at soil gas sample locations SG-03 and SG-09 exceeded residential SGSLs calculated to in accordance with draft vapor intrusion guidance available at that time. Therefore the inhalation of affected indoor air by off-site residents east of the site was considered a potentially complete migration pathway meriting further evaluation. Note that soil gas concentrations in residential area east of the site have exceeded final MDEQ residential SGSLs only at soil gas sample point (SG-09).

5.4.3 Current Human Exposure to Affected Indoor Air by Off-Site Residents

As noted above, the inhalation of affected indoor air by off-site residents is a potentially complete migration pathway in the areas east and north of the site. As described below, mitigation and investigation activities completed since September 2011 have confirmed that current human exposures at residential properties are under control.

5.5 Interim Corrective Measures

5.5.1 Residential Properties East of the Site

Five residential properties are located in the vicinity of affected groundwater east of the site. In September 2011, TPC had obtained access agreements to install a sub-slab depressurization/ventilation (SSDV) system and/or conduct crawl space sampling at

these locations. SSDV system installation and crawlspace sampling was scheduled to be completed in October 2011. Given the limited duration of potential exposure following mitigation (and/or verification that mitigation was not needed), current human exposure to affected indoor air by residents along Mohawk Street was considered to be under control in September 2011. Mitigation and sampling activities have been completed as described below. No CVOCs were detected above IASLs at any of the sample locations.

Installation of a SSDV at the Residence located at 704 Mohawk Street East of Site

In October 2011, a SSDV system was installed at the residence located at 704 Mohawk Street. Installation and performance verification activities have been conducted as described in the Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: 704 Mohawk Street, dated May 2011 and revised September 2011. Pressure readings (collected during quarterly system inspections) show that the SDDV system has created a negative pressure gradient across the entire building footprint, indicating that the SSDV system has controlled the potential volatilization to indoor air migration pathway at 704 Mohawk Street. An exhaust sample and/or basement indoor air sample were collected in October 2011, November 2011, May 2012, and November 2012 to further verify system performance. Sample results are summarized in Tables E1 and E2 (Appendix E)⁶. Concentrations of COCs in indoor air have not been detected above residential IASLs. The volatilization to indoor air migration pathway has been controlled at 704 Mohawk Street. Regular system inspections are conducted verify that the SSDV system continues to operate as intended. **The SSDV system has controlled the volatilization to indoor air migration pathway at this property.**

Crawl Space Sampling at Residences East of Site

Four additional residential properties are located east of the site. In 2011, TRC conducted site inspections these properties (610 Mohawk Street, 502 Mohawk Street, 505 South Maumee, and 507 South Maumee Street) to support the design of a proposed SSDV system. Two significant features which affect the design, installation and functionality of a SSDV were observed:

- Houses at all four properties were constructed over a crawlspace with a dirt floor composed of low permeability soil (based on nearby soil boring data).

⁶ Sample data were provided to the property owner and USEPA in November 2011, December 2011, June 2012 and January 2013, as soon as feasible following the receipt of sample data from each sample event.

- At the three houses (502 Mohawk Street, 505 South Maumee, and 507 South Maumee Street), the crawl spaces frequently hold surface water, regularly flood during storm events, and likely have saturated conditions throughout the year.

Low permeability soils, particularly saturated low permeability soils, create a natural vapor barrier through which VOCs from do not readily migrate. Consequently, crawl space sampling was conducted to more directly assess the volatilization to indoor air migration pathway.

Crawl space samples were collected in October 2011, May 2012, and November 2012. Sample results are summarized in Tables E3 and E4 (Appendix E).⁷ Site-specific COCs have not been detected above residential indoor air screening levels in any of the samples collected. **The volatilization to indoor air migration pathway is not complete at these properties.**

5.5.2 Permeable Reactive Barrier

Based on the risk assessment provided above, current human exposure to affected indoor air at off-site properties east of the site is under control. However, TPC has also employed an aggressive groundwater mitigation strategy to address the potential vapor intrusion migration pathway. Concurrent with soil gas sampling activities, site inspections and the development of Workplans to install SSDV systems, long-term and potential future exposures to affected off-site indoor air east of the site were addressed through interim remedial actions.

In May 2011, TPC installed a permeable reactive barrier (PRB) along the eastern property boundary in the vicinity of soil gas sample locations SG-01, SG-02, and SG-03. The purpose of the PRB is to reduce the potential vapor intrusion pathway downgradient of the southern source area by treating shallow CVOC-affected groundwater along the eastern (downgradient) property line before it migrates off site. PRB design and construction is documented in the *Construction Documentation Report for the Permeable Reactive Barrier Downgradient of the Southern Source Area*, dated February 2012. The PRB performance monitoring network was installed in July and August 2011 in accordance with the *Workplan Addendum to Install Additional PRB Performance Monitoring Wells at the Former Tecumseh Products Site in Tecumseh, Michigan*. Quarterly groundwater monitoring was initiated in August 2011 in order to monitor the performance of the PRB. Since that time, PRB performance has been evaluated on an

⁷ Sample data were provided to the property owners and USEPA in November 2011, June 2012, and January 2013, as soon as feasible following the receipt of sample data from each sample event.

annual basis in the September 2012 *Performance Monitoring Report* and the September 2013 *Second Annual Performance Monitoring Report*. Lateral migration of affected soil gas may limit the apparent reduction in soil gas concentrations at perimeter sample locations. However, groundwater data indicate a significant reduction in the mass flux of TCE (84-percent) and 1,1,1-TCA (66-percent) across Maumee Street, located along the eastern perimeter of the site.

5.5.3 Installation of a SSDV at S-Building On-Site

In October 2011, a SSDV system was installed on-site at S-Building, which at that time was occupied by on-site security. S-Building is now occupied as office space by the TFME site manager. Installation and performance verification activities have been conducted as described in the Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: S-Building at 100 East Patterson Street, including collection of indoor air samples to verify system performance in October 2011 and February 2012. Sample results are summarized in Table F1 (Appendix F).⁸ Concentrations of COCs in indoor air have not been detected above non-residential IASLs. The volatilization to indoor air migration pathway has been controlled at S-Building.

5.5.4 Installation of an On-Site SVE System

On March 30, 2012, TRC began installation of the on-site SVE system. Pilot SVE system construction, as described in the April 2012 *Workplan to Conduct a Pilot Study to Facilitate the Design and Installation of a Full-Scale Soil Vapor Extraction System* (Pilot SVE Workplan), was completed on April 13, 2012. As described in the Pilot SVE Workplan, stepped-rate tests and system balancing were completed between April 16, 2012 and April 20, 2012. Constant rate operation of the pilot SVE system began on April 23, 2012. The pilot SVE system included four soil gas extraction points along the northern perimeter of P-Building (SVE-01 through SVE-04). Those points became part of the full-scale SVE system design (Line 1). Constant rate operation of the pilot system continued until the full-scale SVE system was installed. Field activities associated with the construction and operation of the pilot SVE system are described in more detail in the *Full-Scale Soil Vapor Extraction System Design and Installation Workplan* (Full-Scale SVE Workplan) dated May 2012.

On May 29, 2012, TRC began installation of the full-scale SVE system as described in the Full-Scale SVE Workplan. Construction of three additional extraction wells (SVE-05

⁸ Sample data were provided to the property owner and USEPA in February 2012 with the SSDV Construction Documentation Report and in May 2012.

through SVE-07) and associated SVE piping (Line 2) was completed on June 1, 2012. Stepped-rate tests and full-scale system start-up were completed between June 4, 2012 and June 5, 2012. As described in the Full-Scale SVE Workplan, operation of the full-scale SVE system was initiated using a rented SVE system blower capable of extracting approximately 500 cubic feet per minute (CFM). The permanent SVE blower skid was installed in October 2012. The permanent blower is capable of extracting approximately 700 CFM. Field activities associated with the construction and start-up of the full-scale SVE system are described in detail in the February 2013 *Full-Scale Soil Vapor Extraction System Construction Documentation Report*.

Exhaust samples were collected to evaluate system performance of both the pilot and full scale system. Exhaust concentrations increased substantially following the installation of Line 2, indicating that soil gas concentrations are higher in the vicinity of one or more of the Line 2 extraction wells (SVE-05 through SVE-07). Given the soil gas extraction rate of approximately 500 CFM, exhaust concentrations may be indicative of a sustained source in the vadose zone in the vicinity of one or more of the Line 2 extraction points (SVE-05 through SVE-07). Prior to SVE system installation, soil gas with high concentrations of COCs, particularly TCE, had the potential to migrate laterally outside the area of shallow affected groundwater. Exhaust sample results are summarized in Table F2 (Appendix F).

Note: The SVE system was operational prior to the collection of the second quarter 2012 soil gas sample event. However, due to the short period of operation, the SVE system is not expected to have much, if any effect on soil gas concentration at locations more than 100 feet from the nearest extraction well. The SVE system is designed to reduce off-site soil gas concentrations by reducing/eliminating additional off-site migration. The radius of vacuum influence does not extend to the residential areas north and west of the site. However, the source has been contained by the SVE system, and TCE concentrations to the north have remained below SGSLs for the last 5 soil gas sample events.

Section 6

Surface Water

6.1 Risk-Based Levels for Screening Levels for Surface Water

MDEQ Rule 57 Water Quality Values and generic Part 201 criteria for groundwater are the risk-based screening levels used to determine if surface water is or has the potential to be affected above human health-based risk levels⁹. Risk-based screening levels are listed below:

- Residential Part 201 Health-Based DW Criteria,
- Non-Residential Part 201 Health-Based DW Criteria,
- Rule 57 Non-Drinking Water Human Non-Cancer Value (HNV),
- Rule 57 Non-Drinking Water Human Cancer Value (HCV), and
- Part 201 Groundwater Contact (GC) Criteria.¹⁰

6.2 September 2011 Evaluation of Surface Water Data

There are no surface water bodies located on the former TPC site. The nearest surface water body is the River Raisin which is located approximately 1,500 to 2,500 feet downgradient of the site. The River Raisin and associated wetland area is a regional discharge feature. There are two potential mechanisms for VOCs migrating from the site to reach the River Raisin:

- The storm sewer along the perimeter of the site discharges at storm water sample location STW-01 (Figure 1) into the river basin; and
- The River Raisin is a regional discharge feature for the groundwater beneath the TPC site.

Storm water samples were collected and evaluated as described in the September 2011 Human Exposures EI Report. Based on this evaluation, surface water is not affected above risk-based screening levels due to storm water discharge.

Concentrations of VOCs are monitored in groundwater at monitoring wells located along the downgradient edge of the area of affected groundwater: MW-13s, MW-29s, MW-29d, MW-30s, MW-30d, MW-10s, MW-10d, MW-22, MW-17s, MW-31, MW-14s, and MW-14d (Table 5).

Concentrations of VOCs have been detected above DW criteria at two of these downgradient locations. The concentration of vinyl chloride has exceeded the DW criterion at monitoring well

⁹ This evaluation focuses solely on human exposure to affected surface water. Ecological risk is evaluated as part of the Groundwater Stability Environmental Indicators Determination.

¹⁰ As described in Section 4.1, a site-specific groundwater contact criterion was calculated for TCE (13,000 ug/L). Groundwater concentrations have not exceeded this site-specific groundwater contact criterion.

MW-22, and the concentration of TCE has exceeded the DW criterion at monitoring well MW-31.

Surface water concentrations are measured directly in the wetland area downgradient of monitoring well MW-22, at sample location WL-01. No VOCs have been detected at this location (Table 11).

As described in the Current Human Exposures EI Report, groundwater downgradient of monitoring well MW-31 may be discharging to the River Raisin at concentrations above risk-based levels for drinking water. However, concentrations in groundwater will be diluted by the river, resulting in concentrations in the river much less than the typical analytical detection limit for VOCs ($\ll 1.0$ ug/L). Therefore TRC concluded that **surface water is not affected above risk-based screening levels for current human exposure.**

6.3 USEPA Comments Regarding Surface Water Data

On December 5, 2011 in comment letter addressing the Human Exposures EI Report, Michelle Mullin at USEPA wrote:

I disagree that estimates for dilution are an acceptable method for ruling out human exposures at this pathway. As I have previously shared with Graham Crockford of TRC, a spring discharges to the River Raisin at the abandoned Blood Road Bridge, which is immediately downgradient of MW-31. It is common knowledge that some residents use this spring as a direct source of drinking water during their recreational activities, for example hunters fill up their water bottles from the spring. Therefore, TPC needs to re-evaluate its proposed remedy for VOC contamination observed at MW-31.

Despite the implications to the contrary, TRC had promptly addressed Ms. Mullin's concern, when it was first expressed. On December 19, 2011, TRC provided the following response to Ms. Mullin's continued concerns:

In a comment letter dated March 11, 2011, Ms. Mullin at USEPA noted that a "spring or artesian well that residents commonly drink from is located on the west bank of the River Raisin, on the north side of the old Blood Road Bridge." In April 2011, TRC communicated with a local resident for help locating the spring and conducted site reconnaissance to locate and identify the alleged spring. The Resident stated that persons may have drunk from the spring years ago, when he was a child, but that he was unaware of continued use. The results of site reconnaissance activities were reported in the Second Quarter 2011 Progress Report:

- *No well, fountain, or other devise to facilitate collection of seeping groundwater was identified.*
- *The groundwater seep was of insufficient volume to reasonably fill a water bottle or cupped hands directly.*

Considering the results of site reconnaissance, TPC supports the evaluation of current human exposure provided in Section 7 of the Current Human Exposures Under Control Report.

M. Mullin remained adamant that a sample was needed at the seep location during the March 2012 project meeting. Despite the lack of physical evidence to suggest that groundwater seep could reasonably be considered a drinking water source, TPC agreed to collect a surface water sample at the groundwater seep location (SEEP). No VOCs have been detected at this location (Table 11). These data confirm that **surface water is not affected above risk-based screening levels.**

Section 7

Outdoor Air

7.1 Risk-Based Screening Levels for Outdoor Air

Residential and non-residential IASLs were determined as described in Section 5.1 are also considered appropriate risk-based levels for outdoor air. These criteria are included in Table 8.

7.2 Background Ambient Air Concentrations

Measureable concentrations of VOCs, including the COCs for the site, are often present in background ambient air samples. Concentrations of CVOCs in background ambient air are expected to be similar to background indoor air concentrations. In June 2011, USEPA published a study which provided a summary of typical indoor air concentrations in North American residences. Background indoor air concentrations are also included in Table 8.

7.3 Evaluation of the Potential for Contamination in Outdoor Air

Prior to September 2011, concentrations of VOCs in outdoor ambient air had not been measured directly. However, indoor air concentrations were measured above the source areas. The highest measured indoor air concentration of TCE at the site was 19.8 ppbv, compared to a residential indoor air criterion of 0.37 ppbv. The highest detected concentration of 1,2-DCA in indoor air was 1.5 ppbv, compared to a residential indoor air criterion of 0.24 ppbv. Source area indoor air concentrations are expected to be diluted significantly as VOCs migrate outdoors. Therefore, TRC determined that **outdoor air is not expected to be affected above background ambient air concentrations and risk-based screening levels.**

USEPA has not indicated any concerns with the September 2011 evaluation of human exposure to outdoor air. However, in 2012, a SVE system was installed in the vicinity of the northern source area. During the March 2012 project meeting, USEPA did express concern that exhaust from the SVE system could have a negative impact on ambient air quality. Therefore, TRC collected an ambient air sample downwind of the SVE system exhaust following completion of the full-scale SVE system installation. As documented in the February 2013, *Full-Scale Soil Vapor Extraction System Construction Documentation Report*, no CVOCs were detected in the ambient air sample (Table 12).

Section 8

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Tables

Table 1
 Scenarios for Potential Human Exposure: On-Site
 Tecumseh Products Company
 Tecumseh, MI

Receptor Population	Exposure Medium	Exposure Route ⁽¹⁾	Relevant ⁽²⁾	Currently Under Control	Comments ⁽³⁾
All On-Site Receptors ⁽⁴⁾	Surface Soil	Dermal Contact and Ingestion	No	NA	COCs have not been detected in surface soils at concentrations above applicable Part 201 criteria.
	Subsurface Soil	Dermal Contact and Ingestion	No	NA	COCs have not been detected in surface soils at concentrations above applicable Part 201 criteria.
	Surface Water	Dermal Contact and Ingestion	No	NA	No ponds or other surface water bodies are present on site. Concentrations in surface soils are not expected to affect standing water due to significant storm events (<i>i.e.</i> mud puddles) above applicable Part 201 criteria.
	Groundwater	Ingestion	Yes	Yes	With the exception of monitoring wells, there are no wells on-site. A restrictive covenant on the property and a local groundwater use ordinance prohibit the installation of new potable wells.
	Ambient Air	Inhalation (Vapor Intrusion)	No	NA	COCs have not been detected in ambient air above applicable Part 201 criteria.
Routine Worker	Groundwater	Dermal Contact	Yes	Yes	Currently there are no routine workers. Under reasonable land use scenarios, routine workers will not have any job duties at would result in contact with groundwater.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. The site is inactive with no routine workers. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.
Trespassers	Groundwater	Dermal Contact	Yes	Yes	With the exception of monitoring wells, there are no wells on-site. Trespassers, if any, are unlikely to come into contact with groundwater, which is more than five feet below ground surface throughout the site.
	Indoor Air	Inhalation (Vapor Intrusion)	Yes	Yes	The developed portion of the facility is fenced to prevent trespassers. The restrictive covenant on the property requires that this control be maintained.

Notes:

NA: Not Applicable

1) Site constituents of concern are volatile organic compounds (VOCs). Only exposure pathways relevant to VOCs are considered.

2) Pathways are relevant only if one or more constituent of concern (COC) exceeds applicable screening criteria.

3) Additional detail can be found in the September 2012 Remedial Investigation and Groundwater Stabilized Environmental Indicator Report (RI Report) and the September 2013 Supplement to the Current Human Exposures Under Control Environmental Indicator Report (Supplement).

4) On-site receptors include routine workers, trespassers, the temporary site manager, construction/demolition workers, utility workers and environmental workers. Use of the property for residential and Type I commercial (e.g. daycare, retail store, church, etc.) use is prohibited by a restrictive covenant.

5) For non-residential vapor intrusion, indoor air concentrations were compared to OSHA PELs to evaluate current human exposures. At non-residential properties where COCs are not in use, non-residential indoor air screening levels will be considered when developing the final corrective measures proposal.

6) The temporary site manager (hired in November 2012) is the only person who currently occupies the site on a regular basis. He works out of an office located in S-Building where a vapor mitigation system was installed in October 2011. The duration of employment for the temporary site manager is expected to be less than 2 years.

7) COC concentrations in groundwater do NOT exceed Part 201 direct contact criteria. In January 2012, USEPA requested that the groundwater contact criterion for TCE be recalculated to reflect the September 2011 revised TCE toxicity values. Using MDEQ default assumptions (exposure frequency [EF] = 20 days per year and exposure duration [ED] = 21 years), the revised, generic groundwater contact criterion for TCE is 3,300 ug/L. Groundwater on-site, along the downgradient site perimeter, and downgradient of the southern source area may be affected at or above this concentration. Therefore a site-specific criterion (EF = 5 days per year and ED = 25 years) was calculated as described in Appendix C of the Supplement. Concentrations in groundwater do NOT exceed the site specific groundwater contact criterion for TCE.

Table 1
 Scenarios for Potential Human Exposure: On-Site
 Tecumseh Products Company
 Tecumseh, MI

Receptor Population	Exposure Medium	Exposure Route ⁽¹⁾	Relevant ⁽²⁾	Currently Under Control	Comments ⁽³⁾
Occasional/Short Duration Worker - Temporary Site Manager ⁽⁶⁾	Groundwater	Dermal Contact	Yes	Yes	With the exception of monitoring wells, there are no wells on-site. The temporary site manager has not been provided with a key for access to monitoring wells and has no known job duties which would result in contact with groundwater.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. The temporary site manager position is not expected to exist following the implementation of final corrective measures.
Occasional/Short Duration Worker - Construction/ Demolition Worker	Groundwater	Dermal Contact ⁽⁷⁾	Yes	Yes	The only planned construction/demolition work for the site is demolition of portions of the existing structure. The intention is to leave the slab intact. These demolition activities will not result in contact with groundwater. Future site development activities (particularly along the eastern perimeter of the site where depth to groundwater is less than 10 feet) could result in contact with affected groundwater. With the exception of TCE, groundwater concentrations are below generic groundwater contact criteria. TCE is below the calculated site specific groundwater contact criterion for TCE.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.
Occasional/Short Duration Worker - Utility Worker	Groundwater	Dermal Contact ⁽⁷⁾	Yes	Yes	The depth to groundwater below the existing building is more than fifteen feet. There are no known on-site utilities located below the water table. Future site development activities (particularly along the eastern perimeter of the site where depth to groundwater is less than 10 feet) could result in the installation of utilities below the water table. With the exception of TCE, groundwater concentrations are below generic groundwater contact criteria. TCE is below the calculated site specific groundwater contact criterion for TCE.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.
Occasional/Short Duration Worker - Environmental Worker	Groundwater	Dermal Contact	Yes	Yes	Environmental workers, particularly groundwater samplers, may encounter affected groundwater during job duties. Standard health and safety protocols include the use of gloves and other personnel protective gear to prevent and control exposure to groundwater.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.

Notes:

NA: Not Applicable

1) Site constituents of concern are volatile organic compounds (VOCs). Only exposure pathways relevant to VOCs are considered.

2) Pathways are relevant only if one or more constituent of concern (COC) exceeds applicable screening criteria.

3) Additional detail can be found in the September 2012 Remedial Investigation and Groundwater Stabilized Environmental Indicator Report (RI Report) and the September 2013 Supplement to the Current Human Exposures Under Control Environmental Indicator Report (Supplement).

4) On-site receptors include routine workers, trespassers, the temporary site manager, construction/demolition workers, utility workers and environmental workers. Use of the property for residential and Type I commercial (e.g. daycare, retail store, church, etc.) use is prohibited by a restrictive covenant.

5) For non-residential vapor intrusion, indoor air concentrations were compared to OSHA PELs to evaluate current human exposures. At non-residential properties where COCs are not in use, non-residential indoor air screening levels will be considered when developing the final corrective measures proposal.

6) The temporary site manager (hired in November 2012) is the only person who currently occupies the site on a regular basis. He works out of an office located in S-Building where a vapor mitigation system was installed in October 2011. The duration of employment for the temporary site manager is expected to be less than 2 years.

7) COC concentrations in groundwater do NOT exceed Part 201 direct contact criteria. In January 2012, USEPA requested that the groundwater contact criterion for TCE be recalculated to reflect the September 2011 revised TCE toxicity values. Using MDEQ default assumptions (exposure frequency [EF] = 20 days per year and exposure duration [ED] = 21 years), the revised, generic groundwater contact criterion for TCE is 3,300 ug/L. Groundwater on-site, along the downgradient site perimeter, and downgradient of the southern source area may be affected at or above this concentration. Therefore a site-specific criterion (EF = 5 days per year and ED = 25 years) was calculated as described in Appendix C of the Supplement. Concentrations in groundwater do NOT exceed the site specific groundwater contact criterion for TCE.

Table 2
 Scenarios for Potential Human Exposure: Off-Site
 Tecumseh Products Company
 Tecumseh, MI

Receptor Population	Exposure Medium	Exposure Route ⁽¹⁾	Relevant ⁽²⁾	Currently Under Control	Comments ⁽³⁾
All Off-Site Receptors ⁽⁴⁾	Surface Soil	Dermal Contact and Ingestion	No	NA	There is no mechanism for off-site soils to be affected above applicable Part 201 criteria.
	Subsurface Soil	Dermal Contact and Ingestion	No	NA	There is no mechanism for off-site soils to be affected above applicable Part 201 criteria.
	Surface Water	Ingestion	Yes	Yes	Groundwater at a monitoring well (MW-31) located upgradient of the River Raisin is affected above drinking water criteria. However, the River Raisin (locally and down river) is NOT a source for a public water supply, nor are those sources expected to change in the future.
		Dermal Contact	No	NA	There is no mechanism for off-site surface water to be affected above applicable Part 201 criteria.
	Groundwater	Ingestion	Yes	Yes	With the exception of monitoring wells, there are no wells within the area of affected groundwater. A local groundwater use ordinance prohibit the installation of new potable wells in the vicinity of affected groundwater.
	Ambient Air	Inhalation (Vapor Intrusion)	No	NA	COCs have not been detected in ambient air above applicable Part 201 criteria.
Resident	Groundwater	Dermal Contact	Yes	Yes	With the exception of monitoring wells there are no wells located within the area of affected groundwater. The depth to groundwater throughout this area is more than five feet below ground surface. Residents are not expected to have contact with groundwater under reasonable land use scenarios. Note: construction and utility work, which could be completed by residents on their own property is considered separately below.
	Indoor Air	Inhalation (Vapor Intrusion)	Yes	Yes	Vapor intrusion in residential areas is discussed in detail in the 2013 Supplement. East of the site a SSDV system has been installed at one of five residential properties. Crawl space sampling at the remaining four residential properties indicate that indoor air is not affected above residential indoor air screening levels. An on-site SVE system has been installed to control lateral migration from the northern source area to residential areas north and west of the site.
Local Business Employee	Groundwater	Dermal Contact	Yes	Yes	With the exception of monitoring wells there are no wells located within the area of affected groundwater. The depth to groundwater throughout this area is more than five feet below ground surface. Local employees are not expected to have contact with groundwater under reasonable land use scenarios.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.

Notes:

NA: Not Applicable

1) Site constituents of concern are volatile organic compounds (VOCs). Only exposure pathways relevant to VOCs are considered.

2) Pathways are relevant only if one or more constituent of concern (COC) exceeds applicable screening criteria.

3) Additional detail can be found in the September 2012 Remedial Investigation and Groundwater Stabilized Environmental Indicator Report (RI Report) and the September 2013 Supplement to the Current Human Exposures Under Control Environmental Indicator Report (Supplement).

4) Off-site receptors include residents, employees at local businesses, daycare facilities, construction/demolition workers, utility workers and environmental workers.

5) For non-residential vapor intrusion, indoor air concentrations were compared to OSHA PELs to evaluate current human exposures. At non-residential properties where COCs are not in use, non-residential indoor air screening levels will be considered when developing the final corrective measures proposal.

6) COC concentrations in groundwater do NOT exceed Part 201 direct contact criteria. In January 2012, USEPA requested that the groundwater contact criterion for TCE be recalculated to reflect the September 2011 revised TCE toxicity values. Using MDEQ default assumptions (exposure frequency [EF] = 20 days per year and exposure duration [ED] = 21 years), the revised, generic groundwater contact criterion for TCE is 3,300 ug/L. Groundwater on-site, along the downgradient site perimeter, and downgradient of the southern source area may be affected at or above this concentration. Therefore a site-specific criterion (EF = 5 days per year and ED = 25 years) was calculated as described in Appendix C of the Supplement. Concentrations in groundwater do NOT exceed the site specific groundwater contact criterion for TCE.

Table 2
 Scenarios for Potential Human Exposure: Off-Site
 Tecumseh Products Company
 Tecumseh, MI

Receptor Population	Exposure Medium	Exposure Route ⁽¹⁾	Relevant ⁽²⁾	Currently Under Control	Comments ⁽³⁾
Child Care	Groundwater	Dermal Contact	Yes	Yes	There are no licensed daycare facilities within the area of affected groundwater.
	Indoor Air	Inhalation (Vapor Intrusion)	Yes	Yes	There are no licensed daycare facilities in the vicinity of groundwater affected above groundwater screening levels for vapor intrusion. The nearest licensed child care provider is located approximately 600 feet northwest (upgradient/side gradient) of the site. This child care facility is an in-home provider licensed to care for up to six children. No other licensed child care facilities are located within 1000 feet of the site or the area of affected groundwater.
Occasional/Short Duration Worker - Construction/Demolition Worker	Groundwater	Dermal Contact ⁽⁶⁾	Yes	Yes	With the exception of TCE, groundwater concentrations are below generic groundwater contact criteria. TCE is below the calculated site specific groundwater contact criterion for TCE.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.
Occasional/Short Duration Worker - Utility Worker	Groundwater	Dermal Contact ⁽⁶⁾	Yes	Yes	With the exception of TCE, groundwater concentrations are below generic groundwater contact criteria. TCE is below the calculated site specific groundwater contact criterion for TCE.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.
Occasional/Short Duration Worker - Environmental Worker	Groundwater	Dermal Contact ⁽⁶⁾	Yes	Yes	Environmental workers, particularly groundwater samplers, may encounter affected groundwater during job duties. Standard health and safety protocols include the use of gloves and other personnel protective gear to prevent and control exposure to groundwater.
	Indoor Air	Inhalation (Vapor Intrusion) ⁽⁵⁾	Yes	Yes	COCs do not exceed OSHA PELs, but do exceed non-residential indoor air screening levels. Non-residential indoor air criteria will be considered when developing the final corrective measures proposal.

Notes:

NA: Not Applicable

1) Site constituents of concern are volatile organic compounds (VOCs). Only exposure pathways relevant to VOCs are considered.

2) Pathways are relevant only if one or more constituent of concern (COC) exceeds applicable screening criteria.

3) Additional detail can be found in the September 2012 Remedial Investigation and Groundwater Stabilized Environmental Indicator Report (RI Report) and the September 2013 Supplement to the Current Human Exposures Under Control Environmental Indicator Report (Supplement).

4) Off-site receptors include residents, employees at local businesses, daycare facilities, construction/demolition workers, utility workers and environmental workers.

5) For non-residential vapor intrusion, indoor air concentrations were compared to OSHA PELs to evaluate current human exposures. At non-residential properties where COCs are not in use, non-residential indoor air screening levels will be considered when developing the final corrective measures proposal.

6) COC concentrations in groundwater do NOT exceed Part 201 direct contact criteria. In January 2012, USEPA requested that the groundwater contact criterion for TCE be recalculated to reflect the September 2011 revised TCE toxicity values. Using MDEQ default assumptions (exposure frequency [EF] = 20 days per year and exposure duration [ED] = 21 years), the revised, generic groundwater contact criterion for TCE is 3,300 ug/L. Groundwater on-site, along the downgradient site perimeter, and downgradient of the southern source area may be affected at or above this concentration. Therefore a site-specific criterion (EF = 5 days per year and ED = 25 years) was calculated as described in Appendix C of the Supplement. Concentrations in groundwater do NOT exceed the site specific groundwater contact criterion for TCE.

Table 3
Summary of Detected Volatile Organic Compounds at On-Site Soil Sample Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	n-Butyl Benzene	sec-Butylbenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	4-Isopropyl-toluene	2-Methyl-naphthalene	Naphthalene	n-Propyl Benzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Tri-methylbenzene ⁽¹⁾	1,3,5-Tri-methylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes ⁽¹⁾	
DWP Criteria	1.6	1.6	1.4	2.0	1.5	NC	57	35	1.6	0.10	16	4.0	0.10	0.10	2.1	1.8	0.040	5.6	
GSIP Criteria	NC	NC	12	30 ⁽²⁾	0.36	NC	4.2	0.73	NC	1.2 ⁽²⁾	5.4	1.8	6.6 ⁽²⁾	4.0 ⁽²⁾	0.57	1.1	0.26 ⁽²⁾	0.82	
Residential DC Criteria	2,500	2,500	640	1,400	140	NC	8,100	16,000	2,500	88	250	460	180	500	110	94	3.8	150	
Non-Residential DC Criteria	8,000	8,000	640	1,400	140	NC	26,000	52,000	8,000	88	250	460	840	500	110	94	34	150	
Residential SVIAI Criteria	NC	NC	22	23	87	NC	2,700	250	NC	11	250	250	4.6	7.1	110	94	0.27	150	
Non-Residential SVIAI Criteria	NC	NC	41	43	140	NC	4,900	470	NC	60	250	460	24	37	110	94	2.8	150	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
GP-01 (3-5')	12/17/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.040	<0.15	
GP-03 (6-8')	12/17/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	0.26	<0.10	<0.10	<0.040	<0.15
GP-04 (4-6')	12/17/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.040	<0.15
GP-06 (3-5')	12/17/2008	<0.050	<0.050	0.15	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	4.3	<0.10	<0.10	<0.040	<0.15
GP-07 (2-4')	12/17/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	4.1	<0.10	<0.10	<0.040	<0.15
GP-09 (5-7')	12/17/2008	<0.050	<0.050	0.66	<0.050	0.092	--	<0.33	<0.33	0.077	0.12	<0.050	<0.050	3.2	<0.10	<0.10	<0.040	0.22	
GP-10 (2-4')	12/17/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	0.50	<0.10	<0.10	<0.040	<0.15
GP-12 (5-7')	12/17/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	0.35	<0.10	<0.10	<0.040	<0.15
GP-14 (1-3')	12/28/2008	0.16	<0.050	0.23	<0.050	0.17	--	<0.33	<0.33	0.30	5.9	0.31	3.8	<0.050	43	0.89	0.19	<0.040	1.5
GP-15 (3-5')	12/28/2008	<0.050	<0.050	1.3	<0.050	<0.050	--	1.1	1.8	<0.10	1.2	0.11	8.8	<0.050	38	0.22	<0.10	<0.040	0.93
GP-16 (1-3')	12/28/2008	<0.050	<0.050	0.41	<0.050	0.067	--	1.4	1.5	<0.10	3.3	0.078	<0.050	<0.050	7.6	<0.10	<0.10	<0.040	0.31
GP-17 (3-5')	12/28/2008	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	1.3	<0.10	<0.10	<0.040	<0.15
GP-21 (3-5')	1/19/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	0.075	<0.050	4.6	<0.050	1.6	<0.10	<0.10	<0.040	<0.15
GP-22 (8-10')	1/19/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	4.0	<0.050	5.2	<0.10	<0.10	<0.040	<0.15
GP-23 (3-5')	1/19/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	0.26	<0.050	1.7	<0.10	<0.10	<0.040	<0.15
GP-25 (1-2')	1/19/2009	<0.050	<0.050	3.4	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	8.6	<0.10	<0.10	<0.040	<0.15
GP-26 (3-5')	1/19/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050	<0.15
GP-27 (1-3')	1/19/2009	<0.050	<0.050	0.20	<0.050	0.064	--	--	--	<0.10	0.20	0.23	0.54	<0.050	4.5	<0.10	<0.10	<0.040	0.44
GP-28 (21-23')	1/19/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	0.23	<0.050	2.9	<0.050	0.94	<0.10	<0.10	<0.040	<0.15
GP-29 (3-5')	1/19/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.040	<0.15
HB-31 (0-0.5')	2/4/2009	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.33	<0.33	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050	<0.15
NS-01 (0-4')	4/17/2009	<0.039	--	<0.039	--	<0.039	--	--	0.48	<0.039	<0.039	<0.039	<0.039	<0.039	1.9	<0.039	<0.039	<0.039	--
NS-01 (16-20')	4/17/2009	<0.025	--	<0.025	--	<0.025	--	--	<0.25	<0.025	<0.025	<0.025	<0.025	<0.025	0.51	<0.025	<0.025	<0.025	--
NS-02 (0-4')	4/16/2009	<0.027	--	<0.027	<0.027	<0.027	--	--	<0.27	<0.027	<0.027	<0.027	<0.027	<0.027	0.35	<0.027	<0.027	<0.027	--
NS-02 (8-12')	4/16/2009	<0.027	--	<0.027	<0.027	<0.027	--	--	<0.27	<0.027	<0.027	<0.027	<0.027	<0.027	0.75	<0.027	<0.027	<0.027	--
NS-04 (8-12')	4/16/2009	<0.029	--	<0.029	<0.029	<0.029	--	--	<0.29	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	--
NS-05 (12-14')	4/20/2009	<0.033	--	0.058	<0.033	<0.033	--	--	<0.33	<0.033	0.040	<0.033	0.033	<0.033	4.5	<0.033	<0.033	<0.033	--
NS-06 (2-3')	4/20/2009	<0.026	--	9.6	0.23	0.14	--	--	0.31	0.43	0.51	0.082	<0.026	<0.026	5.2	4.0	1.4	0.14	--
NS-06 (23-24')	4/20/2009	<0.030	--	<0.030	<0.030	<0.030	--	--	<0.30	<0.030	<0.030	<0.030	<0.030	<0.030	0.52	<0.030	<0.030	<0.030	--
NS-07 (10-11')	4/21/2009	<0.029	--	<0.029	<0.029	<0.029	--	--	<0.29	<0.029	0.34	<0.029	<0.029	<0.029	1.5	<0.029	<0.029	<0.029	--
NS-08 (15-16')	4/21/2009	<0.063	--	<0.063	<0.063	<0.063	--	--	<0.63	<0.063	0.83	<0.063	<0.063	<0.063	4.3	<0.063	<0.063	<0.063	--
NS-09 (2-3')	4/21/2009	1.2	--	4.9	0.077	0.088	--	--	1.2	0.37	<0.030	0.086	<0.030	<0.030	0.31	5.4	1.9	0.48	--
NS-10 (8-9')	4/21/2009	9.1	--	0.88	<0.43	1.2	--	--	14	4.0	0.45	0.92	<0.43	<0.43	<0.43	34	9.7	<0.43	--
NS-10 (10-11')	4/21/2009	0.91	--	0.34	<0.027	0.11	--	--	1.5	0.36	0.028	0.090	<0.027	<0.027	0.061	3.1	0.98	0.072	--
NS-11 (0-4')	9/15/2010	<0.058	<0.058	<0.058	<0.058	<0.058	<0.12	<0.38	<0.38	<0.12	0.059	<0.12	<0.058	<0.058	0.77	<0.12	<0.12	<0.047	<0.18
NS-11 (22-23')	9/15/2010	<0.051	<0.051	<0.051	<0.051	<0.051	<0.10	<0.34	<0.34	<0.10	0.31	<0.10	<0.051	<0.051	4.1	<0.10	<0.10	<0.041	<0.15
NS-12 (0-2')	9/15/2010	0.15	0.10	<0.053	<0.053	<0.053	<0.11	<0.35	<0.35	<0.11	0.19	<0.11	<0.053	<0.053	0.88	<0.11	<0.11	<0.042	<0.16
NS-12 (22-24')	9/15/2010	<0.052	<0.052	<0.052	<0.052	<0.052	<0.10	<0.34	<0.34	<0.10	0.12	<0.10	<0.052	<0.052	2.0	<0.10	<0.10	<0.042	<0.15
NS-13 (0.5-4')	9/16/2010	<0.055	<0.055	<0.055	<0.055	<0.055	<0.11	<0.36	<0.36	<0.11	<0.055	<0.11	<0.055	<0.055	1.9	<0.11	<0.11	<0.044	<0.17
NS-13 (21-23')	9/16/2010	<0.14	<0.14	0.17	<0.14	<0.14	<0.28	<0.92	<0.92	<0.28	<0.14	<0.28	0.20	<0.14	17	<0.28	<0.28	<0.11	<0.42

Notes:

Drinking Water Protection (DWP) Criteria, Groundwater to Surface Water Interface Protection (GSIP) Criteria, Residential and Non-Residential Direct Contact (DC) Criteria and Residential and Non-Residential Soil Volatilization to Indoor Air Inhalation (SVIAI) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

mg/kg = milligrams per kilogram

NC = No Criteria

-- = Not Analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

Table 3
Summary of Detected Volatile Organic Compounds at On-Site Soil Sample Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	n-Butyl Benzene	sec-Butylbenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	4-Isopropyl-toluene	2-Methyl-naphthalene	Naphthalene	n-Propyl Benzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Tri-methylbenzene ⁽¹⁾	1,3,5-Tri-methylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes ⁽¹⁾	
DWP Criteria	1.6	1.6	1.4	2.0	1.5	NC	57	35	1.6	0.10	16	4.0	0.10	0.10	2.1	1.8	0.040	5.6	
GSIP Criteria	NC	NC	12	30 ⁽²⁾	0.36	NC	4.2	0.73	NC	1.2 ⁽²⁾	5.4	1.8	6.6 ⁽²⁾	4.0 ⁽²⁾	0.57	1.1	0.26 ⁽²⁾	0.82	
Residential DC Criteria	2,500	2,500	640	1,400	140	NC	8,100	16,000	2,500	88	250	460	180	500	110	94	3.8	150	
Non-Residential DC Criteria	8,000	8,000	640	1,400	140	NC	26,000	52,000	8,000	88	250	460	840	500	110	94	34	150	
Residential SVIAI Criteria	NC	NC	22	23	87	NC	2,700	250	NC	11	250	250	4.6	7.1	110	94	0.27	150	
Non-Residential SVIAI Criteria	NC	NC	41	43	140	NC	4,900	470	NC	60	250	460	24	37	110	94	2.8	150	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
NS-14 (0.5-3.5')	9/17/2010	<0.058	<0.058	<0.058	<0.058	<0.12	<0.38	<0.38	<0.12	<0.058	<0.12	0.063	<0.058	0.64	<0.12	<0.12	<0.047	<0.18	
NS-14 (22-23')	9/17/2010	<0.26	<0.26	<0.26	<0.26	<0.52	<1.7	<1.7	<0.52	<0.26	<0.52	2.3	<0.26	18	<0.52	<0.52	<0.21	<0.78	
NS-15 (2-4')	9/17/2010	1.4	1.1	6.7	<0.57	<0.57	<1.1	<3.7	<1.1	0.63	<1.1	<0.57	<0.57	72	<1.1	<1.1	<0.45	<1.7	
NS-15 (19-20')	9/17/2010	<0.10	<0.10	0.35	<0.10	<0.10	<0.21	<0.68	<0.21	0.13	<0.21	<0.10	<0.10	18	<0.21	<0.21	<0.083	<0.31	
NS-16 (2-4')	9/17/2010	<0.057	<0.057	<0.057	<0.057	<0.11	<0.38	<0.38	<0.11	<0.057	<0.11	<0.057	<0.057	1.7	<0.11	<0.11	<0.046	<0.17	
NS-16 (19-20')	9/17/2010	<0.26	<0.26	0.47	<0.26	<0.26	<0.52	<1.7	<0.52	<0.26	<0.52	<0.26	<0.26	33	<0.52	<0.52	<0.21	<0.78	
NS-17 (0.5-2.0')	9/17/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<2.1	<6.9	<2.1	<1.0	<2.1	<1.0	<1.0	100	<2.1	<2.1	<0.84	<3.1	
NS-17 (22-23')	9/17/2010	<0.052	<0.052	<0.052	<0.052	<0.10	<0.34	<0.34	<0.10	0.24	<0.10	0.23	<0.052	2.1	<0.10	<0.10	<0.041	<0.15	
NS-18 (20-25')	7/24/2012	<0.29	<0.29	0.45	<0.29	<0.29	<0.58	<1.9	<0.58	0.45	<0.58	0.37	<0.29	30	<0.58	<0.58	<0.23	<0.87	
NS-18 (30-35')	7/25/2012	<0.61	<0.61	1.9	<0.61	<0.61	<1.2	<4.1	<1.2	<0.61	<1.2	<0.61	<0.61	53	<1.2	<1.2	<0.49	<1.8	
NS-18 (40-43')	7/25/2012	<0.12	<0.12	4.2	0.55	<0.12	<0.24	<0.78	<0.24	<0.12	<0.24	<0.12	<0.12	11	<0.24	<0.24	<0.094	<0.36	
NS-19 (25-30')	7/26/2012	0.092	<0.060	0.17	<0.060	<0.060	<0.12	<0.39	<0.12	<0.060	<0.12	<0.060	<0.060	2.6	<0.12	<0.12	0.085	<0.18	
NS-19 (35-38')	7/26/2012	<0.32	<0.32	0.62	<0.32	<0.32	<0.63	<2.1	<0.63	<0.32	<0.63	<0.32	<0.32	45	<0.63	<0.63	<0.25	<0.95	
NS-19 (45-47')	7/26/2012	<0.058	<0.058	0.068	0.14	<0.058	<0.12	<0.38	<0.12	<0.058	<0.12	<0.058	<0.058	11	<0.12	<0.12	<0.047	<0.18	
NS-20 (23-28')	7/27/2012	<0.24	<0.24	<0.24	<0.24	<0.24	<0.49	<1.6	<0.49	0.38	<0.49	5.0	<0.24	26	<0.49	<0.49	<0.19	<0.73	
NS-20 (29-30')	7/27/2012	0.11	0.13	<0.059	<0.059	<0.059	<0.12	<0.39	<0.12	0.10	<0.12	<0.059	<0.059	0.43	<0.12	<0.12	0.55	<0.18	
NS-20 (35-40')	7/30/2012	<0.056	<0.056	<0.056	0.066	<0.056	<0.11	<0.37	<0.11	<0.056	<0.11	<0.056	<0.056	8.7	<0.11	<0.11	<0.045	<0.17	
MW-32S (0.5-1.5')	9/15/2010	<0.058	<0.058	<0.058	<0.058	<0.058	<0.12	<0.38	<0.12	<0.058	<0.12	0.092	<0.058	1.2	<0.12	<0.12	<0.046	--	
MW-32S (22-24')	9/15/2010	<0.23	<0.23	<0.23	<0.23	<0.23	<0.46	<1.5	<0.46	0.49	<0.46	1.8	<0.23	26	<0.46	<0.46	<0.18	--	
MW-33S (1-3')	9/15/2010	1.8	0.49	7.5	0.59	<0.053	0.53	4.5	2.6	0.53	0.82	<0.11	<0.053	0.30	5.7	3.9	1.2	0.41	--
MW-33S (19-22')	9/15/2010	<0.24	<0.24	<0.24	<0.24	<0.24	<0.49	<1.6	<0.49	0.47	<0.49	<0.24	<0.24	19	<0.49	<0.49	<0.20	--	
MW-34S (0.5-2.5')	9/16/2010	<0.049	<0.049	<0.049	<0.049	<0.049	<0.097	<0.32	<0.097	<0.049	<0.097	0.74	<0.049	1.2	<0.097	<0.097	<0.039	--	
MW-34S (21-23')	9/16/2010	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26	<0.85	<0.26	0.33	<0.26	9.6	<0.13	14	<0.26	<0.26	<0.10	--	
SS-1 (1.0-1.5')	4/15/2009	<0.032	--	<0.032	<0.032	<0.032	--	--	<0.032	<0.032	<0.032	0.84	<0.032	1.9	<0.032	<0.032	<0.032	--	
SS-2 (8-12')	4/16/2009	<0.029	--	<0.029	<0.029	<0.029	--	--	<0.029	0.069	<0.029	0.81	<0.029	0.97	<0.029	<0.029	<0.029	--	
SS-2 (16-20')	4/16/2009	<0.029	--	<0.029	<0.029	<0.029	--	--	<0.029	0.11	<0.029	1.3	<0.029	1.5	<0.029	<0.029	<0.029	--	
SS-3 (8-12')	4/16/2009	<0.030	--	<0.030	<0.030	<0.030	--	--	<0.030	1.1	<0.030	1.2	<0.030	0.90	<0.030	<0.030	<0.030	--	
SS-3 (16-20')	4/16/2009	<0.035	--	<0.035	<0.035	<0.035	--	--	<0.035	3.9	<0.035	3.5	<0.035	2.8	<0.035	<0.035	<0.035	--	
SS-4 (8-12')	4/17/2009	<0.12	--	<0.12	<0.12	<0.12	--	--	<0.12	0.49	<0.12	8.2	<0.12	4.4	<0.12	<0.12	<0.12	--	
SS-4 (12-16')	4/17/2009	<0.030	--	<0.030	<0.030	<0.030	--	--	<0.030	0.23	<0.030	3.5	<0.030	1.8	<0.030	<0.030	<0.030	--	
SS-5 (12-13')	4/17/2009	<0.030	--	<0.030	<0.030	<0.030	--	--	<0.030	0.13	<0.030	4.4	<0.030	3.3	<0.030	<0.030	<0.030	--	
SS-5 (20-21')	4/17/2009	<0.026	--	<0.026	<0.026	<0.026	--	--	<0.026	0.18	<0.026	7.7	<0.026	5.5	<0.026	<0.026	<0.026	--	
SS-5 (3-4')	4/17/2009	<0.13	--	<0.13	<0.13	<0.13	--	--	<0.13	0.24	<0.13	13	<0.13	11	<0.13	<0.13	<0.13	--	
SS-6 (5-7')	4/17/2009	<0.034	--	<0.034	<0.034	<0.034	--	--	<0.034	<0.034	<0.034	0.23	<0.034	0.12	<0.034	<0.034	<0.034	--	
SS-7 (21-22')	4/20/2009	<0.035	--	<0.035	<0.035	<0.035	--	--	<0.035	<0.035	<0.035	1.6	<0.035	5.0	<0.035	<0.035	<0.035	--	
SS-8 (19-20')	4/21/2009	<0.13	--	<0.13	<0.13	<0.13	--	--	<0.13	0.25	<0.13	7.3	<0.13	8.6	<0.13	<0.13	<0.13	--	
SS-9 (23-28')	7/31/2012	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26	<0.87	<0.26	0.65	<0.26	17	<0.13	13	<0.26	<0.26	<0.11	<0.39	
SS-9 (34-39')	7/31/2012	<0.055	<0.055	1.1	0.20	<0.055	<0.11	<0.36	<0.11	<0.055	<0.11	<0.055	<0.055	<0.055	<0.11	<0.11	<0.044	<0.17	
SS-9 (45-50')	7/31/2012	0.39	0.27	<0.049	<0.049	<0.049	<0.098	<0.32	<0.32	0.14	<0.049	<0.098	<0.049	0.38	0.23	<0.098	<0.039	<0.15	
SS-10 (22.5-27.5')	8/1/2012	<0.058	<0.058	<0.058	<0.058	<0.058	<0.12	<0.39	<0.39	<0.12	<0.058	<0.12	1.1	<0.058	<0.12	<0.047	<0.18		

Notes:
Drinking Water Protection (DWP) Criteria, Groundwater to Surface Water Interface Protection (GSIP) Criteria, Residential and Non-Residential Direct Contact (DC) Criteria and Residential and Non-Residential Soil Volatilization to Indoor Air Inhalation (SVIAI) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

mg/kg = milligrams per kilogram

NC = No Criteria

-- = Not Analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

Table 3
Summary of Detected Volatile Organic Compounds at On-Site Soil Sample Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	n-Butyl Benzene	sec-Butylbenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	4-Isopropyl-toluene	2-Methyl-naphthalene	Naphthalene	n-Propyl Benzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Tri-methylbenzene ⁽¹⁾	1,3,5-Tri-methylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes ⁽¹⁾	
DWP Criteria	1.6	1.6	1.4	2.0	1.5	NC	57	35	1.6	0.10	16	4.0	0.10	0.10	2.1	1.8	0.040	5.6	
GSIP Criteria	NC	NC	12	30 ⁽²⁾	0.36	NC	4.2	0.73	NC	1.2 ⁽²⁾	5.4	1.8	6.6 ⁽²⁾	4.0 ⁽²⁾	0.57	1.1	0.26 ⁽²⁾	0.82	
Residential DC Criteria	2,500	2,500	640	1,400	140	NC	8,100	16,000	2,500	88	250	460	180	500	110	94	3.8	150	
Non-Residential DC Criteria	8,000	8,000	640	1,400	140	NC	26,000	52,000	8,000	88	250	460	840	500	110	94	34	150	
Residential SVIAI Criteria	NC	NC	22	23	87	NC	2,700	250	NC	11	250	250	4.6	7.1	110	94	0.27	150	
Non-Residential SVIAI Criteria	NC	NC	41	43	140	NC	4,900	470	NC	60	250	460	24	37	110	94	2.8	150	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
SS-10 (30-35')	8/1/2012	<0.14	<0.14	<0.14	<0.14	<0.14	<0.27	<0.90	<0.90	<0.27	<0.14	<0.27	0.79	<0.14	16	<0.27	<0.27	<0.11	<0.41
SS-10 (50-55')	8/1/2012	<0.052	<0.052	0.29	<0.052	<0.052	<0.10	<0.34	<0.34	<0.10	<0.052	<0.10	<0.052	<0.052	<0.052	<0.10	<0.10	<0.042	<0.15
SVE-01 (3-5')	4/4/2012	<0.054	<0.054	<0.054	<0.054	<0.054	<0.11	<0.36	<0.36	<0.11	0.063	<0.11	<0.054	<0.054	0.16	<0.11	<0.11	<0.043	<0.16
SVE-01 (16-18')	4/4/2012	<0.059	<0.059	<0.059	<0.059	<0.059	<0.12	<0.39	<0.39	<0.12	0.20	<0.12	<0.059	<0.059	0.63	<0.12	<0.12	<0.047	<0.18
SVE-02 (4-6')	4/4/2012	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.33	<0.33	<0.10	0.10	<0.10	<0.050	<0.050	0.50	<0.10	<0.10	<0.040	<0.15
SVE-02 (16-18')	4/5/2012	<0.068	<0.068	<0.068	<0.068	<0.068	<0.14	<0.45	<0.45	<0.14	0.28	<0.14	<0.068	<0.068	1.5	<0.14	<0.14	<0.054	<0.21
SVE-03 (4-6')	4/3/2012	<0.057	<0.057	<0.057	<0.057	<0.057	<0.11	<0.37	<0.37	<0.11	<0.057	<0.11	<0.057	<0.057	0.62	<0.11	<0.11	<0.045	<0.17
SVE-03 (16-18')	4/4/2012	<0.052	<0.052	<0.052	<0.052	<0.052	<0.10	<0.35	<0.35	<0.10	<0.052	<0.10	<0.052	<0.052	0.96	<0.10	<0.10	<0.042	<0.15
SVE-04 (4-6')	4/3/2012	<0.10	<0.10	<0.10	<0.10	<0.10	<0.21	<0.68	<0.68	<0.21	<0.10	<0.21	<0.10	<0.10	0.58	<0.21	<0.21	<0.083	<0.31
SVE-04 (16-18')	4/3/2012	<0.061	<0.061	<0.061	<0.061	<0.061	<0.12	<0.40	<0.40	<0.12	<0.061	<0.12	<0.061	<0.061	1.7	<0.12	<0.12	<0.049	<0.18
B-58 (3-4')	4/1/2011	--	--	--	--	<0.059	--	--	--	--	<0.059	--	--	--	--	--	--	--	<0.18
B-58 (6-7')	4/1/2011	--	--	--	--	<0.055	--	--	--	--	<0.055	--	--	--	--	--	--	--	<0.17
B-59 (3-4')	4/1/2011	--	--	--	--	<0.057	--	--	--	--	<0.057	--	--	--	--	--	--	--	<0.17
B-59 (6-7')	4/1/2011	--	--	--	--	<0.055	--	--	--	--	<0.055	--	--	--	--	--	--	--	<0.16
B-60 (3-4')	4/1/2011	--	--	--	--	<0.057	--	--	--	--	<0.057	--	--	--	--	--	--	--	<0.17
B-60 (6-7')	4/1/2011	--	--	--	--	<0.054	--	--	--	--	<0.054	--	--	--	--	--	--	--	<0.16
B-61 (3-4')	4/1/2011	--	--	--	--	<0.056	--	--	--	--	<0.056	--	--	--	--	--	--	--	<0.17
B-61 (6-7')	4/1/2011	--	--	--	--	<0.049	--	--	--	--	0.18	--	--	--	--	--	--	--	0.43
B-62 (1-2')	4/1/2011	--	--	--	--	<0.049	--	--	--	--	0.14	--	--	--	--	--	--	--	<0.15
B-62 (3-4')	4/1/2011	--	--	--	--	<0.055	--	--	--	--	<0.055	--	--	--	--	--	--	--	<0.16
B-63 (3-4')	4/1/2011	--	--	--	--	<0.051	--	--	--	--	<0.051	--	--	--	--	--	--	--	<0.15
B-63 (6-7')	4/1/2011	--	--	--	--	<0.054	--	--	--	--	<0.054	--	--	--	--	--	--	--	<0.16

Notes:

Drinking Water Protection (DWP) Criteria, Groundwater to Surface Water Interface Protection (GSIP) Criteria, Residential and Non-Residential Direct Contact (DC) Criteria and Residential and Non-Residential Soil Volatilization to Indoor Air Inhalation (SVIAI) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

mg/kg = milligrams per kilogram

NC = No Criteria

-- = Not Analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

Table 4
Summary of Detected Volatile Organic Compounds at Source Area Grab Groundwater Sample Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	Benzene ⁽¹⁾	n-Butylbenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Naphthalene	n-Propylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene ⁽¹⁾	1,3,5-Trimethylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes
Health-Based Residential DW Criteria	5.0	80	430	80	880	7.0	70	100	700	520	80	5.0	1,000	200	5.0	5.0	1,000	1,000	2.0	10,000
Health-Based Non-Residential DW Criteria	5.0	230	1,700	80	2,500	7.0	70	100	700	1,500	230	5.0	1,000	200	5.0	5.0	2,900	2,900	2.0	10,000
Residential GWSL for Vapor Intrusion	27	91	44,000	140	4,300	370	83	360	700	240	92	94	36,000	17,000	96	10	1,700	1,200	2.8	10,000
Non-Residential GWSL for Vapor Intrusion	140	380	1.8E+05	720	18,000	1,600	350	1,500	2,600	1,200	390	460	1.5E+05	71,000	480	41	7,300	5,100	52	10,000
GSI Criteria	200 ⁽²⁾	NC	1,100 ⁽²⁾	350	740	130	620	1,500 ⁽²⁾	18	11	NC	60 ⁽²⁾	270	89	330 ⁽²⁾	200 ⁽²⁾	17	45	13 ⁽²⁾	41
Groundwater Contact Criteria	11,000	5,900	4.4E+05	1.5E+05	2.4E+06	11,000	2.0E+05	2.2E+05	1.7E+05	31,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽⁴⁾	56,000	61,000	1,000	1.90E+05
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft)	Benzene ⁽¹⁾	n-Butylbenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Naphthalene	n-Propylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene ⁽¹⁾	1,3,5-Trimethylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes
NS-01 (20-24')	4/17/2009	20.0	<20	<20	<100	<20	<20	<20	260	<20	<20	<100	<20	<20	<20	<20	<20	830	<20	<20	<20	<40
NS-02 (20-24')	4/17/2009	19.5	<50	<50	<250	<50	<50	<50	590	<50	<50	<250	<50	<50	<50	<50	<50	1,700	<50	<50	430	<100
NS-03 (16-20')	4/15/2009	16.0	<4.0	<4.0	<20	<4.0	<4.0	<4.0	23	<4.0	<4.0	<20	<4.0	<4.0	<4.0	<4.0	<4.0	45	<4.0	<4.0	41	<8.0
NS-03 (37-41')	4/15/2009	16.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	9.8	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	19	<1.0	<1.0	480	<2.0
NS-04 (14-18')	4/16/2009	14.0	<1.0	<1.0	<5.0	<1.0	1.4	<1.0	11	1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
NS-04 (32-36')	4/16/2009	14.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	5.9	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
NS-05 (20-24')	4/20/2009	21.0	<200	<200	<1,000	<200	<200	<200	<200	<200	<200	<1,000	<200	<200	<200	<200	<200	2,900	<200	<200	<200	<400
NS-06 (22-26')	4/20/2009	21.0	<100	<100	<500	<100	<100	<100	220	<100	<100	<500	<100	<100	<100	100	<100	4,500	<100	<100	<100	<200
NS-07 (20-24')	4/21/2009	22.0	<20	<20	<100	<20	<20	<20	34	<20	<20	<100	<20	30	<20	<20	<20	710	<20	<20	<20	<40
NS-08 (20-24')	4/21/2009	22.0	<20	<20	<100	<20	21	<20	100	<20	<20	<100	<20	28	<20	<20	<20	960	<20	<20	27	<40
NS-08 (20-24') DUP-09	4/21/2009	22.0	<20	<20	<100	<20	22	<20	100	<20	<20	<100	<20	29	<20	<20	<20	950	<20	<20	30	<40
NS-09 (20-24')	4/21/2009	21.0	<1.0	<1.0	5.8	1.1	46	<1.0	110	5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	16	1.3	<1.0	140	<2.0
NS-10 (21-25')	4/21/2009	21.0	<10	<10	<50	<10	26	<10	380	13	<10	<50	<10	<10	<10	<10	<10	<10	17	<10	45	<20
NS-11 (23-28')	9/15/2010	23.75	<10	<10	<50	<10	<10	<10	13	<10	<10	<50	<10	<10	<10	<10	15	<10	1,500	<10	<10	<30
NS-12 (23-28')	9/15/2010	24.0	<10	<10	<50	<10	31	14	330	<10	<10	<50	<10	<10	<10	<10	<10	720	<10	<10	120	<30
NS-13 (23-28')	9/16/2010	23.5	<10	<10	<50	<10	<10	<10	71	<10	<10	<50	<10	<10	<10	<10	13	<10	980	<10	<10	<30
NS-13 (23-28') DUP-02	9/16/2010	23.5	<1.0	<1.0	<50	<10	<10	<10	69	<10	<1.0	<5	<1.0	<10	<1.0	12	<1.0	970	<10	<1.0	<10	<2.0
NS-14 (23-28')	9/17/2010	23.75	<10	<10	<50	<10	28	<10	120	<10	<10	<50	<10	<10	<10	280	<10	1,300	<10	<10	<10	<30
NS-15 (22-27')	9/17/2010	22.0	<10	<10	<50	<10	57	<10	1,300	62	<10	<50	<10	<10	<10	<10	<10	87	<10	<10	660	<30
NS-16 (19-24')	9/17/2010	22.0	<5.0	<5.0	<25	<5.0	25	<5.0	150	6.2	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	530	<5.0	<5.0	210	<15
NS-17 (23-28')	9/17/2010	23.75	<1.0	<1.0	7.0	<1.0	19	<1.0	2.2	<1.0	<1.0	<5.0	<1.0	1.6	<1.0	35	<1.0	120	<1.0	<1.0	<1.0	<3.0
NS-18 (20-25')	7/25/2012	20.0	<10	<10	<50	<10	19	<10	58	<10	<10	<50	<10	<10	<10	11	<10	900	<10	<10	<10	<30
NS-18 (30-35')	7/25/2012	20.0	<25	<25	<120	<25	<25	<25	600	140	<25	<120	<25	<25	<25	<25	<25	2,600	<25	<25	26	<75
NS-18 (30-35') DUP-01	7/25/2012	20.0	<25	<25	<120	<25	<25	<25	610	140	<25	<120	<25	<25	<25	<25	<25	2,600	<25	<25	26	<75
NS-18 (39-44')	7/25/2012	20.0	<2.0	<2.0	<10	<2.0	<2.0	<2.0	200	30	<2.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	33	<2.0	<2.0	<2.0	<6.0
NS-19 (24-29')	7/27/2012	25.0	<10	<10	<50	<10	<10	<10	69	<10	<10	<50	<10	<10	<10	30	<10	900	<10	<10	53	<30
NS-19 (34-39')	7/27/2012	25.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	91	26	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	630	<5.0	<5.0	<5.0	<15
NS-19 (43.5-48.5')	7/27/2012	25.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	27	<1.0	<1.0	<1.0	<3.0
NS-20 (23-28')	7/31/2012	24.0	<25	<25	<120	<25	<25	<25	120	<25	<25	<120	<25	<25	<25	830	<25	2,600	<25	<25	<25	<75
NS-20 (29-34')	7/31/2012	24.0	<1.0	<1.0	<5.0	<1.0	22	2.3	17	1.5	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	18	<1.0	<1.0	130	<3.0
NS-20 (35-40')	7/31/2012	24.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	1.6	2.4	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	59	<1.0	<1.0	<1.0	<3.0

Notes:
Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.
Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.
ug/L = micrograms per liter
NC = No criteria
-- = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits
Green background denotes concentrations above one or more criteria

* An asterisk indicates that the observed depth to groundwater intersects or near an overlying clay unit that may act as a localized confining unit. The true piezometric surface may have a depth less than the recorded depth to groundwater.

- 1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 3) The approximate depth to groundwater is taken from soil boring logs. For sample locations with no soil boring log, approximate depth to groundwater is estimated using depth to groundwater data from nearby monitoring well and soil boring locations. Perched water, if present, is designated with a "p".
- 4) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 4
 Summary of Detected Volatile Organic Compounds at Source Area Grab Groundwater Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	Benzene ⁽¹⁾	n-Butylbenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Naphthalene	n-Propylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene ⁽¹⁾	1,3,5-Trimethylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes
Health-Based Residential DW Criteria	5.0	80	430	80	880	7.0	70	100	700	520	80	5.0	1,000	200	5.0	5.0	1,000	1,000	2.0	10,000
Health-Based Non-Residential DW Criteria	5.0	230	1,700	80	2,500	7.0	70	100	700	1,500	230	5.0	1,000	200	5.0	5.0	2,900	2,900	2.0	10,000
Residential GWSL for Vapor Intrusion	27	91	44,000	140	4,300	370	83	360	700	240	92	94	36,000	17,000	96	10	1,700	1,200	2.8	10,000
Non-Residential GWSL for Vapor Intrusion	140	380	1.8E+05	720	18,000	1,600	350	1,500	2,600	1,200	390	460	1.5E+05	71,000	480	41	7,300	5,100	52	10,000
GSI Criteria	200 ⁽²⁾	NC	1,100 ⁽²⁾	350	740	130	620	1,500 ⁽²⁾	18	11	NC	60 ⁽²⁾	270	89	330 ⁽²⁾	200 ⁽²⁾	17	45	13 ⁽²⁾	41
Groundwater Contact Criteria	11,000	5,900	4.4E+05	1.5E+05	2.4E+06	11,000	2.0E+05	2.2E+05	1.7E+05	31,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽⁴⁾	56,000	61,000	1,000	1.90E+05
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft)	Benzene ⁽¹⁾	n-Butylbenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Naphthalene	n-Propylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene ⁽¹⁾	1,3,5-Trimethylbenzene ⁽¹⁾	Vinyl Chloride	Total Xylenes
SS-1 (24-28')	4/15/2009	23.5	<200	<200	<1,000	<200	<200	<200	<200	<200	<200	<1,000	<200	<200	<200	1,500	<200	1,500	<200	<200	<200	<400
SS-1 (45-49')	4/15/2009	23.5	<1.0	<1.0	<5.0	<1.0	2.5	<1.0	9.9	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	2.7	<1.0	5.8	<1.0	<1.0	<1.0	<2.0
SS-2 (20-24')	4/16/2009	20.5	<100	<100	<500	<100	<100	<100	<100	<100	<100	<500	<100	<100	<100	2,200	<100	1,000	<100	<100	<100	<200
SS-2 (42-46')	4/16/2009	20.5	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	4.5	<1.0	5.3	<1.0	<1.0	<1.0	<2.0
SS-3 (20-24')	4/16/2009	19.75	<50	<50	<250	<50	<50	<50	<50	<50	<50	<250	<50	120	<50	600	<50	430	<50	<50	<50	<100
SS-4 (22-24')	4/17/2009	22.0	<100	<100	<500	<100	<100	<100	<100	<100	<100	<500	<100	<100	<100	2,500	<100	1,100	<100	<100	<100	<200
SS-5 (22-26')	4/17/2009	22.0	<100	<100	<500	<100	<100	<100	<100	<100	<100	<500	<100	<100	<100	2,200	<100	1,300	<100	<100	<100	<200
SS-6 (23-27')	4/17/2009	23.5	<200	<200	<1,000	<200	<200	<200	<200	<200	<200	<1,000	<200	<200	<200	2,600	<200	1,100	<200	<200	<200	<400
SS-7 (22-26')	4/20/2009	22.0	<100	<100	<500	<100	<100	<100	<100	<100	<100	<500	<100	<100	<100	1,300	<100	1,400	<100	<100	<100	<200
SS-8 (23-27')	4/21/2009	23.5	<100	<100	<500	<100	<100	<100	<100	<100	<100	<500	<100	<100	<100	4,100	<100	2,300	<100	<100	<100	<200
SS-9 (23-28')	8/2/2012	24.0	<10	<10	<50	<10	<10	<10	<10	<10	<10	<50	<10	11	<10	790	<10	560	<10	<10	<10	<30
SS-9 (34-39')	8/2/2012	24.0	<1.0	<1.0	<5.0	<1.0	8.0	<1.0	37	5.4	<1.0	<5.0	<1.0	<1.0	<1.0	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
SS-9 (45-50')	8/2/2012	24.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
SS-10 (22.5-27.5')	8/2/2012	23.5	<10	<10	<50	<10	<10	<10	<10	<10	<10	<50	<10	<10	<10	160	<10	770	<10	<10	<10	<30
SS-10 (33-38')	8/2/2012	23.5	<1.0	<1.0	<5.0	<1.0	8.2	<1.0	24	1.7	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	78	<1.0	<1.0	<1.0	<3.0
SS-10 (50-55')	8/3/2012	23.5	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	15	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0

Notes:
 Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.
 Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.
 ug/L = micrograms per liter
 NC = No criteria
 -- = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits
 Denotes concentrations above one or more criteria

- * An asterisk indicates that the observed depth to groundwater intersects or is near an overlying clay unit that may act as a localized confining unit. The true piezometric surface may have a depth less than the recorded depth to groundwater.
 1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
 2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
 3) The approximate depth to groundwater is taken from soil boring logs. For sample locations with no soil boring log, approximate depth to groundwater is estimated using depth to groundwater data from nearby monitoring well and soil boring locations. Perched water, if present, is designated with a "p".
 4) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-01s (16-21') Depth to Groundwater Approx. 16 - 19'	3/13/2009	<100	<100	<20	<20	<20	<20	750	<20	2,700	<20	<20
	4/20/2009	NA	<500	<100	<100	<100	<100	1,100	<100	2,200	NA	<100
	12/9/2009	<100	<100	<20	<20	<20	<20	1,000	<20	3,400	<20	<20
	3/17/2010	<100	<100	<20	<20	<20	<20	1,400	<20	2,500	<20	<20
	5/18/2010	<100	<100	<20	<20	<20	<20	1,000	<20	2,700	<20	<20
	9/10/2010	<100	<100	<20	<20	<20	<20	750	<20	2,400	<20	<20
	12/28/2010	<100	<100	<20	<20	<20	<20	1,100	<20	2,500	<20	<20
	2/25/2011	<50	<50	<10	<10	<10	<10	560	<10	1,300	<10	<10
	5/11/2011 ⁽⁴⁾	<50	<50	<10	<10	<10	<10	860	<10	1,900	<10	<10
	7/28/2011	<100	<100	<20	<20	<20	<20	500	<20	1,900	<20	<20
	10/6/2011	<100	<100	<20	<20	<20	<20	540	<20	2,000	<20	<20
	1/9/2012	<100	<100	<20	<20	31	<20	530	<20	2,000	<20	<20
	4/4/2012	<100	<100	<20	<20	38	<20	480	<20	1,900	<20	<20
	7/11/2012	<100	<100	<20	<20	<20	<20	560	<20	2,100	<20	<20
10/8/2012	<100	<100	<20	<20	<20	<20	650	<20	2,000	<20	<20	
6/11/2013	<100	<100	<20	<20	<20	<20	470	<20	1,400	<20	<20	
DUP-01 (MW-01s)	3/13/2009	<20	<20	<20	<20	<20	<20	720	<20	2,700	<20	<20
MW-02s (23-28') Depth to Groundwater Approx. 22 - 24'	3/13/2009	<10	<10	<2.0	<2.0	2.4	<2.0	2.2	<2.0	2.5	<2.0	<2.0
	4/20/2009	NA	<50	<10	<10	<10	<10	<10	<10	130	NA	<10
	12/9/2009	<10	<10	<2.0	<2.0	3.7	<2.0	2.7	<2.0	2.9	<2.0	<2.0
	3/17/2010	13	<10	<2.0	<2.0	4.1	<2.0	2.3	<2.0	3.1	<2.0	<2.0
	5/18/2010	<10	<10	<2.0	<2.0	2.3	<2.0	2.4	<2.0	2.6	<2.0	<2.0
	9/10/2010	<10	<10	<2.0	<2.0	2.3	<2.0	2.3	<2.0	2.20	<2.0	<2.0
	12/22/2010	<10	<10	<2.0	<2.0	2.4	<2.0	2.3	<2.0	2.40	<2.0	<2.0
	2/24/2011	<10	<10	<2.0	<2.0	2.0	<2.0	2.6	<2.0	2.40	<2.0	<2.0
	5/10/2011 ⁽⁴⁾	<10	<10	<2.0	<2.0	<2.0	<2.0	2.3	<2.0	2.50	<2.0	<2.0
	7/28/2011 ⁽⁵⁾	<10	<10	<2.0	<2.0	2.0	<2.0	2.2	<2.0	2.40	<2.0	<2.0
	10/7/2011	<10	<10	<2.0	<2.0	<2.0	<2.0	2.5	<2.0	2.20	<2.0	<2.0
	1/10/2012	<10	<10	<2.0	<2.0	<2.0	<2.0	2.8	<2.0	1.90	<2.0	<2.0
	4/5/2012	<10	<10	<2.0	<2.0	2.7	<2.0	3.5	<2.0	2.10	<2.0	<2.0
	7/11/2012	<10	<10	<2.0	<2.0	2.2	<2.0	2.5	<2.0	3.30	<2.0	<2.0
10/25/2012	<10	<10	<2.0	<2.0	<2.0	<2.0	2.6	<2.0	2.70	<2.0	<2.0	
6/11/2013	<10	<10	<2.0	<2.0	<2.0	<2.0	2.8	<2.0	3.00	<2.0	<2.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride	
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0	
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0	
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾	
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8	
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52	
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
MW-03s (9-14') Depth to Groundwater Approx. 8 - 10'	3/13/2009	<10	<10	9.1	<2.0	240	9.1	<2.0	<2.0	<2.0	<2.0	140	
	4/20/2009	NA	<50	18	<10	490	18	<10	<10	<10	NA	210	
	12/8/2009	<120	<120	46	<25	2,200	83	<25	<25	<25	<25	130	
	3/17/2010	<25	<25	11	<5.0	460	17	<5.0	<5.0	<5.0	<5.0	42	
	5/18/2010	<25	<25	14	<5.0	630	24	<5.0	<5.0	<5.0	<5.0	34	
	9/10/2010	<50	<50	29	<10	1,600	63	<10	<10	<10	<10	83	
	12/22/2010	<50	<50	32	<10	1,800	82	<10	<10	<10	<10	70	
	2/25/2011	<100	<100	33	<20	2,200	110	<20	<20	<20	<20	<20	75
	5/10/2011 ⁽⁴⁾	<100	<100	25	<20	1,600	77	<20	<20	<20	<20	<20	52
	7/28/2011	<100	<100	23	<20	1,700	78	<20	<20	<20	<20	<20	65
	10/6/2011	<100	<100	24	<20	2,100	100	<20	<20	<20	<20	<20	91
	1/10/2012	<50	<50	22	<10	1,300	81	<10	<10	<10	<10	<10	51
	4/4/2012	<100	<100	<20	<20	1,600	84	<20	<20	<20	20	<20	170
7/11/2012	<100	<100	23	<20	2,500	120	<20	<20	<20	25	<20	210	
10/8/2012	<100	<100	<20	<20	1,700	93	<20	<20	<20	<20	<20	100	
6/3/2013	<100	<100	24	<20	2,000	120	<20	<20	<20	<20	<20	220	
DUP-01 (MW-03s)	12/8/2009	<120	<120	42	<25	2,000	73	<25	<25	<25	<25	120	
MW-04s (15-20') Depth to Groundwater Approx. 15 - 17'	3/13/2009	<120	<120	<25	<25	2,100	70	<25	<25	<25	5,000	<25	460
	4/20/2009	NA	<500	<100	<100	1,700	<100	<100	<100	<100	4,000	NA	520
	12/9/2009	<250	<250	<50	<50	2,500	90	<50	<50	<50	7,100	<50	270
	3/17/2010	<250	<250	<50	<50	2,900	82	<50	<50	<50	7,500	<50	520
	5/18/2010	<250	<250	<50	<50	2,100	58	<50	<50	<50	4,700	<50	280
	9/17/2010	<250	<250	<50	<50	2,400	70	<50	<50	<50	5,200	<50	200
	12/22/2010	<250	<250	<50	<50	2,700	91	<50	<50	<50	6,700	<50	270
	2/25/2011	<250	<250	<50	<50	2,500	82	<50	<50	<50	5,900	<50	280
	5/11/2011 ⁽⁴⁾	<250	<250	<50	<50	1,900	58	<50	<50	<50	4,600	<50	270
	7/28/2011	<250	<250	<50	<50	1,700	50	<50	<50	<50	4,600	<50	190
	10/6/2011	<250	<250	<50	<50	2,000	58	<50	<50	<50	4,600	<50	190
	1/10/2012	<250	<250	<50	<50	1,800	72	<50	<50	<50	4,800	<50	190
	4/4/2012	<250	<250	<50	<50	1,600	54	<50	<50	<50	4,300	<50	170
7/11/2012	<250	<250	<50	<50	2,100	65	<50	<50	<50	5,600	<50	200	
10/8/2012	<250	<250	<50	<50	2,200	66	<50	<50	<50	6,700	<50	200	
6/3/2013	<250	<250	<50	<50	1,900	63	<50	<50	<50	5,700	<50	140	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Light Green Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion		4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion		1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-04i (21.5-26.5') Depth to Groundwater Approx. 16-17'	4/3/2013	<250	<250	<50	<50	3,100	100	<50	<50	<50	5,000	<50	53
	6/3/2013	<250	<250	<50	<50	3,400	96	<50	<50	<50	4,900	<50	53
MW-05s (25-30') Depth to Groundwater Approx. 25 - 27'	3/13/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	3.5	<1.0	<1.0	120	<1.0	<1.0
	4/20/2009	NA	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	140	NA	<5.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	5.3	<1.0	<1.0	190	<1.0	<1.0
	3/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	6.3	<1.0	<1.0	160	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	4.6	<1.0	<1.0	160	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	4.6	<1.0	<1.0	140	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	4.9	<1.0	<1.0	160	<1.0	<1.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	4.4	<1.0	<1.0	130	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	4.9	<1.0	<1.0	160	<1.0	<1.0
	7/27/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	4.8	<1.0	<1.0	150	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	5.1	<1.0	<1.0	150	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	5.8	<1.0	<1.0	150	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	5.7	<1.0	<1.0	160	<1.0	<1.0
7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	5.8	<1.0	<1.0	160	<1.0	<1.0	
10/25/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	3.8	<1.0	<1.0	130	<1.0	<1.0	
MW-06s (24-29') Depth to Groundwater Approx. 23 - 26'	3/16/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	21	<1.0	<1.0
	4/20/2009	NA	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	23	NA	<1.0
	12/9/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	37	<1.0	<1.0
	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	31	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	33	<1.0	<1.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	29	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	34	<1.0	<1.0
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	35	<1.0	<1.0
	5/10/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	27	<1.0	<1.0
	7/27/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	27	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	30	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	31	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	32	<1.0	<1.0
7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	32	<1.0	<1.0	
10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	28	<1.0	<1.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

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ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-07s (23.5-28.5') Depth to Groundwater Approx. 24 - 26'	3/16/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	10	<1.0	<1.0
	4/20/2009	NA	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	11	NA	<1.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	14	<1.0	<1.0
	3/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	13	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	13	<1.0	<1.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	12	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	16	<1.0	<1.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	12	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	12	<1.0	<1.0
	7/27/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	11	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	13	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	14	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	12	<1.0	<1.0
7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	14	<1.0	<1.0	
10/19/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	14	<1.0	<1.0	
MW-08s (23.5-28.5') Depth to Groundwater 23 - 26'	3/16/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<1.0	<1.0
	4/20/2009	NA	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10	NA	<1.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<1.0	<1.0
DUP-01 (MW-08s)	4/20/2009	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10	NA	<1.0
MW-08d (40-45') Depth to Groundwater Approx. 26 - 27'	4/2/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	6/11/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-01 (MW-08d)	4/2/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-09s (7-12') Depth to Groundwater* Approx. 5 - 8'	3/16/2009	<100	<100	<20	<20	<20	<20	160	<20	1,700	<20	<20
	4/20/2009	NA	<500	<100	<100	<100	<100	220	<100	2,100	NA	<100
	12/9/2009	<100	<100	<20	<20	<20	<20	150	<20	2,400	<20	<20
	3/18/2010	<100	<100	<20	<20	<20	<20	120	<20	1,500	<20	<20
	5/18/2010	<100	<100	<20	<20	<20	<20	120	<20	1,700	<20	<20
	9/17/2010	<100	<100	<20	<20	<20	<20	120	<20	1,700	<20	<20
	2/25/2011	<50	<50	<10	<10	<10	<10	84	<10	1,100	<10	<10
5/11/2011 ⁽⁴⁾	<50	<50	<10	<10	<10	<10	83	<10	1,200	<10	<10	

Notes:

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Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.

5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.

6) Headspace present in the sample, results are approximate.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-10s (8-13') Depth to Groundwater Approx. 7 - 9'	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/9/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DUP-02 (MW-10s)	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-10d (14-19') Depth to Groundwater Approx. 9 -10'	12/9/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-11s (29-34') Depth to Groundwater Approx. 29 - 32'	5/14/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/13/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/12/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DUP-02 (MW-11s)	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DUP-01 (MW-11s)	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

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- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
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Table 5
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Tecumseh, Michigan

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Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-12s (12-17') Depth to Groundwater Approx. 13 - 15'	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0
	12/30/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	2.2	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
	10/12/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5/30/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-12d (33-38') Depth to Groundwater Approx. 13 - 15'	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/12/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/31/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
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Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-13s (13-18') Depth to Groundwater Approx. 15 - 17'	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/12/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/31/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-14s (4-9') Depth to Perched Groundwater Approx. 3 - 7'	5/14/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/11/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.

5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.

6) Headspace present in the sample, results are approximate.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-14d (37.5-42.5') Depth to Groundwater Approx. 30 - 31'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-01 (MW-14d)	7/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-02 (MW-14d)	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-15s (30-35') Depth to Groundwater Approx. 30 - 32'	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/30/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

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- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-17s (3-8') Depth to Groundwater Approx. 6'	7/23/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/7/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/11/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-18s (26-31') Depth to Groundwater Approx. 25 - 27'	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

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Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
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Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-19s (25-30') Depth to Groundwater Approx. 24 - 26'	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	31	<1.0	<1.0
	1/13/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	2.3	<1.0	36	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.7	<1.0	36	<1.0
	5/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	32	<1.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	1.8	<1.0	33	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	37	<1.0
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.8	<1.0	41	<1.0
	5/10/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	28	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.0	1.4	<1.0	27	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.7	<1.0	28	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	1.9	<1.0	34	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.5	<1.0	32	<1.0
	7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	2.3	<1.0	32	<1.0
10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	31	<1.0	
DUP-03 (MW-19s)	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.0	1.7	<1.0	32	<1.0
DUP-02 (MW-19s)	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.8	<1.0	39	<1.0
	5/10/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	29	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.4	<1.0	27	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.6	<1.0	28	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.2	1.8	<1.0	34	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.1	1.6	<1.0	32	<1.0
	7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.6	2.3	<1.0	32	<1.0
10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	27	<1.0	

Notes:

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Bold font denotes concentrations detected above laboratory reporting limits

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- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride	
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0	
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0	
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾	
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8	
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52	
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
MW-19d (40-45') Depth to Groundwater Approx. 24 - 26'	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	5/10/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DUP-01 (MW-19d)	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-20s (8-13') Depth to Groundwater* Approx. 4 - 6'	12/30/2009	<5.0	<5.0	48	4.0	9.6	<1.0	<1.0	150	<1.0	71	2.9	
	1/13/2010	<5.0	<5.0	50	3.5	9.0	<1.0	<1.0	170	<1.0	70	2.8	
	3/17/2010	<5.0	<5.0	51	3.8	9.4	<1.0	<1.0	160	<1.0	64	3.2	
	5/18/2010	<10	<10	58	5.1	12	<2.0	<2.0	210	<2.0	94	3.4	
	9/10/2010	<10	<10	34	4.2	9.7	<2.0	<2.0	230	<2.0	110	3.8	
	12/21/2010	<10	<10	24	3.6	6.1	<2.0	<2.0	200	<2.0	89	3.6	
	2/18/2011	<10	<10	19	3.3	5.5	<2.0	<2.0	190	<2.0	93	3.5	
	5/13/2011	<10	<10	14	2.8	4.1	<2.0	<2.0	190	<2.0	91	2.9	
	7/25/2011	<10	<10	6.5	<2.0	2.4	<2.0	<2.0	190	<2.0	100	2.3	
	10/10/2011	<10	<10	5.8	<2.0	<2.0	<2.0	<2.0	190	<2.0	110	3.1	
	1/9/2012	<5.0	<5.0	6.0	1.4	1.9	<1.0	<1.0	190	<1.0	100	3.2	
	4/9/2012	<5.0	<5.0	11	1.1	2.0	<1.0	<1.0	180	<1.0	100	2.6	
	7/10/2012	<10	<10	17	<2.0	2.5	<2.0	<2.0	190	<2.0	100	2.3	
10/19/2012	<10	<10	24	<2.0	3.8	<2.0	<2.0	190	<2.0	98	2.0		
5/31/2013	<10	<10	18	2.6	6.7	<2.0	<2.0	240	<2.0	120	2.0		

Notes:

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Bold font denotes concentrations detected above laboratory reporting limits

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- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
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- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
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Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride	
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0	
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0	
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾	
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8	
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52	
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
MW-20d (38.5-43.5') Depth to Groundwater Approx. 12 - 16'	12/30/2009	<5.0	<5.0	1.2	<1.0	86	<1.0	<1.0	1.9	<1.0	<1.0	<1.0	3.5
	1/13/2010	<5.0	<5.0	<1.0	<1.0	94	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7
	3/17/2010	<5.0	<5.0	<1.0	<1.0	85	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.4
	5/18/2010	<5.0	<5.0	<1.0	<1.0	120	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7
	9/10/2010	<5.0	<5.0	<1.0	<1.0	95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	200	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.5
	2/18/2011	<10	<10	<2.0	<2.0	190	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.2
	5/13/2011	<10	<10	<2.0	<2.0	170	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.6
	7/25/2011	<5.0	<5.0	<1.0	<1.0	170	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.6
	10/10/2011	<10	<10	<2.0	<2.0	200	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.5
	1/9/2012	<5.0	<5.0	<1.0	<1.0	140	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	190	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	10
	7/10/2012	<10	<10	<2.0	<2.0	230	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	14
10/19/2012	<10	<10	<2.0	<2.0	180	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	43	
6/3/2013	<10	<10	<2.0	<2.0	250	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	67	
DUP-03 (MW-20d)	5/18/2010	<5.0	<5.0	<1.0	<1.0	120	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7
MW-21 (28.5-33.5') Depth to Groundwater Approx. 29 - 30'	12/8/2009	<50	<50	31	<10	59	<10	<10	54	<10	840	<10	<10
	1/13/2010	<50	<50	28	<10	62	<10	<10	56	<10	730	<10	<10
	3/23/2010	<5.0	<5.0	33	2.2	81	7.5	<1.0	62	<1.0	850	<1.0	<1.0
	5/18/2010	<50	<50	35	<10	89	<10	<10	63	<10	830	<10	<10
	10/15/2010	<50	<50	26	<10	80	<10	<10	59	<10	810	<10	<10
	12/22/2010	<50	<50	25	<10	69	<10	<10	55	<10	730	<10	<10
	2/24/2011	<50	<50	25	<10	66	<10	<10	52	<10	730	<10	<10
	5/11/2011 ⁽⁴⁾	<50	<50	24	<10	65	<10	<10	49	<10	740	<10	<10
	7/28/2011	<50	<50	22	<10	77	<10	<10	54	<10	1,000	<10	<10
	10/6/2011	<50	<50	22	<10	74	<10	<10	55	<10	960	<10	<10
	1/10/2012	<50	<50	27	<10	79	<10	<10	64	<10	990	<10	<10
	4/4/2012	<50	<50	25	<10	81	<10	<10	55	<10	980	<10	<10
	7/11/2012	58	<50	25	<10	85	<10	<10	63	<10	1,000	<10	<10
10/8/2012	<50	<50	22	<10	65	<10	<10	47	<10	850	<10	<10	
3/6/2013	<50	<50	26	<10	90	<10	<10	50	<10	760	<10	<10	
6/11/2013	<50	<50	26	<10	100	<10	<10	60	<10	1,100	<10	<10	
DUP-02 (MW-21)	3/23/2010	<5.0	<5.0	33	2.2	79	7.8	<1.0	61	<1.0	810	<1.0	<1.0

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Bold font denotes concentrations detected above laboratory reporting limits

Green background denotes concentrations above one or more criteria

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Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
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Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
DUP-03 (MW-21)	2/24/2011	<50	<50	24	<10	66	<10	<10	50	<10	740	<10
	5/11/2011 ⁽⁴⁾	<50	<50	24	<10	66	<10	<10	49	<10	750	<10
	7/28/2011	<50	<50	23	<10	78	<10	<10	57	<10	1,000	<10
	10/6/2011	<50	<50	21	<10	73	<10	<10	52	<10	910	<10
	1/10/2012	<50	<50	27	<10	85	<10	<10	66	<10	1,000	<10
	4/4/2012	<50	<50	24	<10	81	<10	<10	61	<10	970	<10
	7/11/2012	<50	<50	25	<10	80	<10	<10	59	<10	1,000	<10
6/11/2013	<50	<50	26	<10	110	<10	<10	76	<10	1,100	<10	
MW-22 (25-30') Depth to Groundwater Approx. 25 - 26'	12/7/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8.5
	5/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.3
	12/22/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.3
	5/11/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.8
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.2
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8.4
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12
	7/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	13
	10/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	18
5/29/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	21	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

740 Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride	
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0	
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0	
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾	
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8	
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52	
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
MW-23 (17-22') Depth to Groundwater* Approx. 8 - 10'	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	
	1/13/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.6	
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.0	
	5/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.1	
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.0	
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	17	
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	18	
	5/10/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	25
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	23
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	56
	11/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	48
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	85
7/10/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	63	
10/8/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	47	
5/31/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	88	
MW-24s (18.5'-23.5') Depth to Groundwater Approx. 19 - 21'	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	7/19/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	7/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	10/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/29/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

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- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
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Tecumseh, Michigan

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Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-24d (39-44') Depth to Groundwater Approx. 19 - 21'	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/19/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/30/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-25s (20-25') Depth to Groundwater Approx. 18 - 20'	12/10/2009	<5.0	<5.0	1.7	<1.0	8.8	<1.0	<1.0	4.8	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	1.2	<1.0	<1.0	<1.0	<1.0	17	<1.0	1.1	<1.0
	5/14/2010	<5.0	<5.0	1.2	<1.0	<1.0	<1.0	<1.0	18	<1.0	1.0	<1.0
	9/8/2010	<5.0	<5.0	1.0	<1.0	<1.0	<1.0	<1.0	19	<1.0	1.4	<1.0
	12/22/2010	<5.0	<5.0	1.2	<1.0	<1.0	<1.0	<1.0	26	<1.0	2.4	<1.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	19	<1.0	2.2	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	21	<1.0	2.2	<1.0
	7/28/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	19	<1.0	2.5	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	20	<1.0	2.8	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	20	<1.0	3.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	20	<1.0	3.6	<1.0
	7/11/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	21	<1.0	4.2	<1.0
10/25/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	19	<1.0	4.6	<1.0	
6/3/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	19	<1.0	6.1	<1.0	
DUP-01 (MW-25s)	3/16/2010	<5.0	<5.0	1.3	<1.0	<1.0	<1.0	<1.0	18	<1.0	1.0	<1.0

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Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
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Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-26s (28-33') Depth to Groundwater Approx. 26 - 28'	4/6/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-27s (7-12') Depth to Groundwater* Approx. 3 - 4'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DUP-02 (MW-27s)	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

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ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-27d (37.5-42.5') Depth to Groundwater Approx. 24 - 25'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011 ⁽⁴⁾	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-28s (25-30') Depth to Groundwater Approx. 25 - 27'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/12/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

Notes:

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Bold font denotes concentrations detected above laboratory reporting limits

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- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
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Table 5
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Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-28d (49-54') Depth to Groundwater Approx. 25 - 27'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/19/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
DUP-03 (MW-28d)	10/19/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-29s (13-18') Depth to Groundwater Approx. 15 - 16'	3/18/2010	<5.0	<5.0	<1.0	<1.0	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/15/2010	<5.0	<5.0	<1.0	<1.0	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/12/2012	<5.0	<5.0	<1.0	<1.0	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/30/2013	<5.0	<5.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

Notes:

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Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
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Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-29d (58.5-63.5') Depth to Groundwater* Approx. 18 - 19'	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/19/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/30/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-30s (11-16') Depth to Groundwater* Approx. 9 - 11'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/19/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/30/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for Trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-30d (25.5-30.5') Depth to Groundwater* Approx. 9 - 11'	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/19/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
5/30/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-31 (33.3-38.3') Depth to Groundwater Approx. 32 - 33'	6/18/2010	<5.0	<5.0	14	<1.0	19	2.2	<1.0	20	<1.0	180	<1.0
	9/17/2010	<10	<10	<2.0	<2.0	15	<2.0	<2.0	48	<2.0	220	<2.0
	12/22/2010 ⁽⁵⁾	<10	<10	16	<2.0	29	2.9	<2.0	27	<2.0	260	<2.0
	2/24/2011	<10	<10	16	<2.0	31	3.1	<2.0	26	<2.0	300	<2.0
	5/11/2011 ⁽⁴⁾	<10	<10	15	<2.0	24	3.0	<2.0	22	<2.0	250	<2.0
	7/21/2011	<5.0	<5.0	7.4	<1.0	14	1.2	<1.0	11	<1.0	130	<1.0
	10/4/2011	<5.0	<5.0	18	<1.0	40	3.4	<1.0	28	<1.0	340	<1.0
	1/10/2012	<10	<10	17	<2.0	35	3.1	<2.0	24	<2.0	290	<2.0
	4/5/2012	<10	<10	16	<2.0	36	3.1	<2.0	24	<2.0	290	<2.0
	7/17/2012	<20	<20	16	<4.0	34	<4.0	<4.0	23	<4.0	310	<4.0
10/3/2012	16	<12	15	<2.5	40	3.4	<2.5	26	<2.5	340	<2.5	
3/6/2013	<12	<12	13	<2.5	32	2.9	<2.5	23	<2.5	270	<2.5	
5/29/2013	<12	<12	15	<2.5	39	2.9	<2.5	23	<2.5	300	<2.5	
DUP-01 (MW-31)	6/18/2010	<5.0	<5.0	12	<1.0	19	2.3	<1.0	21	<1.0	170	<1.0

Notes:

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Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

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- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
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- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
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- 6) Headspace present in the sample, results are approximate.

Table 5
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Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria	13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria	38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria	2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion	4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion	1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria	2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-32s (23-28*) Depth to Groundwater Approx. 23 - 25'	9/17/2010	<100	<100	150	<20	270	26	<20	220	<20	2,400	<20
	11/18/2010	<100	<100	<20	<20	190	<20	<20	560	<20	2,800	<20
	12/28/2010	<100	<100	<20	<20	200	<20	<20	510	<20	2,300	<20
	2/25/2011	<100	<100	<20	<20	190	<20	<20	420	<20	2,300	<20
	5/10/2011 ⁽⁴⁾	<100	<100	<20	<20	170	<20	<20	380	<20	2,300	31
	7/28/2011	<100	<100	<20	<20	140	<20	<20	380	<20	2,400	<20
	10/6/2011	<100	<100	<20	<20	160	<20	<20	350	<20	2,200	<20
	1/10/2012	<100	<100	<20	<20	170	<20	<20	400	<20	2,300	<20
	4/4/2012	<100	<100	<20	<20	130	<20	<20	340	<20	2,200	<20
	7/11/2012	<100	<100	<20	<20	85	<20	<20	370	<20	2,200	<20
10/10/2012	<100	<100	<20	<20	89	<20	<20	280	<20	1,600	<20	
5/20/2013	<100	<100	<20	<20	89	<20	<20	220	<20	1,400	<20	
MW-32d (35-40*) Depth to Groundwater Approx. 23 - 24'	5/20/2013	<5.0	<5.0	<1.0	<1.0	2.0	3.2	<1.0	<1.0	<1.0	53	<1.0
MW-33s (21-26*) Depth to Groundwater Approx. 20 - 22'	9/17/2010	<5.0	<5.0	12	<1.0	13	<1.0	<1.0	<1.0	<1.0	76	<1.0
	11/18/2010	<5.0	<5.0	14	<1.0	22	<1.0	<1.0	1.1	<1.0	150	<1.0
	12/22/2010	<5.0	<5.0	14	<1.0	22	1.2	<1.0	1.0	<1.0	130	<1.0
	2/24/2011	<5.0	<5.0	12	<1.0	20	1.0	<1.0	<1.0	<1.0	110	<1.0
	5/10/2011 ⁽⁴⁾	<10	<10	11	<2.0	21	<2.0	<2.0	<2.0	<2.0	220	<2.0
	7/28/2011	<10	<10	8.9	<2.0	18	<2.0	<2.0	<2.0	<2.0	260	<2.0
	10/6/2011	<10	<10	11	<2.0	19	<2.0	<2.0	<2.0	<2.0	220	<2.0
	1/9/2012 ⁽⁶⁾	<5.0	8.9	15	<1.0	20	1.0	<1.0	1.3	<1.0	170	<1.0
	4/4/2012	<5.0	5.6	17	<1.0	21	<1.0	<1.0	1.2	<1.0	170	<1.0
	7/11/2012	<5.0	13	25	<1.0	32	1.3	<1.0	<1.0	<1.0	130	<1.0
10/10/2012	<5.0	12	23	<1.0	31	1.2	<1.0	<1.0	<1.0	120	<1.0	
5/20/2013	<5.0	9.4	16	<1.0	23	<1.0	<1.0	<1.0	<1.0	98	<1.0	
DUP-01 (MW-33s)	11/18/2010	<5.0	<5.0	14	<1.0	23	<1.0	<1.0	1.2	<1.0	150	<1.0

Notes:

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- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
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Tecumseh, Michigan

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Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion		4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion		1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-34s (23-28') Depth to Groundwater Approx. 23 - 25'	9/17/2010	<100	<100	<20	<20	<20	<20	<20	1,600	<20	1,100	<20	<20
	11/18/2010	<100	<100	<20	<20	<20	<20	<20	1,600	<20	1,200	<20	<20
	12/28/2010	<50	<50	<10	13	<10	<10	<10	1,400	<10	1,000	<10	<10
	2/25/2011	<50	<50	<10	<10	<10	<10	<10	1,100	<10	900	<10	<10
	5/10/2011 ⁽⁴⁾	<50	<50	<10	<10	<10	<10	<10	1,200	<10	970	<10	<10
	7/28/2011	<50	<50	<10	<10	<10	<10	<10	1,300	<10	1,100	<10	<10
	10/6/2011	<50	<50	<10	<10	<10	<10	<10	1,200	<10	1,000	<10	<10
	1/10/2012	<50	<50	<10	14	<10	<10	<10	1,500	<10	1,100	<10	<10
	4/4/2012	<50	<50	<10	<10	<10	<10	<10	1,400	<10	1,200	<10	<10
	7/11/2012	<50	<50	<10	<10	<10	<10	<10	1,400	<10	1,100	<10	<10
10/10/2012	<50	<50	<10	<10	<10	<10	<10	1,400	<10	1,100	<10	<10	
5/20/2013	<50	<50	<10	<10	<10	<10	<10	720	<10	730	<10	<10	
DUP-01 (MW-34s)	5/20/2013	<50	<50	<10	<10	<10	<10	<10	730	<10	730	<10	<10
MW-34d (45-50') Depth to Groundwater Approx. 23 - 24'	5/20/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-35i (20.5-22.5') Depth to Groundwater Approx. 16 - 17'	10/29/2012	<250	<250	<50	94	<50	<50	<50	4,500	<50	3,000	<50	<50
	3/27/2013	<250	<250	<50	110	<50	<50	<50	4,500	<50	2,700	<50	<50
	6/5/2013	<250	<250	<50	160	<50	<50	<50	6,400	<50	4,300	<50	<50
MW-35d (42.5-44.5') Depth to Groundwater Approx. 15 - 16'	7/24/2012	<5.0	<5.0	<1.0	<1.0	180	53	<1.0	1.5	<1.0	20	<1.0	22
	10/25/2012	<5.0	<5.0	<1.0	<1.0	3.8	1.2	<1.0	<1.0	<1.0	2.2	<1.0	19
	3/6/2013	<5.0	<5.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	24
	6/11/2013	<5.0	<5.0	<1.0	<1.0	2.3	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	23
MW-36s (16.5-21.5') Depth to Groundwater Approx. 16 - 17'	4/3/2013	<12	19	15	2.7	140	18	<2.5	35	2.9	260	<2.5	12
	5/31/2013	<12	20	14	2.6	150	18	<2.5	29	<2.5	280	<2.5	11
MW-36d (31-36') Depth to Groundwater Approx. 16 - 17'	4/2/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	6/11/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-37s (25.5-30.5') Depth to Groundwater Approx. 25 - 26'	4/3/2013	<25	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	570	<5.0	<5.0
	6/3/2013	<25	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	580	<5.0	<5.0
MW-38s (9-14') Depth to Groundwater Approx. 9 - 10'	4/3/2013	<10	<10	13	<2.0	22	2.7	<2.0	18	<2.0	210	<2.0	16
	6/3/2013	<10	<10	15	<2.0	30	2.6	<2.0	18	<2.0	230	<2.0	16
MW-38d (29-34') Depth to Groundwater Approx. 30 - 32'	4/3/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<1.0	<1.0
	6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	<1.0

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 5
 Summary of Detected Volatile Organic Compounds at Compliance Monitoring Well Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500 ⁽¹⁾	60 ⁽¹⁾	89	330 ⁽¹⁾	200 ⁽¹⁾	NC	13 ⁽¹⁾
Residential GWSLs for Vapor Intrusion		4.3E+06	44,000	4,300	370	83	360	94	17,000	96	10	28,000	2.8
Non-Residential GWSLs for Vapor Intrusion		1.8E+07	1.8E+05	18,000	1,600	350	1,500	460	71,000	480	41	1.2E+05	52
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	21,000	13,000 ⁽³⁾	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-39s (15.5-20.5')	4/3/2013	<50	<50	86	17	56	<10	<10	86	<10	810	<10	<10
Depth to Groundwater Approx. 15 - 16'	6/3/2013	<50	<50	90	18	71	<10	<10	84	<10	870	<10	<10
MW-39d (34-39')	4/2/2013	<5.0	<5.0	<1.0	<1.0	2.6	2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Depth to Groundwater Approx. 15 - 16'	6/11/2013	<5.0	<5.0	<1.0	<1.0	3.2	2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-40s (20-25')	4/3/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Depth to Groundwater Approx. 22 - 23'	6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-40d (37.5-42.5')	4/3/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Depth to Groundwater Approx. 21 - 22'	6/12/2013	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter; NC = No criteria; NA = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

810 Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 7.0 feet below ground surface (ft bgs) at MW-09s, 8.0 ft bgs at MW-20s (based on boring log for nearby soil boring B-29), 15.0 ft bgs at MW-23, 9.0 ft bgs at MW-27s, 20.5 ft bgs at MW-29d, and 14.0 ft bgs at MW-30s and MW-30d.

- 1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.
- 2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
- 3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.
- 4) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
- 5) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
- 6) Headspace present in the sample, results are approximate.

Table 6
Summary of Detected Volatile Organic Compounds at PRB Performance Monitoring Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	Acetone ⁽²⁾	2-Butanone	Benzene ⁽²⁾	Chloroethane	Chloroform	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽²⁾	Isopropylbenzene	n-Propyl Benzene ⁽²⁾	Tetrachloroethene	Toluene ⁽²⁾	1,1,1-Tri-chloroethane	1,1,2-Tri-chloroethane	Trichloroethene	1,2,4-Tri-methylbenzene	Vinyl Chloride	Total Xylenes ⁽²⁾	
Residential Health-Based DW Criteria	730	13,000	5.0	430	80	880	5.0	7.0	70	100	700	800	80	5.0	1,000	200	5.0	5.0	1,000	2.0	10,000	
Non-Residential Health-Based DW Criteria	2,100	38,000	5.0	1,700	80	2,500	5.0	7.0	70	100	700	2,300	230	5.0	1,000	200	5.0	5.0	2,900	2.0	10,000	
GSI Criteria	1,700	2,200	200 ⁽¹⁾	1,100 ⁽¹⁾	350	740	360 ⁽¹⁾	130	620	1,500 ⁽¹⁾	18	28	NC	60 ⁽¹⁾	270	89	330 ⁽¹⁾	200 ⁽¹⁾	17	13 ⁽¹⁾	41	
Residential GWSLs for Vapor Intrusion	8.2E+06	4.3E+06	27	44,000	140	4,300	41	370	83	360	700	10	92	94	36,000	17,000	96	10	1,700	2.8	10,000	
Non-Residential GWSLs for Vapor Intrusion	3.4E+07	1.8E+07	140	1.8E+05	720	18,000	210	1,600	350	1,500	2,600	53	390	460	1.5E+05	71,000	480	41	7,300	52	10,000	
Groundwater Contact Criteria	3.1E+07	2.4E+08	11,000	4.4E+05	1.5E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	56,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽³⁾	56,000	1,000	1.9E+05	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
PRB-01s (6-11') Depth to Groundwater* Approx. 5.5 - 6.5'	8/10/2011	<1,000	<250	<50	<250	<50	<50	<50	170	<50	<50	<50	<50	<50	<50	3,700	<50	3,900	<50	<50	<150	
	10/7/2011	<500	<120	<25	<120	<25	<25	<25	42	<25	<25	<25	<25	<25	<25	2,900	<25	3,300	<25	<25	<75	
	1/11/2012	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	960	<10	2,000	<10	<10	<30	
	4/10/2012	<400	<100	<20	<100	<20	<20	<20	31	230	<20	<20	<20	<20	<20	670	<20	1,800	<20	22	<30	
	7/16/2012	<200	<50	<10	<50	10	41	<10	120	750	<10	<10	<10	<10	<10	600	<10	1,600	<10	20	<30	
	10/10/2012	<200	<50	<10	<50	<10	29	<10	23	350	<10	<10	<10	<10	<10	570	<10	1,400	<10	<10	<30	
	3/4/2013	<200	130	<10	<50	<10	90	<10	27	88	<10	<10	<10	<10	<10	730	<10	1,100	<10	140	<30	
6/7/2013	<200	<50	<10	<50	<10	380	<10	24	620	<10	<10	<10	<10	<10	970	<10	960	<10	48	<30		
PRB-02s (6-11') Depth to Groundwater* Approx. 5.5 - 6.5'	8/10/2011	<500	<120	<25	<120	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	110	<25	3,100	<25	<25	<75	
	10/7/2011	<500	<120	<25	<120	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	80	<25	2,300	<25	<25	<75	
	1/11/2012	<400	<100	<20	<100	<20	<20	<20	<20	1,200	<20	<20	<20	<20	<20	64	<20	1,900	<20	<20	<60	
	4/10/2012	<400	<100	<20	<100	<20	<20	<20	<20	1,800	23	<20	<20	<20	<20	36	<20	1,300	<20	<20	<60	
	7/13/2012	<200	<50	<10	<50	<10	<10	<10	<10	1,000	19	<10	<10	<10	<10	29	<10	1,200	<10	<10	<30	
	10/10/2012	<200	<50	<10	<50	<10	<10	<10	<10	410	<10	<10	<10	<10	<10	24	<10	1,100	<10	33	<30	
	3/5/2013	<50	<12	<2.5	<12	<2.5	4.4	<2.5	<2.5	250	6.4	<2.5	<2.5	<2.5	<2.5	4.8	<2.5	310	<2.5	43	<7.5	
6/7/2013	<50	<12	<2.5	<12	<2.5	9.0	<2.5	<2.5	140	4.8	<2.5	<2.5	<2.5	<2.5	4.8	<2.5	280	<2.5	26	<7.5		
PRB-03s (6-11') Depth to Groundwater* Approx. 5.5 - 6.5'	8/10/2011	<200	<50	<10	<50	<10	19	<10	<10	<10	560	<10	<10	<10	<10	<10	<10	14	<10	<10	3,400	
	10/6/2011	<200	<50	<10	<50	<10	17	<10	<10	<10	510	<10	<10	<10	<10	<10	<10	10	<10	<10	2,990	
	1/11/2012	<100	<25	<5.0	<25	<5.0	13	<5.0	<5.0	<5.0	320	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	24	<5.0	<5.0	1,920	
	4/10/2012	<40	<10	<2.0	<10	<2.0	11	<2.0	<2.0	<2.0	170	2.3	2.2	<2.0	<2.0	3.6	<2.0	25	<2.0	<2.0	890	
	7/16/2012	<100	<25	<5.0	34	<5.0	26	<5.0	<5.0	<5.0	410	17	<5.0	<5.0	<5.0	<5.0	<5.0	11	14	<5.0	2,090	
	10/9/2012	<100	<25	<5.0	<25	<5.0	29	<5.0	<5.0	<5.0	370	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	21	5.0	10	2,100	
	3/4/2013	<100	<25	<5.0	<25	<5.0	56	<5.0	<5.0	<5.0	260	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	20	<5.0	7.8	1,410	
6/6/2013	<50	<12	<2.5	<12	<2.5	62	<2.5	<2.5	7.4	<2.5	220	<2.5	<2.5	<2.5	<2.5	<2.5	14	2.8	7.2	1,010		
PRB-04s (6-11') Depth to Groundwater* Approx. 6.0 - 7.0'	8/10/2011	<200	110	<10	<50	<10	<10	<10	590	<10	<10	<10	<10	<10	<10	100	<10	1,100	<10	<10	<30	
	10/7/2011	<500	900	<25	<120	<25	<25	<25	3,400	<25	<25	<25	<25	<25	<25	62	<25	<25	<25	<25	<75	
	1/11/2012	<500	440	<25	<120	<25	110	<25	<25	3,600	36	<25	<25	<25	<25	34	<25	<25	<25	67	<75	
	4/10/2012	<500	360	<25	130	<25	200	<25	<25	2,400	37	<25	<25	<25	<25	<25	<25	<25	26	<25	190	<75
	7/16/2012	<500	660	<25	120	<25	490	29	<25	2,500	67	<25	<25	<25	<25	<25	<25	<25	<25	<25	610	108
	10/4/2012	<200	<50	<10	74	<10	180	<10	<10	1,400	36	<10	<10	<10	<10	<10	<10	<10	<10	<10	430	<30
	3/4/2013	<100	<25	<5.0	46	<5.0	42	<5.0	<5.0	560	7.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	190	<15
6/6/2013	28	36	<1.0	58	<1.0	50	<1.0	1.0	200	2.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	73	<3.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

Bold font denotes concentrations detected above laboratory reporting limits

Green background denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 3.5 feet below ground surface (ft bgs) at PRB-09s; 4.0 ft bgs at PRB-06s; 5.0 ft bgs at PRB-08s, PRB-08d, and PRB-10s; 6.5 ft bgs at PRB-01s, PRB-02s, PRB-04s, and PRB-04d; 7.0 ft bgs at PRB-05s and PRB-07s; and 8.0 ft bgs at PRB-03s.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 6
Summary of Detected Volatile Organic Compounds at PRB Performance Monitoring Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	Acetone ⁽²⁾	2-Butanone	Benzene ⁽²⁾	Chloroethane	Chloroform	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽²⁾	Isopropylbenzene	n-Propyl Benzene ⁽²⁾	Tetrachloroethene	Toluene ⁽²⁾	1,1,1-Tri-chloroethane	1,1,2-Tri-chloroethane	Trichloroethene	1,2,4-Tri-methylbenzene	Vinyl Chloride	Total Xylenes ⁽²⁾	
Residential Health-Based DW Criteria	730	13,000	5.0	430	80	880	5.0	7.0	70	100	700	800	80	5.0	1,000	200	5.0	5.0	1,000	2.0	10,000	
Non-Residential Health-Based DW Criteria	2,100	38,000	5.0	1,700	80	2,500	5.0	7.0	70	100	700	2,300	230	5.0	1,000	200	5.0	5.0	2,900	2.0	10,000	
GSI Criteria	1,700	2,200	200 ⁽¹⁾	1,100 ⁽¹⁾	350	740	360 ⁽¹⁾	130	620	1,500 ⁽¹⁾	18	28	NC	60 ⁽¹⁾	270	89	330 ⁽¹⁾	200 ⁽¹⁾	17	13 ⁽¹⁾	41	
Residential GWSLs for Vapor Intrusion	8.2E+06	4.3E+06	27	44,000	140	4,300	41	370	83	360	700	10	92	94	36,000	17,000	96	10	1,700	2.8	10,000	
Non-Residential GWSLs for Vapor Intrusion	3.4E+07	1.8E+07	140	1.8E+05	720	18,000	210	1,600	350	1,500	2,600	53	390	460	1.5E+05	71,000	480	41	7,300	52	10,000	
Groundwater Contact Criteria	3.1E+07	2.4E+08	11,000	4.4E+05	1.5E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	56,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽³⁾	56,000	1,000	1.9E+05	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
PRB-04d (25-30') Depth to Groundwater* Approx. 6.0 - 7.0'	8/10/2011	<20	10	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.8	<1.0	12	<3.0
	10/7/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.4	<1.0	11	<3.0
	1/11/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	<1.0	9.4	<3.0
	4/10/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	9.4	<3.0
	7/16/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.2	<3.0
	10/4/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	13	<3.0
	3/4/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	17
6/6/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	14	<3.0
PRB-05s (6-11') Depth to Groundwater* Approx. 6.0 - 7.0'	8/11/2011	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	990	<10	<10	<30
	10/6/2011	<200	<50	<10	<50	<10	<10	<10	<10	21	<10	<10	<10	<10	<10	<10	<10	<10	1,000	<10	<10	<30
	1/12/2012	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	780	<10	<10	<30
	4/9/2012	<100	<25	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	630	<5.0	<5.0	<15
	7/12/2012	<100	<25	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	810	<5.0	<5.0	<15
	10/9/2012	<100	<25	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	760	<5.0	<5.0	<15
	3/5/2013	<100	27	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	720	<5.0	<5.0	<15
6/7/2013	<100	<25	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	620	<5.0	<5.0	<15	
PRB-06s (6-11') Depth to Groundwater* Approx. 6.0 - 6.5'	8/11/2011	<1,000	3,600	<50	<250	<50	360	<50	<50	4,200	<50	<50	<50	<50	<50	<50	<50	<50	310	<50	<50	<150
	10/6/2011	<1,000	5,800	<50	<250	<50	260	<50	<50	6,000	<50	<50	<50	<50	<50	<50	<50	<50	<50	71	<50	<150
	1/12/2012	<200	940	<10	81	<10	<10	<10	<10	300	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	35	<30
	4/10/2012	24	130	1.0	71	<1.0	<1.0	<1.0	<1.0	35	2.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	18	<3.0
	7/12/2012	<100	480	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<15
	10/9/2012	<100	170	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<15
	3/5/2013	<100	<25	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<15
6/7/2013	<100	38	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<15	
PRB-07s (7-12') Depth to Groundwater* Approx. 5.5 - 6.5'	8/10/2011	<200	120	<10	<50	<10	<10	<10	<10	880	<10	<10	<10	<10	<10	<10	<10	<10	1,200	<10	<10	<30
	10/7/2011	<200	<50	<10	<50	<10	16	<10	10	790	18	<10	<10	<10	<10	<10	<10	<10	1,400	<10	<10	<30
	1/11/2012	<200	<50	<10	<50	<10	<10	<10	<10	510	<10	<10	<10	<10	<10	<10	<10	<10	92	<10	1,300	<30
	4/10/2012	<200	<50	<10	<50	<10	<10	<10	<10	260	28	<10	<10	<10	<10	<10	<10	<10	56	<10	1,100	<30
	7/16/2012	<200	<50	<10	<50	<10	<10	<10	<10	200	50	<10	<10	<10	<10	<10	<10	<10	45	<10	1,300	<30
	10/4/2012	<200	<50	<10	<50	<10	<10	<10	<10	150	41	<10	<10	<10	<10	<10	<10	<10	17	<10	750	<30
	3/4/2013	<100	<25	<5.0	<25	<5.0	7.9	<5.0	<5.0	100	11	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.6	<5.0	480	<15
6/6/2013	<100	50	<5.0	<25	<5.0	5.6	<5.0	<5.0	570	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	16	<5.0	370	<15	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

Bold font denotes concentrations detected above laboratory reporting limits

 Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 3.5 feet below ground surface (ft bgs) at PRB-09s; 4.0 ft bgs at PRB-06s; 5.0 ft bgs at PRB-08s, PRB-08d, and PRB-10s; 6.5 ft bgs at PRB-01s, PRB-02s, PRB-04s, and PRB-04d; 7.0 ft bgs at PRB-05s and PRB-07s; and 8.0 ft bgs at PRB-03s.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 6
Summary of Detected Volatile Organic Compounds at PRB Performance Monitoring Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	Acetone ⁽²⁾	2-Butanone	Benzene ⁽²⁾	Chloroethane	Chloroform	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽²⁾	Isopropylbenzene	n-Propyl Benzene ⁽²⁾	Tetrachloroethene	Toluene ⁽²⁾	1,1,1-Tri-chloroethane	1,1,2-Tri-chloroethane	Trichloroethene	1,2,4-Tri-methylbenzene	Vinyl Chloride	Total Xylenes ⁽²⁾	
Residential Health-Based DW Criteria	730	13,000	5.0	430	80	880	5.0	7.0	70	100	700	800	80	5.0	1,000	200	5.0	5.0	1,000	2.0	10,000	
Non-Residential Health-Based DW Criteria	2,100	38,000	5.0	1,700	80	2,500	5.0	7.0	70	100	700	2,300	230	5.0	1,000	200	5.0	5.0	2,900	2.0	10,000	
GSI Criteria	1,700	2,200	200 ⁽¹⁾	1,100 ⁽¹⁾	350	740	360 ⁽¹⁾	130	620	1,500 ⁽¹⁾	18	28	NC	60 ⁽¹⁾	270	89	330 ⁽¹⁾	200 ⁽¹⁾	17	13 ⁽¹⁾	41	
Residential GWSLs for Vapor Intrusion	8.2E+06	4.3E+06	27	44,000	140	4,300	41	370	83	360	700	10	92	94	36,000	17,000	96	10	1,700	2.8	10,000	
Non-Residential GWSLs for Vapor Intrusion	3.4E+07	1.8E+07	140	1.8E+05	720	18,000	210	1,600	350	1,500	2,600	53	390	460	1.5E+05	71,000	480	41	7,300	52	10,000	
Groundwater Contact Criteria	3.1E+07	2.4E+08	11,000	4.4E+05	1.5E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	56,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽³⁾	56,000	1,000	1.9E+05	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
PRB-08s (6-11') Depth to Groundwater* Approx. 6.0 - 7.0'	8/10/2011	83	39	<1.0	<5.0	<1.0	11	<1.0	1.0	84	9.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.3	<1.0	31	<3.0	
	10/7/2011	240	300	<2.5	<12	<2.5	7.3	<2.5	<2.5	77	9.2	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	24	<7.5
	1/11/2012	<20	<5.0	<1.0	<5.0	<1.0	2.0	<1.0	<1.0	35	4.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10	<3.0
	4/10/2012	<20	<5.0	<1.0	<5.0	<1.0	1.3	<1.0	<1.0	18	2.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.5	<3.0
	7/13/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	11	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.8	<3.0
	10/4/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	11	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	<3.0
	3/5/2013	<20	<5.0	<1.0	<5.0	<1.0	3.6	<1.0	<1.0	27	3.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	<3.0
6/6/2013	<20	<5.0	<1.0	<5.0	<1.0	6.9	<1.0	<1.0	50	6.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	<3.0	
PRB-08d (18.5-23.5') Depth to Groundwater* Approx. 6.0 - 7.0'	8/10/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	14	<3.0
	10/7/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.6	<3.0
	1/11/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	<3.0
	4/10/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.1	<3.0
	7/13/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<3.0
	10/4/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	23	<3.0
	3/5/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	37	<3.0
6/6/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	37	<3.0	
PRB-09s (5-10') Depth to Groundwater* Approx. 6.5 - 7.5'	8/11/2011	4,200	8,200	<100	<500	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<300
	10/6/2011	13,000	17,000	<100	<500	<100	<100	<100	<100	<100	<100	<100	<100	<100	110	<100	<100	<100	<100	<100	<100	<300
	1/12/2012	<200	68	<10	<50	<10	<10	<10	<10	14	<10	<10	<10	<10	1,400	<10	<10	<10	<10	<10	<10	<30
	2/9/2012	<200	200	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	1,600	<10	<10	<10	<10	<10	<10	<30
	4/9/2012	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	2,000	<10	<10	<10	<10	<10	<10	<30
	7/13/2012	<400	<100	<20	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	2,000	<20	<20	<20	<20	<20	<20	<60
	10/9/2012	<100	<25	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	610	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<15
	3/5/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	<1.0	<1.0	54	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
6/7/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.2	<1.0	<1.0	<1.0	160	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0	
PRB-10s (6-11') Depth to Groundwater* Approx. 7.0 - 8.0'	8/11/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	11	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
	10/6/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	16	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
	1/12/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	42	4.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
	4/9/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	26	3.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
	7/13/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	17	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
	10/9/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	5.9	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
	3/5/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	15	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
6/6/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	31	4.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0	

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

Bold font denotes concentrations detected above laboratory reporting limits

Green background denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 3.5 feet below ground surface (ft bgs) at PRB-09s; 4.0 ft bgs at PRB-06s; 5.0 ft bgs at PRB-08s, PRB-08d, and PRB-10s; 6.5 ft bgs at PRB-01s, PRB-02s, PRB-04s, and PRB-04d; 7.0 ft bgs at PRB-05s and PRB-07s; and 8.0 ft bgs at PRB-03s.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 6
Summary of Detected Volatile Organic Compounds at PRB Performance Monitoring Locations
Former Tecumseh Products Company Site
Tecumseh, Michigan

Analyte	Acetone ⁽²⁾	2-Butanone	Benzene ⁽²⁾	Chloroethane	Chloroform	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽²⁾	Isopropylbenzene	n-Propyl Benzene ⁽²⁾	Tetrachloroethene	Toluene ⁽²⁾	1,1,1-Tri-chloroethane	1,1,2-Tri-chloroethane	Trichloroethene	1,2,4-Tri-methylbenzene	Vinyl Chloride	Total Xylenes ⁽²⁾		
Residential Health-Based DW Criteria	730	13,000	5.0	430	80	880	5.0	7.0	70	100	700	800	80	5.0	1,000	200	5.0	5.0	1,000	2.0	10,000		
Non-Residential Health-Based DW Criteria	2,100	38,000	5.0	1,700	80	2,500	5.0	7.0	70	100	700	2,300	230	5.0	1,000	200	5.0	5.0	2,900	2.0	10,000		
GSI Criteria	1,700	2,200	200 ⁽¹⁾	1,100 ⁽¹⁾	350	740	360 ⁽¹⁾	130	620	1,500 ⁽¹⁾	18	28	NC	60 ⁽¹⁾	270	89	330 ⁽¹⁾	200 ⁽¹⁾	17	13 ⁽¹⁾	41		
Residential GWSLs for Vapor Intrusion	8.2E+06	4.3E+06	27	44,000	140	4,300	41	370	83	360	700	10	92	94	36,000	17,000	96	10	1,700	2.8	10,000		
Non-Residential GWSLs for Vapor Intrusion	3.4E+07	1.8E+07	140	1.8E+05	720	18,000	210	1,600	350	1,500	2,600	53	390	460	1.5E+05	71,000	480	41	7,300	52	10,000		
Groundwater Contact Criteria	3.1E+07	2.4E+08	11,000	4.4E+05	1.5E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	56,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽³⁾	56,000	1,000	1.9E+05		
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
PRB-11s (15-20') Depth to Groundwater Approx. 15.5 - 16.5'	8/10/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.4	<1.0	<1.0	<3.0	
	10/6/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<3.0	
	1/11/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<3.0	
	4/9/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<3.0	
	7/16/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<3.0	
	10/11/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<3.0
	3/4/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<3.0
6/7/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<3.0	
PRB-12s (15-20') Depth to Groundwater Approx. 15.5 - 16.5'	8/11/2011	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	17	<10	33	<10	1,100	<10	<10	<30
	10/7/2011	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	17	<10	35	<10	1,300	<10	<10	<30
	1/12/2012	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	14	<10	26	<10	950	<10	<10	<30
	4/9/2012	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	25	<10	850	<10	<10	<30
	7/12/2012	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	14	<10	27	10	1,200	<10	<10	<30
	10/11/2012	<200	84	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	16	<10	30	<10	1,600	<10	<10	<30
	3/5/2013	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	21	<10	840	<10	<10	<30
6/5/2013	<200	<50	<10	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	19	<10	950	<10	<10	<30	
PRB-13s (19-24') Depth to Groundwater Approx. 18.0 - 19.0'	8/11/2011	<200	<50	<10	<50	<10	<10	<10	<10	12	<10	<10	<10	<10	<10	<10	380	<10	550	<10	14	<30	
	10/6/2011	<500	<120	<25	<120	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	1,100	<25	2,700	<25	<25	<75	
	1/12/2012	<500	<120	<25	<120	<25	<25	<25	<25	25	<25	<25	<25	<25	<25	<25	1,200	<25	2,800	<25	<25	<75	
	4/3/2012	<500	<120	<25	<120	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	1,100	<25	2,500	<25	<25	<75	
	7/12/2012	<400	<100	<20	<100	<20	<20	<20	23	<20	<20	<20	<20	<20	<20	<20	1,200	<20	2,900	<20	20	<60	
	10/11/2012	<400	110	<20	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	1,200	<20	3,100	<20	<20	<60	
	3/5/2013	<400	110	<20	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	1,300	<20	3,200	<20	<20	<60	
6/5/2013	<400	<100	<20	<100	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	1,200	<20	2,700	<20	<20	<60		
PRB-14s (19.5-24.5') Depth to Groundwater 17.0 - 18.0'	8/11/2011	<400	<100	<20	<100	<20	<20	<20	<20	65	<20	<20	<20	<20	<20	<20	910	<20	3,000	<20	62	<60	
	10/6/2011	<400	<100	<20	<100	<20	<20	<20	<20	48	<20	<20	<20	<20	<20	<20	1,100	<20	3,300	<20	65	<60	
	1/12/2012	<400	<100	<20	<100	<20	<20	<20	<20	53	<20	<20	<20	<20	<20	<20	1,000	<20	3,200	<20	57	<60	
	4/3/2012	<400	<100	<20	<100	<20	<20	<20	<20	29	<20	<20	<20	<20	<20	<20	990	<20	2,700	<20	32	<60	
	7/12/2012	<400	<100	<20	<100	<20	<20	<20	<20	33	<20	<20	<20	<20	<20	<20	1,200	<20	3,100	<20	43	<60	
	10/11/2012	<400	120	<20	<100	<20	<20	<20	<20	35	<20	<20	<20	<20	<20	<20	1,300	<20	3,500	<20	45	<60	
	3/5/2013	<400	120	<20	<100	<20	<20	<20	<20	29	<20	<20	<20	<20	<20	<20	1,100	<20	3,200	<20	41	<60	
6/5/2013	<400	<100	<20	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	1,200	<20	2,700	<20	<20	<60		

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 3.5 feet below ground surface (ft bgs) at PRB-09s; 4.0 ft bgs at PRB-06s; 5.0 ft bgs at PRB-08s, PRB-08d, and PRB-10s; 6.5 ft bgs at PRB-01s, PRB-02s, PRB-04s, and PRB-04d; 7.0 ft bgs at PRB-05s and PRB-07s; and 8.0 ft bgs at PRB-03s.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 6
 Summary of Detected Volatile Organic Compounds at PRB Performance Monitoring Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	Acetone ⁽²⁾	2-Butanone	Benzene ⁽²⁾	Chloroethane	Chloroform	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽²⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽²⁾	Isopropylbenzene	n-Propyl Benzene ⁽²⁾	Tetrachloroethene	Toluene ⁽²⁾	1,1,1-Tri-chloroethane	1,1,2-Tri-chloroethane	Trichloroethene	1,2,4-Tri-methylbenzene	Vinyl Chloride	Total Xylenes ⁽²⁾		
Residential Health-Based DW Criteria	730	13,000	5.0	430	80	880	5.0	7.0	70	100	700	800	80	5.0	1,000	200	5.0	5.0	1,000	2.0	10,000		
Non-Residential Health-Based DW Criteria	2,100	38,000	5.0	1,700	80	2,500	5.0	7.0	70	100	700	2,300	230	5.0	1,000	200	5.0	5.0	2,900	2.0	10,000		
GSI Criteria	1,700	2,200	200 ⁽¹⁾	1,100 ⁽¹⁾	350	740	360 ⁽¹⁾	130	620	1,500 ⁽¹⁾	18	28	NC	60 ⁽¹⁾	270	89	330 ⁽¹⁾	200 ⁽¹⁾	17	13 ⁽¹⁾	41		
Residential GWSLs for Vapor Intrusion	8.2E+06	4.3E+06	27	44,000	140	4,300	41	370	83	360	700	10	92	94	36,000	17,000	96	10	1,700	2.8	10,000		
Non-Residential GWSLs for Vapor Intrusion	3.4E+07	1.8E+07	140	1.8E+05	720	18,000	210	1,600	350	1,500	2,600	53	390	460	1.5E+05	71,000	480	41	7,300	52	10,000		
Groundwater Contact Criteria	3.1E+07	2.4E+08	11,000	4.4E+05	1.5E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	56,000	15,000	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽³⁾	56,000	1,000	1.9E+05		
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
PRB-15s (15-20') Depth to Groundwater 16.0 - 17.0'	8/11/2011	<400	<100	<20	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	1,200	<20	2,500	<20	<20	<60
	10/6/2011	<400	<100	<20	<100	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20	1,200	<20	2,700	<20	<20	<60
	1/12/2012	<400	<100	<20	<100	<20	<20	<20	<20	21	<20	<20	<20	<20	<20	<20	<20	850	<20	1,900	<20	<20	<60
	4/9/2012	<400	<100	<20	<100	<20	<20	<20	<20	1,700	<20	<20	<20	<20	<20	<20	<20	730	<20	1,800	<20	<20	<60
	7/12/2012	<400	<100	<20	<100	<20	<20	<20	<20	460	<20	<20	<20	<20	<20	<20	<20	580	<20	2,300	<20	<20	<60
	10/11/2012	<400	120	<20	<100	<20	<20	<20	<20	880	<20	<20	<20	<20	<20	<20	<20	750	<20	2,700	<20	<20	<60
	3/5/2013	<400	110	<20	<100	<20	<20	<20	<20	120	<20	<20	<20	<20	<20	<20	<20	570	<20	1,800	<20	<20	<60
6/5/2013	<400	<100	<20	<100	<20	<20	<20	<20	130	<20	<20	<20	<20	<20	<20	<20	260	<20	1,600	<20	<20	<60	
PRB-15d (29-34') Depth to Groundwater 16.0 - 17.0'	8/11/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	1.9	<1.0	<3.0	
	10/6/2011	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	5.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.3	<1.0	13	<1.0	1.9	<3.0	
	1/12/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	3.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.4	<1.0	28	<1.0	1.2	<3.0	
	4/9/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	6.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.0	<1.0	24	<1.0	2.0	<3.0	
	7/12/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	2.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	<1.0	19	<1.0	<1.0	<3.0	
	10/11/2012	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	3.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.2	<1.0	26	<1.0	<1.0	<3.0	
	3/5/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.0	<1.0	32	<1.0	<1.0	<3.0	
6/5/2013	<20	<5.0	<1.0	<5.0	<1.0	<1.0	<1.0	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	<1.0	19	<1.0	<1.0	<3.0		
PRB-16s (5-10') Depth to Groundwater 6.5 - 7.5'	8/6/2012	<20	<5.0	<1.0	<5.0	<1.0	5.3	<1.0	1.4	51	4.8	<1.0	<1.0	<1.0	<1.0	<1.0	5.5	3.5	<1.0	<1.0	<3.0		
	10/9/2012	<20	<5.0	<1.0	<5.0	<1.0	3.8	<1.0	1.1	31	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	5.5	4.6	<1.0	<1.0	<3.0		
	3/27/2013	<20	<5.0	<1.0	<5.0	<1.0	3.6	<1.0	1.1	29	3.2	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2.8	12	<1.0	<1.0	<3.0	
	6/6/2013	<20	<5.0	<1.0	<5.0	<1.0	4.4	<1.0	1.3	32	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	3.1	11	<1.0	<1.0	<3.0		

Notes:

Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, September 28, 2012.

Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

* An asterisk indicates that the depth to groundwater intersects or may periodically intersect an overlying clay unit. The depth to the bottom of the upper clay unit is approximately 3.5 feet below ground surface (ft bgs) at PRB-09s; 4.0 ft bgs at PRB-06s; 5.0 ft bgs at PRB-08s, PRB-08d, and PRB-10s; 6.5 ft bgs at PRB-01s, PRB-02s, PRB-04s, and PRB-04d; 7.0 ft bgs at PRB-05s and PRB-07s; and 8.0 ft bgs at PRB-03s.

1) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

3) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

Table 7
 Summary of Detected Volatile Organic Compounds at Perimeter and Off-Site Grab Groundwater Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	Carbon Disulfide	Dichloro-difluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride	Total Xylenes ⁽¹⁾
Residential DW Criteria	800	1,700	880	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Non-Residential DW Criteria	2,300	4,800	2,500	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Residential GWSL for Vapor Intrusion	2,400	7,000	4,300	41	370	83	360	700	94	36,000	17,000	96	10	2.8	10,000
Non-Residential GWSL for Vapor Intrusion	9,900	29,000	18,000	210	1,600	350	1,500	2,600	460	1.5E+05	71,000	480	41	52	10,000
GSI Criteria	NC	NC	740	360 ⁽²⁾	130	620	1,500 ⁽²⁾	18	60 ⁽²⁾	270	89	330 ⁽²⁾	200 ⁽²⁾	13 ⁽²⁾	41
Groundwater Contact Criteria	1.2E+06	3.0E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽⁴⁾	1,000	1.9E+05
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft) ⁽³⁾	Carbon Disulfide	Dichloro-difluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride	Total Xylenes ⁽¹⁾
B-01 (26-30')	3/9/2009	16.5	<1.0	<1.0	26	1.0	5.9	120	12	<1.0	<1.0	5.3	<1.0	<1.0	200	<1.0	<3.0
B-01 (46-50')	3/9/2009	16.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.2	<1.0	<1.0	6.8	5.0	<3.0
B-02 (22-26')	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.8	27	<3.0
B-02 (33-37')	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.0	16	<3.0
B-03 (26-30')	3/9/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.6	<1.0	<1.0	<1.0	1.4	<3.0
B-03 (38-42')	3/9/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	<1.0	<1.0	<1.0	<1.0	<3.0
B-04 (19-23')	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12	<3.0
B-04 (19-23') DUP-01	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12	<3.0
B-04 (29-33')	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-05 (14-18')	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<3.0
B-05 (22-26')	3/10/2009	7.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	<3.0
B-06 (44-48')	3/13/2009	23.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.5	<1.0	<1.0	<1.0	<1.0	<3.0
B-07 (44-48')	3/16/2009	24.0	3.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-08 (44-48')	3/13/2009	24.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-10 (24-28')	4/16/2009	26.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	57	<2.0
B-11 (29-33')	4/16/2009	26.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-12 (24-28')	4/16/2009	26.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.5	<2.0
B-12 (24-28') DUP-05	4/16/2009	26.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	<2.0
B-13 (29-33')	4/17/2009	28.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-13 (46-50')	4/16/2009	28.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-14 (16-20')	4/14/2009	16.0	--	--	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	1,100	<200
B-14 (36-40')	4/14/2009	16.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4	<2.0
B-15 (24-28')	4/20/2009	24.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	9.9	<1.0	2.8	<2.0
B-15 (44-48')	4/20/2009	24.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8.7	<2.0
B-17 (24-28')	4/20/2009	26.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-18 (22-26')	4/14/2009	21.5	--	--	<1.0	<1.0	<1.0	2.3	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<2.0
B-18 (32-36')	4/14/2009	21.5	--	--	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<2.0
B-19 (12-16')	4/15/2009	5.5 p, 12.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<2.0
B-19 (29-33')	4/15/2009	5.5 p, 12.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	10	<2.0
B-20 (8-12')	4/15/2009	5.0 p, 9.5*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-20 (18-22')	4/15/2009	5.0 p, 9.5*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-21 (6-10')	4/15/2009	6.0	--	--	3.3	<1.0	<1.0	3.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.9	1.0	<2.0

Notes:
 Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011. Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

-- = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

* An asterisk indicates that the observed depth to groundwater intersects or is near an overlying clay unit that may act as a localized confining unit. The true piezometric surface may have a depth less than the recorded depth to groundwater.

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

3) The approximate depth to groundwater is taken from soil boring logs. For sample locations with no soil boring log, approximate depth to groundwater is estimated using depth to groundwater data from nearby monitoring well and soil boring locations. Perched water, if present, is designated with a "p".

4) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

5) Sample locations designated with a "b" following the boring location number, for example B-27b, were collected from the utility corridor.

Table 7
 Summary of Detected Volatile Organic Compounds at Perimeter and Off-Site Grab Groundwater Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	Carbon Disulfide	Dichloro-difluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride	Total Xylenes ⁽¹⁾
Residential DW Criteria	800	1,700	880	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Non-Residential DW Criteria	2,300	4,800	2,500	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Residential GWSL for Vapor Intrusion	2,400	7,000	4,300	41	370	83	360	700	94	36,000	17,000	96	10	2.8	10,000
Non-Residential GWSL for Vapor Intrusion	9,900	29,000	18,000	210	1,600	350	1,500	2,600	460	1.5E+05	71,000	480	41	52	10,000
GSI Criteria	NC	NC	740	360 ⁽²⁾	130	620	1,500 ⁽²⁾	18	60 ⁽²⁾	270	89	330 ⁽²⁾	200 ⁽²⁾	13 ⁽²⁾	41
Groundwater Contact Criteria	1.2E+06	3.0E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽⁴⁾	1,000	1.9E+05
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft) ⁽⁵⁾	Carbon Disulfide	Dichloro-difluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride	Total Xylenes ⁽¹⁾	
B-21 (13-17')	4/15/2009	6.0	--	--	8.1	<1.0	<1.0	13	2.2	<1.0	<1.0	<1.0	3.6	<1.0	30	58	<2.0	
B-22 (18-23')	4/14/2009	19.0	--	--	<20	<20	<20	<20	<20	<20	<20	<20	53	<20	190	<20	<40	
B-22 (40-44')	4/14/2009	19.0	--	--	<1.0	<1.0	<1.0	13	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	3.0	<1.0	<2.0	
B-23 (14-18')	4/13/2009	13.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.8	<2.0	<2.0	23	<2.0	<6.0	
B-23 (14-18') DUP 01	4/13/2009	13.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5.0	<2.0	<2.0	26	<2.0	<6.0	
B-23 (30-34')	4/13/2009	13.0	--	--	<250	<250	<250	5,500	<250	<250	<250	<250	<250	<250	<250	1,700	<250	<750
B-23b (14-16') ⁽⁵⁾	4/15/2009	14.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	8.9	<1.0	<2.0	
B-24 (6-10')	4/13/2009	6.0*	--	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	150	<5.0	<15	
B-24 (28-32')	4/13/2009	6.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	6.7	<2.0	
B-24b (5-7') ⁽⁵⁾	4/16/2009	5.0*	--	--	<20	<20	<20	<20	<20	<20	<20	29	<20	740	<20	<40		
B-24b (5-7') DUP-04	4/16/2009	5.0*	--	--	<50	<50	<50	<50	<50	<50	<50	<50	<50	770	<50	<100		
B-25 (7-11')	4/17/2009	8.0 p, 14.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-25 (7-11') DUP-06	4/17/2009	8.0 p, 14.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-25 (31-35')	4/17/2009	8.0 p, 14.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-26 (16-20')	4/14/2009	15.0	--	--	<1.0	<1.0	<1.0	3.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.1	<2.0	
B-26 (29-33')	4/14/2009	15.0	--	--	<1.0	<1.0	<1.0	7.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	140	<2.0	
B-27b (8-10') ⁽⁵⁾	4/15/2009	7.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.2	<1.0	<2.0	
B-28b (16-18') ⁽⁵⁾	4/16/2009	16.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<2.0	
B-29 (8-12')	4/13/2009	5.0 p, 8.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-29 (38-42')	4/13/2009	5.0 p, 8.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	1.1	
B-29b ⁽⁵⁾	11/24/2009	5.0 p, 8.0*	<2.0	<10	27	<2.0	<2.0	6.2	<2.0	<2.0	210	<2.0	77	<2.0	76	<2.0	<6.0	
B-30 (6-11')	4/14/2009	6.5*	--	--	2.4	<1.0	<1.0	36	4.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-30 (30-34')	4/14/2009	6.5*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	
B-30 (30-34') DUP-02	4/14/2009	6.5*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-31 (10-14')	4/13/2009	7.5 p, 10.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.4	<1.0	<1.0	<1.0	8.1	<2.0	
B-31 (25-29')	4/13/2009	7.5 p, 10.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	390	<2.0	
B-32 (10-14')	4/14/2009	8.0*	--	--	<1.0	<1.0	<1.0	13	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	430	<2.0	
B-32 (25-29')	4/14/2009	8.0*	--	--	<100	<100	<100	1,200	<100	<100	<100	<100	<100	<100	<100	360	<200	
B-32b (8.5-10.5') ⁽⁵⁾	4/15/2009	8.0*	--	--	<1.0	<1.0	<1.0	3.4	<1.0	<1.0	1.7	<1.0	2.1	<1.0	13	1.6	<2.0	
B-33 (4-8')	4/15/2009	3.5 p, 7.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-33 (4-8') DUP-03	4/15/2009	3.5 p, 7.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
B-33 (17-21')	4/15/2009	3.5 p, 7.0*	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	

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Residential DW Criteria	800	1,700	880	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Non-Residential DW Criteria	2,300	4,800	2,500	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Residential GWSL for Vapor Intrusion	2,400	7,000	4,300	41	370	83	360	700	94	36,000	17,000	96	10	2.8	10,000
Non-Residential GWSL for Vapor Intrusion	9,900	29,000	18,000	210	1,600	350	1,500	2,600	460	1.5E+05	71,000	480	41	52	10,000
GSI Criteria	NC	NC	740	360 ⁽²⁾	130	620	1,500 ⁽²⁾	18	60 ⁽²⁾	270	89	330 ⁽²⁾	200 ⁽²⁾	13 ⁽²⁾	41
Groundwater Contact Criteria	1.2E+06	3.0E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽⁴⁾	1,000	1.9E+05
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft) ⁽³⁾	Carbon Disulfide	Dichloro-difluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride	Total Xylenes ⁽¹⁾	
B-33b ⁽⁵⁾	11/24/2009	3.5 p, 7.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.7	<1.0	<3.0
B-34 (14-18')	4/20/2009	12.5	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-34 (41-45')	4/20/2009	12.5	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
B-35 (5-9')	4/20/2009	6.0 p, 13.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<2.0
B-35 (5-9') DUP-07	4/20/2009	6.0 p, 13.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<2.0
B-35 (11-16')	9/17/2010	6.0 p, 13.0	<1.0	<5.0	1.1	<1.0	<1.0	69	5.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-35 (30-34')	4/20/2009	6.0 p, 13.0	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	450	<20
B-36 (12-16')	5/13/2009	6.0 p, 12.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-36 (16-20')	5/13/2009	6.0 p, 12.0*	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-36 (16-20') DUP-01	5/13/2009	6.0 p, 12.0*	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-37 (38.5-42.5')	5/12/2009	6.0 p, 12.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-38 (15-19')	5/13/2009	6.0 p, 16.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-38 (36-40')	5/13/2009	6.0 p, 16.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-39 (15-19')	5/13/2009	6.0 p, 16.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-40 (16-20')	5/15/2009	5.5 p, 16.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-40 (42-46')	5/15/2009	5.5 p, 16.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-45 (10-12')	2/22/2011	10.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-45 (14-16')	2/22/2011	10.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	33	<3.0
B-45 (22-24')	2/22/2011	10.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	<3.0
B-46 (8-10')	2/22/2011	8.0*	<1.0	<5.0	<1.0	<1.0	<1.0	8.2	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-46 (14-16')	2/22/2011	8.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	<3.0
B-46 (21-23')	2/22/2011	8.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	<3.0
B-47 (7.75-9.75')	2/22/2011	7.75*	<1.0	<5.0	15	<1.0	1.1	73	6.7	<1.0	<1.0	<1.0	<1.0	6.4	100	<1.0	2.3	<3.0
B-47 (7.75-9.75') DUP-01	2/22/2011	7.75*	<1.0	<5.0	14	<1.0	<1.0	71	6.9	<1.0	<1.0	<1.0	<1.0	6.8	97	<1.0	<3.0	
B-47 (14-16')	2/22/2011	7.75*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	23	<3.0
B-47 (21-23')	2/22/2011	7.75*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	28	<3.0
B-48 (7-9')	2/22/2011	7.0*	<1.0	<5.0	6.2	<1.0	<1.0	34	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-48 (13-15')	2/22/2011	7.0*	<1.0	<5.0	16	<1.0	2.1	110	11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	32	<3.0
B-48 (19.5-21.5')	2/22/2011	7.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	47	<3.0
B-49 (13-15')	2/22/2011	7.0*	<5.0	<25	8.2	<5.0	<5.0	33	<5.0	<5.0	<5.0	<5.0	9.0	<5.0	760	<5.0	<15	
B-49 (19.5-21.5')	2/22/2011	7.0*	<10	<50	<10	<10	<10	31	<10	<10	<10	<10	49	<10	1,600	<10	<30	
B-50 (7-9')	2/23/2011	7.0*	<5.0	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	33	<5.0	710	<5.0	<15	

Notes:
 Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011. Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

-- = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

* An asterisk indicates that the observed depth to groundwater intersects or is near an overlying clay unit that may act as a localized confining unit. The true piezometric surface may have a depth less than the recorded depth to groundwater.

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

3) The approximate depth to groundwater is taken from soil boring logs. For sample locations with no soil boring log, approximate depth to groundwater is estimated using depth to groundwater data from nearby monitoring well and soil boring locations. Perched water, if present, is designated with a "p".

4) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

5) Sample locations designated with a "b" following the boring location number, for example B-27b, were collected from the utility corridor.

Table 7
 Summary of Detected Volatile Organic Compounds at Perimeter and Off-Site Grab Groundwater Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	Carbon Disulfide	Dichloro-difluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethylbenzene ⁽¹⁾	Tetra-chloroethene	Toluene ⁽¹⁾	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride	Total Xylenes ⁽¹⁾
Residential DW Criteria	800	1,700	880	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Non-Residential DW Criteria	2,300	4,800	2,500	5.0	7.0	70	100	700	5.0	1,000	200	5.0	5.0	2.0	10,000
Residential GWSL for Vapor Intrusion	2,400	7,000	4,300	41	370	83	360	700	94	36,000	17,000	96	10	2.8	10,000
Non-Residential GWSL for Vapor Intrusion	9,900	29,000	18,000	210	1,600	350	1,500	2,600	460	1.5E+05	71,000	480	41	52	10,000
GSI Criteria	NC	NC	740	360 ⁽²⁾	130	620	1,500 ⁽²⁾	18	60 ⁽²⁾	270	89	330 ⁽²⁾	200 ⁽²⁾	13 ⁽²⁾	41
Groundwater Contact Criteria	1.2E+06	3.0E+05	2.4E+06	19,000	11,000	2.0E+05	2.2E+05	1.7E+05	12,000	5.3E+05	1.3E+06	21,000	13,000 ⁽⁴⁾	1,000	1.9E+05
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft) ⁽³⁾															
B-50 (13-15')	2/23/2011	7.0*	<50	<250	<50	<50	<50	<50	<50	<50	<50	<50	100	<50	5,400	<50	<150
B-50 (20-22')	2/23/2011	7.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	6.5	<3.0
B-50 (20-22') DUP-02	2/23/2011	7.0*	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	7.0	<3.0
B-51 (7-9')	2/23/2011	7.0*	<5.0	<25	<5.0	<5.0	<5.0	13	<5.0	<5.0	<5.0	<5.0	25	<5.0	580	<5.0	<15
B-51 (13-15')	2/23/2011	7.0*	<10	<50	36	<10	140	87	<10	<10	<10	<10	260	<10	1,600	<10	<30
B-51 (20-22')	2/23/2011	7.0*	<10	<50	<10	<10	<10	23	24	<10	<10	<10	<10	<10	970	62	<30
B-52 (7-9')	2/23/2011	7.0*	<500	<2,500	930	<500	<500	520	<500	4,400	<500	85,000	2,900	<500	2,900	<500	43,000
B-52 (13-15')	2/23/2011	7.0*	<10	<50	57	<10	<10	71	<10	430	<10	120	<10	30	270	1,326	
B-52 (20-22')	2/23/2011	7.0*	<5.0	<25	<5.0	<5.0	<5.0	140	16	<5.0	<5.0	<5.0	<5.0	<5.0	440	<5.0	<15
B-53 (18-20')	2/23/2011	17.5	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	120	<1.0	<3.0
B-53 (24-26')	2/23/2011	17.5	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-54 (18-20')	2/23/2011	18.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<3.0
B-54 (26-28')	2/23/2011	18.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0
B-58 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	620	--	16	--	--	--	--	5,300
B-59 (7-12')	4/1/2011	7.25*	--	--	--	--	--	--	--	2,500	--	41,000	--	--	--	--	24,000
B-60 (7-12')	4/1/2011	7.25*	--	--	--	--	--	--	--	4,700	--	55,000	--	--	--	--	48,000
B-61 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	5,200	--	61,000	--	--	--	--	41,000
B-62 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	1.4	--	<1.0	--	--	--	--	<3.0
B-63 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	3,800	--	21,000	--	--	--	--	30,000
B-63 (7-12') DUP-01	4/1/2011	7.0*	--	--	--	--	--	--	--	3,800	--	21,000	--	--	--	--	31,000
B-64 (7-12')	4/1/2011	7.25*	--	--	--	--	--	--	--	9,300	--	18,000	--	--	--	--	59,000
B-65 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	3,200	--	90	--	--	--	--	23,000
B-66 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	2,500	--	<50	--	--	--	--	28,000
B-67 (7-12')	4/1/2011	7.0*	--	--	--	--	--	--	--	140	--	<5.0	--	--	--	--	1,300
B-68 (14.5-16.5')	7/24/2012	15.0	<20	<100	<20	<20	<20	28	<20	<20	<20	<20	1,200	<20	1,900	<20	<60
B-68 (20.7-22.7')	7/24/2012	15.0	<50	<250	<50	<50	130	<50	<50	<50	<50	<50	5,300	<50	4,200	<50	<150
B-68 (27.7-29.7')	7/24/2012	15.0	<25	<125	<25	<25	<25	51	89	<25	<25	<25	<25	<25	2,800	<25	<75
MW-25 (46-51')	12/1/2009	19.0	<1.0	<5.0	<1.0	<1.0	<1.0	37	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0

Notes:
 Health-Based Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011. Groundwater Screening Levels (GWSLs) for Vapor Intrusion were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

ug/L = micrograms per liter

NC = No criteria

-- = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

* An asterisk indicates that the observed depth to groundwater intersects or is near an overlying clay unit that may act as a localized confining unit. The true piezometric surface may have a depth less than the recorded depth to groundwater.

Green Denotes concentrations above one or more criteria

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

3) The approximate depth to groundwater is taken from soil boring logs. For sample locations with no soil boring log, approximate depth to groundwater is estimated using depth to groundwater data from nearby monitoring well and soil boring locations. Perched water, if present, is designated with a "p".

4) At the request of USEPA, a site-specific groundwater contact criteria for trichloroethene (TCE) was recalculated to reflect revised TCE toxicity data which were published by USEPA on September 28, 2011.

5) Sample locations designated with a "b" following the boring location number, for example B-27b, were collected from the utility corridor.

Table 8
 Summary of Chlorinated Volatile Organic Compounds at On-Site Indoor Air Sample Locations
 Tecumseh Products Company
 Tecumseh, Michigan

Analyte		1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
95th Percentile Background Indoor Air Concentration ⁽¹⁾		<0.06	0.05	0.18	0.30	NA	1.4	5.0	0.63	0.04
Residential Indoor Air Screening Levels ⁽²⁾		120	0.24	50	1.7	17	5.0	1,100	0.37	0.62
Non-Residential Indoor Air Screening Levels ⁽²⁾		510	1.2	210	7.3	73	25	4,600	1.5	12
OHSA PELs ⁽³⁾		100,000	50,000	NC	200,000	200,000	100,000	350,000	100,000	1,000
Units		ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
IA-01 (SV-07)	1/4/2010	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	<0.70	16.0	<0.68
	2/2/2010 ⁽⁴⁾	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	<0.70	<0.70	<0.68
IA-02 (SV-08)	1/4/2010	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	<0.70	19.8	<0.68
	2/2/2010 ⁽⁴⁾	<0.77	<0.77	<0.77	<0.77	<1.5	<0.77	<0.77	4.3	<0.75
IA-03 (SV-09)	1/4/2010	<0.74	<0.74	<0.74	<0.74	<1.4	<0.74	<0.74	15.6	<0.73
	2/2/2010 ⁽⁴⁾	<0.80	<0.80	<0.80	<0.80	<1.5	<0.80	<0.80	2.6	<0.79
IA-04 (SV-10)	1/4/2010	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	<0.70	8.7	<0.68
	2/2/2010 ⁽⁴⁾	<0.77	<0.77	<0.77	<0.77	<1.5	<0.77	<0.77	2.7	<0.75
IA-05 (SV-18)	1/4/2010	<0.74	<0.74	<0.74	<0.74	<1.4	<0.74	<0.74	10.8	<0.73
	2/2/2010 ⁽⁴⁾	<0.80	<0.80	<0.80	<0.80	<1.5	<0.80	<0.80	3.0	<0.79
IA-06	2/2/2010 ⁽⁴⁾	<0.77	<0.77	<0.77	<0.77	<1.5	<0.77	<0.77	<0.77	<0.75
IA-07	2/2/2010 ⁽⁴⁾	<0.80	<0.80	<0.80	<0.80	<1.5	<0.80	<0.80	4.0	<0.79
IA-08	2/2/2010 ⁽⁴⁾	<0.96	<0.96	<0.96	<0.96	<1.8	<0.96	<0.96	<0.96	<0.94
IA-09 (SV-06)	3/25/2010	<0.65	<0.65	<0.65	<0.65	<1.2	<0.65	2.5	13.5	<0.64
IA-10 (SV-03)	3/25/2010	<0.65	<0.65	<0.65	<0.65	<1.2	<0.65	5.3	10.4	<0.64
IA-11 (SV-11)	3/25/2010	<0.65	<0.65	<0.65	<0.65	<1.2	<0.65	4.8	19.1	<0.64
IA-12 (SV-12)	3/25/2010	<0.72	<0.72	<0.72	<0.72	<1.4	<0.72	7.0	9.8	<0.70
IA-13 (SV-13)	3/25/2010	<0.70	0.83	<0.70	<0.70	<1.3	<0.70	10.8	8.5	<0.68
IA-14 (SV-14)	3/25/2010	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	6.3	8.0	<0.68
IA-15 (SV-15)	3/25/2010	<0.65	1.5	<0.65	<0.65	<1.2	<0.65	19.2	14.4	<0.64
IA-16 (SV-16)	3/25/2010	<0.70	0.83	<0.70	<0.70	<1.3	<0.70	10.1	10.0	<0.68
IA-17 (SV-17)	3/25/2010	<0.65	0.65	<0.65	<0.65	<1.2	<0.65	8.4	17.4	<0.64
IA-18 (SV-02)	3/25/2010	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	3.1	17.1	<0.68
IA-18 (SV-02) DUP-01	3/25/2010	<0.65	<0.65	<0.65	<0.65	<1.2	<0.65	3.0	18.6	<0.64
IA-19 (SV-01)	3/25/2010	<0.70	<0.70	<0.70	<0.70	<1.3	<0.70	<0.70	2.2	<0.68

Notes:

- 1) Background indoor air concentrations taken from the USEPA Report titled Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990-2005): A Compilation of Statistics for Assessing Vapor Intrusion, EPA 530-R-10-001, dated June 2011.
- 2) Residential and Non-Residential Indoor Air Screening Levels were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013
- 3) United States Department of Labor, Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs) over an 8-hour period (time weighted average).
- 4) Samples dated February 2, 2010 were collected during a ventilation test. Sample results are not representative of current, stagnant indoor air conditions.

Bold font denotes concentrations detected above laboratory reporting limits.

Green background Denotes concentrations above one or more applicable non-residential indoor air screening level.

ppbv = parts per billion by volume

NC = No Criteria

Table 9
 Summary of Chlorinated Volatile Organic Compounds at On-Site Sub-Slab Soil Gas Locations
 Tecumseh Products Company
 Tecumseh, Michigan

Analyte		1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	2-Propanol
Non-Residential Sub-Slab SGSLs ⁽¹⁾		69,000	160	28,000	980	9,800	3,300	610,000	210	1,500	NC
Units		ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	%
SV-01	10/29/2009	30.8	<0.94	<0.94	450	6.4	9.1	554	17,100	<0.92	0.010
SV-01	1/5/2010	178	41.6	<29.4	456	<56.4	128	482	13,000	<28.8	2.2E-05
SV-02	10/29/2009	39.8	<1.0	<1.0	137	18.3	8.4	6,180	11,800	<0.98	0.025
SV-02	1/5/2010	39.3	<17.5	<17.5	187	56.7	115	1,940	3,390	<17.1	9.8E-04
SV-02	3/26/2010	<261	<261	<261	326	<502	<261	5,570	16,700	<256	<2.5E-5
SV-03 ⁽²⁾	10/29/2009	--	--	--	--	--	--	--	--	--	24
SV-03	1/5/2010	87.9	<17.5	<17.5	874	<33.6	162	532	9,500	<17.1	2.8E-04
SV-04	10/29/2009	2.3	<0.97	<0.97	<0.97	<1.9	14.9	410	2,430	<0.95	0.004
SV-04	1/5/2010	<29.4	<29.4	<29.4	<29.4	<56.4	<29.4	289	1,330	<28.8	4.2E-06
SV-05	10/29/2009	2.6	<0.87	<0.87	<0.87	<1.7	<0.87	13.0	25.9	<0.86	0.055
SV-05	1/5/2010	<29.4	<29.4	<29.4	<29.4	<56.4	<29.4	<29.4	<29.4	<28.8	1.6E-03
SV-06	10/29/2009	467	<280	<280	<280	<538	<280	8,400	12,800	<274	1.3
SV-06	1/5/2010	416	<17.5	29.9	261	<33.6	38.3	7,200	15,200	<17.1	5.4E-05
SV-06	3/26/2010	371	474	<290	<290	<557	<290	5,840	6,580	<284	<2.8E-5
SV-07	10/29/2009	<321	<321	<321	1,030	<618	<321	<321	4,120	<315	0.002
SV-07	1/5/2010	119	<17.5	<17.5	806	327	<17.5	152	1,720	<17.1	2.1E-06
SV-08	10/29/2009	<280	<280	<280	<280	<538	<280	<280	13,400	<274	0.016
SV-08	1/5/2010	33.5	<17.5	<17.5	225	256	<17.5	185	2,370	<17.1	2.0E-06
SV-09	10/29/2009	<321	<321	<321	<321	<618	<321	<321	510	<315	1.4E-04
SV-09	1/5/2010	<17.5	17.8	<17.5	<17.5	<33.6	<17.5	59.8	453	<17.1	8.4E-05
SV-10	10/29/2009	<290	<290	<290	<290	<557	<290	<290	<290	<284	0.52
SV-10	1/5/2010	<29.4	<29.4	<29.4	<29.4	<56.4	<29.4	<29.4	644	<28.8	3.7E-06
SV-11	10/29/2009	<4,470	<4,470	<4,470	<4,470	<8,600	<4,470	6,490	118,000	<4,390	8.1E-04
SV-11	1/5/2010	87.5	183	<47.0	1,010	<90.3	53.0	2,190	20,200	<46.1	7.4E-05
SV-11	3/26/2010	95.3	<18.1	<18.1	743	<34.8	<18.1	1,200	9,670	<17.7	8.60E-06
SV-12	10/29/2009	<321	<321	<321	<321	<618	<321	13,200	13,300	<315	0.002
SV-12	1/5/2010	61.1	<17.5	88.3	30.6	<33.6	<17.5	9,270	10,500	<17.1	3.9E-05
SV-12	3/26/2010	<579	<579	<579	<579	<1,110	<579	14,900	8,230	<568	<5.6E-5
SV-13	10/29/2009	<321	<321	1,160	<321	<618	<321	19,200	6,660	<315	8.4E-05
SV-13	1/5/2010	46.1	363	242	71.0	<33.6	93.8	10,900	4,840	<17.1	4.4E-06
SV-13 (DUP-01)	1/5/2010	62.5	<17.5	356	92.4	<33.6	44.2	4,810	2,810	<17.1	6.3E-04
SV-14 ⁽²⁾	10/30/2009	--	--	--	--	--	--	--	--	--	16
SV-14	1/5/2010	<29.4	<29.4	<29.4	<29.4	<56.4	<29.4	118	219	<28.8	3.2E-06
DUP-01 (SV-14)	10/30/2009	<223	<223	<223	<223	<429	<223	261	555	<219	0.39
SV-15	10/29/2009	<290	<290	4,360	<290	<557	<290	208,000	45,400	<284	1.5
SV-15	1/5/2010	468	<29.4	3,850	537	<56.4	344	436,000	103,000	<28.8	2.3E-05
SV-15	3/26/2010	<16,700	<16,700	<16,700	<16,700	<32,200	<16,700	186,000	43,600	<16,400	<1.6E-3
SV-15 (DUP-02)	3/26/2010	<16,700	<16,700	<16,700	<16,700	<32,200	<16,700	191,000	45,700	<16,400	<1.6E-3
SV-16 ⁽²⁾	10/29/2009	--	--	--	--	--	--	--	--	--	9.7
SV-16	1/5/2010	222	<17.5	93.0	551	<33.6	<17.5	3,930	5,670	<17.1	<1.7E-06
SV-16	3/26/2010	313	<280	<280	707	<538	<280	6,200	4,650	<274	<2.7E-5
SV-17	10/29/2009	<321	<321	<321	<321	<618	<321	9,320	14,700	<315	7.5E-04
SV-17	1/5/2010	<29.4	<29.4	44.9	49.3	<56.4	<29.4	7,360	7,160	<28.8	7.1E-05
SV-18	10/29/2009	2,910	<310	<310	313	1,730	<310	324	11,100	<304	1.0
SV-18	1/5/2010	762	<17.5	36.4	138	552	<17.5	91.3	6,820	<17.1	<1.7E-06

Notes:

1) Non-Residential Sub-Slab Soil Gas Screening Levels (SGSLs) were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013

2) Elevated concentrations of 2-propanol (tracer) detected. Analytical data for other analytes are presumed to be invalid (-).

Bold font denotes concentrations detected above laboratory reporting limits.

Green background Denotes concentrations above non-residential SGSLs

ppbv = parts per billion by volume

NC = No Criteria

Table 10
 Summary of Chlorinated Volatile Organic Compounds at Off-Site Soil Gas Sample Locations
 Tecumseh Products Company
 Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride	
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210	
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000	
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
SG-01 (8-8.5')	4/5/2010	5.7	<2.3	4.4	17.0	<4.4	<2.3	279	396	<2.3
	5/20/2010 ⁽²⁾	52.4	<4.4	21.6	184	<4.4	52.1	1,690	2,800	<4.4
	10/21/2010	74.7	<16.8	<16.8	272	25.8	222	8,300	32,100	<16.8
	12/9/2010	<709	<709	<709	<709	<709	<709	6,440	17,800	<709
	4/13/2011	32.8	166	21.0	110	7.79	84.6	2,630	10,500	<6.7
	6/27/2011	<180	<90	<180	<180	<180	98.0	1,420	7,340	<90
	9/28/2011	<100	<100	<100	220	<200	150	4,300	19,000	<100
	11/21/2011 ⁽³⁾	--	--	--	--	--	--	--	--	--
	1/30/2012	10	<4.0	6.2	17	<8.0	<4.0	610	700	<4.0
	6/27/2012	53	<5.0	13	170	19	190	4,700	23,000	<5.0
	10/1/2012	56	<50	<50	190	<100	310	5,100	16,000	<50
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	10	1.9	<1.0
	3/14/2013	4.7	<1.0	4.7	6.7	<2.0	<1.0	300	190	<1.0
	5/30/2013 ⁽⁴⁾	<120	<24	<120	<120	<120	49	1,400	3,700	<19
6/24/2013 ⁽³⁾	--	--	--	--	--	--	--	--	--	
8/8/2013	110	<1.0	30	440	45	2,200	12,000	110,000	<1.0	
SG-01 (DUP-01)	4/5/2010	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
	5/20/2010 ⁽²⁾	63.2	<4.4	31.0	245	22.6	256	2,120	3,770	<4.4
	9/28/2011	<100	<100	<100	270	<200	200	5,800	28,000	<100
	11/21/2011	22 ⁽⁷⁾	<5.0	9.9	48	<10	25	1,700	8,500	<5.0
	1/30/2012	15	<4.0	9.3	26	<8.0	4.0	920	1,000	<4.0
SG-02 (5.5-6')	4/5/2010	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	19.6	<4.0	<4.0
	10/21/2010	<12.5	<12.5	<12.5	<12.5	<12.5	532	328	1,610	<12.5
	12/9/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/31/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/27/2011	8.5	<3.5	<7.0	28.0	8.6	1,240	943	3,970	<3.5
	9/28/2011	<5.0	<5.0	<5.0	6.1	<10	1,100	230	550	<5.0
	11/21/2011	2.3	<1.0	<1.0	2.6	2.5	400	120	310	1.1
	1/30/2012	<1.0	<1.0	2.1	<1.0	<2.0	<1.0	8.6	2.3	<1.0
	6/27/2012	18	<1.0	4.2	1,300	52	780	430	2,200	3.3
	10/2/2012	11	<5.0	<5.0	260	33	280	510	1,900	<5.0
	11/27/2012	4.6	<1.0	2.4	44	7.3	3.4	80	120	<1.0
	3/26/2013	<2.0	<2.0	3.4	46	4.6	10	32	100	2.1
5/30/2013 ⁽⁷⁾	7.3	<2.0	4.5	200	22	350	380	1,900	<2.0	
8/9/2013	17	<1.0	12	220	46	4,800	990	9,100	<1.0	

Notes:

- As recommended by USEPA in an email dated August 1, 2013, deep soil gas screening levels (SGSLs) are taken from the May 2013 Michigan Department of Environmental Quality (MDEQ) Final Guidance Document for the Vapor Intrusion Pathway.
- Elevated concentrations of 2-propanol (tracer) detected: DUP-01 results from 5/20/10 reflect true soil gas concentrations. Tracer concentration from SG-01 and analytical data from DUP-01 suggests that sample was diluted with approximately 30-percent ambient air.
- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
- Analyte was evaluated for detection to the method detection limit.
- Quality control results are outside the established control limits, the result is approximate.
- Sample port is screened in the low permeability zone. Available sample volume insufficient for analysis.

Bold font denotes concentrations detected above laboratory reporting limits.

Denotes concentrations above one or more soil gas screening level

ppbv - parts per billion by volume

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 Tecumseh Products Company
 Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
SG-03 (5-5.5')	4/5/2010	<2.6	<2.6	<2.6	<2.6	<5.1	<2.6	<2.6	<2.6
	10/21/2010	91.0	<15.7	<15.7	193	90.3	<15.7	<15.7	<15.7
	12/9/2010	47.7	<11.9	<11.9	98.0	48.5	<11.9	<11.9	<11.9
	3/31/2011	<0.56	<0.56	<0.57	<0.57	<0.57	<0.57	<0.56	<0.57
	6/27/2011	<0.36	<0.18	<0.37	<0.37	<0.37	6.8	4.8	22.3
	9/28/2011	3.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0
	11/21/2011	3.5	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	1/30/2012 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	6/27/2012	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	12
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
3/26/2013 ⁽³⁾	--	--	--	--	--	--	--	--	
4/15/2013 ⁽³⁾	--	--	--	--	--	--	--	--	
SG-03R (5-5.5')	5/30/2013	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0
	8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
SG-04 (5-5.5')	4/5/2010	<2.6	<1.3 ⁽⁶⁾	<2.6	<2.6	<4.9	<2.6	<2.6	<2.6
	9/23/2010	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
	12/9/2010	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
	3/31/2011	<1.6	<1.6	<1.6	<1.6	<1.6	2.0	<1.6	<1.6
	6/7/2011	<1.0	<0.53	<1.1	<1.1	<1.1	<0.52	<1.0	<0.53
	9/28/2011	<1.0	<1.0	<1.0	<1.0	<2.0	1.7	<1.0	<1.0
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	1.0
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	5/24/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0
8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	4.7	

Notes:

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- Elevated concentrations of 2-propanol (tracer) detected; DUP-01 results from 5/20/10 reflect true soil gas concentrations. Tracer concentration from SG-01 and analytical data from DUP-01 suggests that sample was diluted with approximately 30-percent ambient air.
- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
- Analyte was evaluated for detection to the method detection limit.
- Quality control results are outside the established control limits, the result is approximate.
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MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210	
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000	
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
SG-05 (7.5-8')	4/5/2010	<2.6	<2.6	<2.6	<2.6	<4.9	<2.6	28.7	26.6	<2.5
	10/21/2010	<16.8	<16.8	<16.8	<16.8	<16.8	<16.8	708	1,320	<16.8
	12/9/2010	<15.7	<15.7	<15.7	<15.7	<15.7	<15.7	357	538	<15.7
	3/31/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/27/2011	<0.34	<0.17	<0.35	<0.35	<0.35	<0.17	2.2	0.20	<0.17
	9/28/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	2.1	1.1	<1.0
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	1/30/2012 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.1	<1.0	<1.0
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	220	380	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	54	22	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
5/23/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2	<1.0	16	21	<1.0	
SG-05 (DUP-01)	10/21/2010	<16.8	<16.8	<16.8	<16.8	<16.8	<16.8	581	1,020	<16.8
	12/9/2010	<211	<211	<211	<211	<211	<211	772	849	<211
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	190	370	<1.0
SG-06 (8-8.5')	4/5/2010	<2.6	<2.6	<2.6	<2.6	<4.9	<2.6	<2.6	7.2	<2.5
	5/20/2010	<4.6	<4.6	<4.6	<4.6	<4.6	9.5	6.0	104	<4.6
	9/21/2010	<29.2	<29.2	<29.2	<29.2	<29.2	62.2	<29.2	263	<29.2
	12/9/2010	<3.9	<3.9	<3.9	6.1	<3.9	4.3	7.4	64.9	<3.9
	3/31/2011	0.73	<0.17	<0.35	<0.35	1.3	<0.17	1.7	14.1	<0.17
	6/7/2011	0.88	<0.18	<0.37	5.6	2.5	7.5	2.5	50.2	<0.18
	9/28/2011	3.6	<2.0	<2.0	35	6.4	16	7.7	150	<2.0
	11/21/2011	2.2	<1.0	<1.0	9.2	2.6	<1.0	5.1	29	1.1
	1/30/2012	1.4	<1.0	<1.0	5.4	<2.0	<1.0	1.3	9.7	<1.0
	6/27/2012	<1.0	<1.0	<1.0	7.7	<2.0	9.1	3.4	68	<1.0
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	2.3 ⁽⁷⁾	<1.0	12 ⁽⁷⁾	<1.0
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	2.1	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
5/23/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	20	<1.0	10	<1.0	

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- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
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Table 10
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Tecumseh Products Company
Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
SG-07 (8-8.5')	4/5/2010	<75.2	<75.2	<75.2	<75.2	<75.2	<75.2	<75.2	<75.2
	5/20/2010	<5.0	<5.0	<5.0	<5.0	<5.0	13.8	6.8	145
	9/21/2010	<69.6	<69.6	<69.6	<69.6	<69.6	140	<69.6	403
	12/9/2010	<22.2	<22.2	<22.2	<22.2	<22.2	24.4	<22.2	139
	3/31/2011	<0.34	<0.17	<0.35	<0.35	<0.35	5.9	4.3	47.2 ⁽⁷⁾
	6/7/2011	<0.36	<0.18	<0.37	<0.37	<0.37	23.6	4.4 ⁽⁷⁾	171 ⁽⁷⁾
	9/28/2011	<1.0	<1.0	<1.0	<1.0	<2.0	76	16	260
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	2.7	3.1
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	2.4
	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	67	9.0	250
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	16	8.8	130
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	1.7	3.4	34
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.4	13
5/23/2013	<1.0	<1.0	<1.0	<1.0	<2.0	27	4.0	120	
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	260	13	510	
SG-07 (DUP-01)	3/31/2011	<0.56	<0.56	<0.57	<0.57	<0.57	7.9	5.0	90.6 ⁽⁷⁾
	6/7/2011	<0.36	<0.18	<0.37	<0.37	<0.37	28.4 ⁽⁷⁾	9.5 ⁽⁷⁾	97.2 ⁽⁷⁾
	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	66	9.3	250
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	1.5	3.1	33
	5/23/2013 ⁽⁴⁾	<4,900	<970	<5,000	<5,000	<5,000	<580	<3,600	<730
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	220	12	420	
SG-07 (DUP-02)	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.4	12
SG-08 (6.5-7')	4/5/2010	<2.6	<1.3 ⁽⁶⁾	<2.6	<2.6	<5.1	<2.6	<2.6	<2.6
	9/23/2010	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.5	3.5
	12/9/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	3/31/2011	<0.34	<0.17	<0.35	<0.35	<0.35	0.29	3.4	<0.17
	6/27/2011	<0.34	<0.17	<0.35	<0.35	<0.35	<0.17	0.97	<0.18
	9/28/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.9	<1.0
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	6.9	1.3
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	6/29/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.8	2.0
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	5/24/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0
8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	5.4	8.6	
SG-08 (DUP-02)	5/24/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0
	8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.8	7.1

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- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
- Analyte was evaluated for detection to the method detection limit.
- Quality control results are outside the established control limits, the result is approximate.
- Sample port is screened in the low permeability zone. Available sample volume insufficient for analysis.

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Table 10
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 Tecumseh Products Company
 Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride	
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210	
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000	
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
SG-09 (5.5-6')	4/5/2010 ⁽³⁾	--	--	--	--	--	--	--	--	
	5/20/2010	10.6	<4.4	<4.4	<4.4	<4.4	<4.4	123	176	<4.4
	9/23/2010	<23.4	<23.4	<23.4	<23.4	<23.4	<23.4	142	436	<23.4
	12/9/2010	<13.2	<13.2	<13.2	<13.2	<13.2	<13.2	61.8	51.7	<13.2
	3/31/2011	4.3	<0.17	<0.35	1.3	<0.35	<0.17	52.5	13.9	<0.17
	6/27/2011	5.4	<0.17	<0.35	1.4	<0.35	<0.17	52.8	45.8	<0.17
	9/28/2011	1.7	<1.0	<1.0	<1.0	<2.0	<1.0	13	7.9	<1.0
	11/21/2011	3.8	<1.0	<1.0	<1.0	<2.0	<1.0	32	9.1	<1.0
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	7.2	1.3	<1.0
	6/29/2012	<1.0	<1.0	<1.0	1.0	<2.0	<1.0	89	190	<1.0
	10/2/2012	1.0	<1.0	<1.0	<1.0	<2.0	<1.0	56	74	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.3	1.9	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	5.4	4.0	<1.0
5/24/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	18	27.0	<2.0	
8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	67	270	<1.0	
SG-09 (DUP-02)	6/29/2012	<1.0	<1.0	<1.0	1.2	<2.0	<1.0	93	200	<1.0
SG-10 (5-5.5')	4/5/2010	<40.3 ⁽⁶⁾	<40.3 ⁽⁶⁾	<80.6	<80.6	<80.6	<40.3 ⁽⁶⁾	<80.6	<40.3 ⁽⁶⁾	<40.3 ⁽⁶⁾
	9/21/2010	<4.4	<2.2 ⁽⁶⁾	<4.4	<4.4	<4.4	<4.4	<4.4	11.5	<4.4
	12/9/2010	<8.7	<4.4 ⁽⁶⁾	<8.7	<8.7	<8.7	<4.4 ⁽⁶⁾	<8.7	<8.7	<8.7
	3/31/2011	<0.61	<0.61	<0.62	<0.62	<0.62	<0.61	<0.59	<0.60	<0.62
	6/27/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/28/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.4	19	<1.0
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	19	56	<1.0
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	6/27/2012	<1.0	<1.0	<1.0	4.8	<2.0	1.9	46	210	<1.0
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	11/29/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	5/23/2013 ⁽³⁾	--	--	--	--	--	--	--	--	--
6/24/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	
8/8/2013	<1.0	<1.0	<1.0	1.6	<2.0	29	6.9	53	<1.0	

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MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
SG-11 (7.5-6')	4/5/2010	<2.8	<1.4 ⁽⁶⁾	<2.8	<2.8	<5.4	<2.8	<2.8	<2.8
	9/23/2010	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
	12/9/2010	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84
	3/31/2011	<0.56	<0.56	<0.57	<0.57	<0.57	<0.57	<0.56	<0.58
	6/7/2011	<0.39	<0.19	<0.40	<0.40	<0.40	0.89	0.54	1.2
	9/28/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	6.8	18
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	11/29/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
5/23/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	1.2	<1.0	3.0	
SG-12 (5-5.5')	4/5/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	5/20/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	9/21/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/2010	<2.5	<1.3 ⁽⁶⁾	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	3/31/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	6/27/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	9/28/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	1/30/2012 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
3/26/2013 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
5/24/2013 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
SG-12R (7-7.5')	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	10/3/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	11/28/2012 ⁽⁸⁾	NS	NS	NS	NS	NS	NS	NS	NS
	3/26/2013 ⁽⁸⁾	NS	NS	NS	NS	NS	NS	NS	NS
	5/24/2013 ⁽⁸⁾	NS	NS	NS	NS	NS	NS	NS	NS
8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	

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Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
SG-13 (5.5-6')	4/5/2010	<2.5	<1.3 ⁽⁶⁾	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	5/20/2010	<4.5	<2.2 ⁽⁶⁾	<4.5	<4.5	<4.5	<4.5	<4.5	6.1
	9/23/2010	<1.5	<1.5	<1.5	2.5	5.6	<1.5	<1.5	<1.5
	12/9/2010	<1.6	<1.6	<1.6	<1.6	2.9	<1.6	<1.6	<1.6
	3/31/2011	<0.56	<0.56	<0.57	<0.57	<0.57	<0.57	<0.56	<0.57
	6/7/2011	1.5	<0.19	<0.40	4.8	10.8	0.77	0.81	1.6
	9/28/2011	1.1	<1.0	<1.0	6.2	10	<1.0	<1.0	<1.0
	11/21/2011	1.9	<1.0	<1.0	2.0	4.0	<1.0	<1.0	<1.0
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	6/26/2012	<1.0	<1.0	<1.0	4.9	7.7	<1.0	<1.0	<1.0
	10/2/2012	<1.0	<1.0	<1.0	3.4 ⁽⁷⁾	5.9 ⁽⁷⁾	<1.0	<1.0	<1.0
	11/28/2012	<1.0	<1.0	<1.0	1.7	2.7	<1.0	<1.0	<1.0
	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
5/23/2013	<1.0	<1.0	<1.0	<1.0	3.4	<1.0	<1.0	<1.0	
8/8/2013	<1.0	<1.0	<1.0	1.3	8.8	<1.0	<1.0	<1.0	
SG-14 (6.5-7') ⁽⁵⁾	4/5/2010	NS	NS	NS	NS	NS	NS	NS	NS
	5/20/2010	NS	NS	NS	NS	NS	NS	NS	NS
	9/21/2010	NS	NS	NS	NS	NS	NS	NS	NS
	12/9/2010	NS	NS	NS	NS	NS	NS	NS	NS
	3/31/2011	NS	NS	NS	NS	NS	NS	NS	NS
	6/27/2011	NS	NS	NS	NS	NS	NS	NS	NS
	9/28/2011	NS	NS	NS	NS	NS	NS	NS	NS
	11/21/2011	NS	NS	NS	NS	NS	NS	NS	NS
1/30/2012	NS	NS	NS	NS	NS	NS	NS	NS	
SG-14R (6.5-7')	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	1.3
	10/3/2012 ⁽⁸⁾	NS	NS	NS	NS	NS	NS	NS	NS
	11/28/2012 ⁽⁸⁾	NS	NS	NS	NS	NS	NS	NS	NS
	3/14/2013	NS	NS	NS	NS	NS	NS	NS	NS
	5/24/2013 ⁽³⁾	--	--	--	--	--	--	--	--
	8/9/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	1.6

Notes:

- As recommended by USEPA in an email dated August 1, 2013, deep soil gas screening levels (SGSLs) are taken from the May 2013 Michigan Department of Environmental Quality (MDEQ) Final Guidance Document for the Vapor Intrusion Pathway.
- Elevated concentrations of 2-propanol (tracer) detected; DUP-01 results from 5/20/10 reflect true soil gas concentrations. Tracer concentration from SG-01 and analytical data from DUP-01 suggests that sample was diluted with approximately 30-percent ambient air.
- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
- Analyte was evaluated for detection to the method detection limit.
- Quality control results are outside the established control limits, the result is approximate.
- Sample port is screened in the low permeability zone. Available sample volume insufficient for analysis.

Bold font denotes concentrations detected above laboratory reporting limits.

Green background Denotes concentrations above one or more soil gas screening level

ppbv - parts per billion by volume

NC - No Criteria

NS - No Sample

NA - Not Applicable

Table 10
 Summary of Chlorinated Volatile Organic Compounds at Off-Site Soil Gas Sample Locations
 Tecumseh Products Company
 Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride	
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210	
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000	
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
SG-15 (11-11.5')	9/23/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
	12/15/2010 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
	3/31/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
	6/27/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
	9/28/2011 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	10	30	<1.0
	1/30/2012 ⁽⁵⁾	NS	NS	NS	NS	NS	NS	NS	NS	
SG-15R (8.75-9.25')	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	10/3/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	5/24/2013 ^(4,6)	<1.6	<1.6	<1.9	<1.6	<1.2	<1.0	<1.0	<1.2	
	8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
SG-16 (7.5-8')	9/23/2010	<2.5	<2.5	<2.5	<2.5	<2.5	2.6	<2.5	<2.5	
	12/9/2010	<15.7	<7.8 ⁽⁶⁾	<15.7	<15.7	<15.7	<7.8 ⁽⁶⁾	<15.7	<15.7	
	3/31/2011	<0.61	<0.61	<0.60	<0.60	<0.60	<0.61	<0.59	<0.62	
	6/7/2011	<1.1	<0.53	<1.1	<1.1	<1.1	<0.54	<1.1	0.62	
	9/28/2011	<1.0	<1.0	<1.0	3.3	<2.0	7.4	<1.0	28	
	11/21/2011	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	1/30/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	5/23/2013 ⁽⁴⁾	<4,900	<970	<5,000	<5,000	<5,000	<580	<3,600	<730	
	6/24/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	13		
SG-16 (DUP-02)	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
	6/24/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	
SG-17 (8-8.5')	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	1.8	330	5.7	
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	250	<1.0	
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	42	<1.0	
	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	42	<1.0	
	5/23/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	83	<1.0	
	8/8/2013	<2.0	<2.0	<2.0	<2.0	<4.0	6.0	550	<2.0	

Notes:

- As recommended by USEPA in an email dated August 1, 2013, deep soil gas screening levels (SGSLs) are taken from the May 2013 Michigan Department of Environmental Quality (MDEQ) Final Guidance Document for the Vapor Intrusion Pathway.
- Elevated concentrations of 2-propanol (tracer) detected: DUP-01 results from 5/20/10 reflect true soil gas concentrations. Tracer concentration from SG-01 and analytical data from DUP-01 suggests that sample was diluted with approximately 30-percent ambient air.
- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
- Analyte was evaluated for detection to the method detection limit.
- Quality control results are outside the established control limits, the result is approximate.
- Sample port is screened in the low permeability zone. Available sample volume insufficient for analysis.

Bold font denotes concentrations detected above laboratory reporting limits.

Denotes concentrations above one or more soil gas screening level

ppbv - parts per billion by volume

NC - No Criteria

NS - No Sample

NA - Not Applicable

Table 10
 Summary of Chlorinated Volatile Organic Compounds at Off-Site Soil Gas Sample Locations
 Tecumseh Products Company
 Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride	
MDEQ Residential SGSL ⁽¹⁾	41,000	82	17,000	580	5,800	1,700	360,000	120	210	
MDEQ Non-Residential SGSL ⁽¹⁾	690,000	1,600	280,000	9,800	98,000	33,000	6,100,000	2,100	15,000	
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
SG-18 (8-8.5')	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.1	2.3	<1.0
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	11/29/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	5/23/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	2.1	<1.0	6.4	<1.0
SG-19 (8-8.5')	6/26/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	5/24/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0
8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	
SG-20 (8-8.5')	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	5.4	1.5	17	<1.0
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	1.9	<1.0
	11/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	1.3	<1.0
	5/24/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	3.6	<2.0	<2.0	<2.0
	8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	3.1	1.0	<1.0
SG-21 (8-8.5')	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	10/2/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	11/29/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	5/24/2013 ⁽⁴⁾	<120	<24	<120	<120	<120	<15	<91	<18	<19
	6/24/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
SG-21 (DUP-01)	3/14/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
SG-21 (DUP-02)	11/29/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
TVP-02s (10-10.5')	6/27/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	1.2	8.8	<1.0
	10/1/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	1.2	<1.0
	11/28/2012	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	3/18/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	5/23/2013 ⁽⁴⁾	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0
	8/8/2013	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0

Notes:

- As recommended by USEPA in an email dated August 1, 2013, deep soil gas screening levels (SGSLs) are taken from the May 2013 Michigan Department of Environmental Quality (MDEQ) Final Guidance Document for the Vapor Intrusion Pathway.
- Elevated concentrations of 2-propanol (tracer) detected; DUP-01 results from 5/20/10 reflect true soil gas concentrations. Tracer concentration from SG-01 and analytical data from DUP-01 suggests that sample was diluted with approximately 30-percent ambient air.
- Elevated concentrations of tracer detected. Analytical data for other analytes are presumed to be invalid (-).
- Elevated detection limit due to siloxane contamination in sample.
- Water in sample point prevented sample collection.
- Analyte was evaluated for detection to the method detection limit.
- Quality control results are outside the established control limits, the result is approximate.
- Sample port is screened in the low permeability zone. Available sample volume insufficient for analysis.

Bold font denotes concentrations detected above laboratory reporting limits.

Denotes concentrations above one or more soil gas screening level

ppbv - parts per billion by volume

NC - No Criteria

NS - No Sample

NA - Not Applicable

Table 11
 Summary of Chlorinated Volatile Organic Compounds at Storm Water and Surface Water Sample Locations
 Tecumseh Products Company
 Tecumseh, Michigan

Analyte	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene ⁽¹⁾	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride	
GSI Criteria	740	360 ⁽²⁾	130	620	1,500 ⁽²⁾	60 ⁽²⁾	89	200 ⁽²⁾	13 ⁽²⁾	
Human Non-Cancer Value (Non-Drink)	400,000	420,000	33,000	36,000	19,000	1,800	1,300,000	550	4,400	
Human Cancer Value (Non-Drink)	NC	360	NC	NC	NC	60	NC	370	13	
Final Chronic Value	740	2,000	130	620	1,500	190	89	200	930	
Aquatic Maximum Value	6,600	8,200	1,200	5,500	14,000	1,400	800	1,800	8,400	
Final Acute Value	13,000	16,000	2,300	11,000	28,000	2,900	1,600	3,500	17,000	
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
STW-1	4/13/2009	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.85
	12/9/2009	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/2/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
STW-2	12/10/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/13/2009	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	23
	12/9/2009	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
9/2/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
12/10/2010 ⁽³⁾	--	--	--	--	--	--	--	--	--	
STW-3	4/13/2009	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
STW-4	4/13/2009	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
STW-5	4/13/2009	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	0.55	<0.5	<0.5
STW-6	4/13/2009	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
STW-7	4/13/2009	<0.5	<0.5	<0.5	0.64	<0.5	0.63	<0.5	2.7	<0.5
STW-8	4/13/2009	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Surface Water ⁽⁴⁾	5/26/2011	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SEEP	4/3/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/10/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	6/12/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WL-01	4/6/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	6/18/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/10/2010 ⁽⁵⁾	--	--	--	--	--	--	--	--	--
	2/25/2011 ⁽⁵⁾	--	--	--	--	--	--	--	--	--
	5/11/2011	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/3/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/3/2012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5/29/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

Notes:

Groundwater/Surface Water Interface (GSI) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011. Human Non-Cancer Values (HNV), Human Cancer Values (HCV), Final Chronic Values (FCV), Aquatic Maximum Values (AMV) and Final Acute Values (FAV) from MDEQ Surface Water Assessment Rule 57 Water Quality Values, September 7, 2012.

ug/L = micrograms per liter

NC = No criteria

-- = No data

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

1) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

2) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

3) Insufficient flow to collect sample.

4) Sample collected from surface water that accumulated adjacent to the permeable reactive barrier (PRB) trench during construction. Surface water was managed by pumping it to the city storm sewer in the Maumee Street right of way.

5) Frozen, no sample collected.

Table 12
Summary of Volatile Organic Compounds in Ambient Air
Tecumseh Products Company
Tecumseh, Michigan

Analyte	Units	Residential Indoor Air Screening Levels ⁽¹⁾	December 3-4, 2012
			Ambient Air
Acetone	ppbv	2,500	1.9
Benzene	ppbv	0.97	0.11
Bromodichloromethane	ppbv	0.21	<0.10
Bromoform	ppbv	2.3	<0.10
Bromomethane	ppbv	1.3	<0.10
2-Butanone (MEK)	ppbv	1,700	<0.20
Carbon disulfide	ppbv	220	<0.10
Carbon tetrachloride	ppbv	0.68	0.053
Chlorobenzene	ppbv	15	<0.10
Chloroethane	ppbv	3,800	<0.10
Chloroform	ppbv	2.2	<0.050
Chloromethane	ppbv	20	0.45
Dibromochloromethane	ppbv	0.12	<0.10
1,2-Dichlorobenzene	ppbv	49	<0.10
1,3-Dichlorobenzene	ppbv	0.49	<0.10
1,4-Dichlorobenzene	ppbv	0.62	<0.10
1,2-Dibromoethane (EDB)	ppbv	0.0056	<0.10
Dichlorodifluoromethane (F12)	ppbv	9,900	<0.20
1,1-Dichloroethane	ppbv	120	<0.10
1,2-Dichloroethane (EDC)	ppbv	0.24	<0.10
1,1-Dichloroethene	ppbv	50	<0.10
cis-1,2-Dichloroethene	ppbv	1.7	<0.10
trans-1,2-Dichloroethene	ppbv	17	<0.10
1,2-Dichloropropane	ppbv	0.86	<0.10
cis-1,3-Dichloropropene	ppbv	1.4	<0.10
trans-1,3-Dichloropropene	ppbv	1.4	<0.10
Dichlorotetrafluoroethane (F114)	ppbv	NC	<0.10
Ethylbenzene	ppbv	19	<0.10
4-Ethyltoluene	ppbv	NC	<0.10
Hexachlorobutadiene	ppbv	0.11	<0.20
2-Hexanone (MBK)	ppbv	7.4	<0.20
4-Methyl-2-pentanone (MIBK)	ppbv	730	<0.20
Methylene chloride (Dichloromethane)	ppbv	27	<0.10
Styrene	ppbv	11	<0.10
1,1,1,2-Tetrachloroethane	ppbv	0.51	<0.10
1,1,1,2,2-Tetrachloroethane	ppbv	0.065	<0.10
Tetrachloroethene	ppbv	5.0	<0.10
Toluene	ppbv	1,300	0.24
1,2,4-Trichlorobenzene	ppbv	0.53	<0.10
1,1,1-Trichloroethane	ppbv	1,100	<0.10
1,1,2-Trichloroethane	ppbv	0.30	<0.10
Trichloroethene	ppbv	0.37	<0.10
Trichlorofluoromethane (F11)	ppbv	9,900	0.14
1,1,2-Trichlorotrifluoroethane (F113)	ppbv	2,500	<0.10
1,2,4-Trimethylbenzene	ppbv	44	<0.10
1,3,5-Trimethylbenzene	ppbv	44	<0.10
Vinyl chloride	ppbv	0.62	<0.050
m,p-Xylene	ppbv	23	0.15
o-Xylene	ppbv	23	<0.10

Notes:

1) Residential Indoor Air Screening Levels were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013

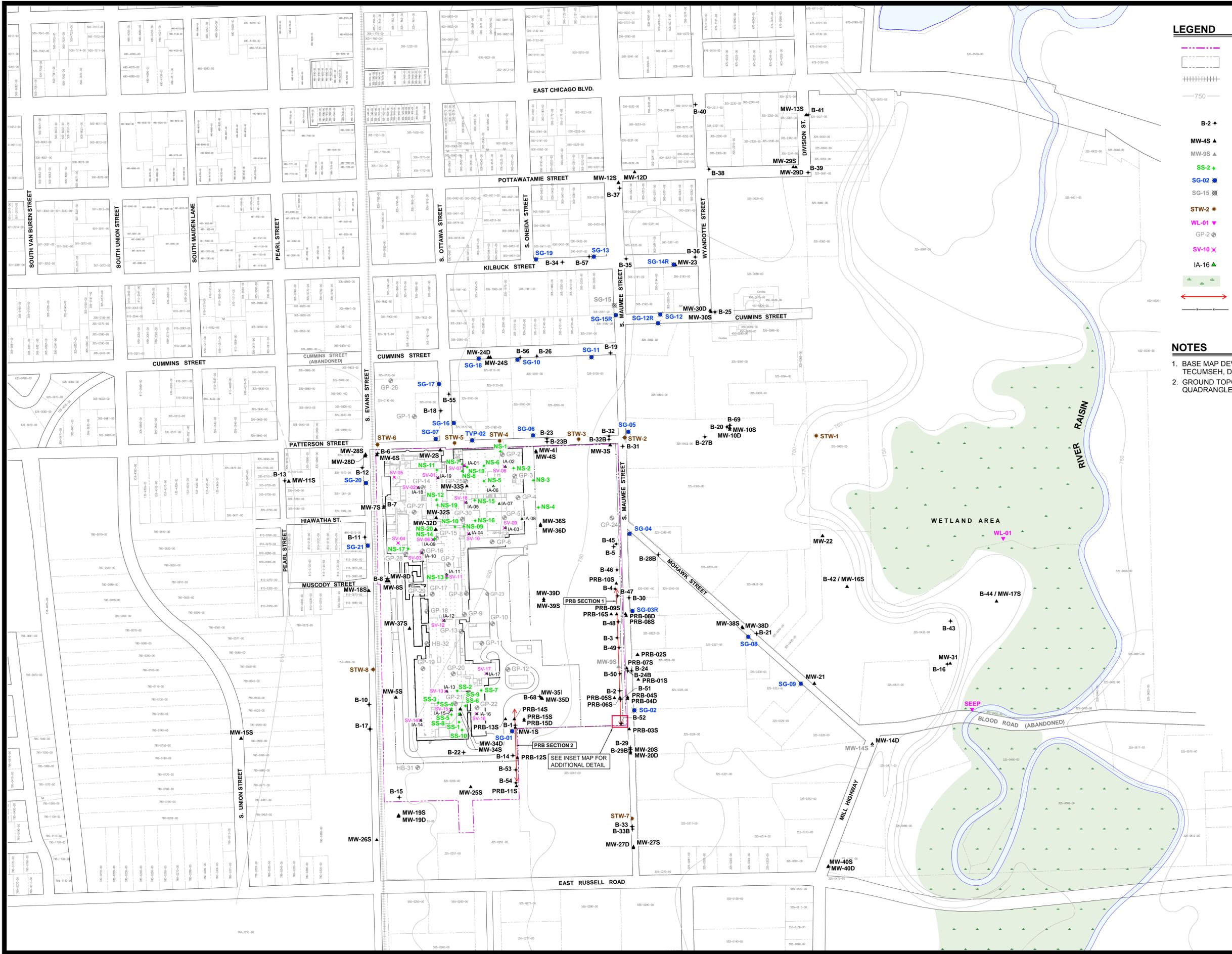
ppbv = parts per billion by volume

NC = No criterion

Bold font denotes concentrations detected above laboratory reporting limits

Figures

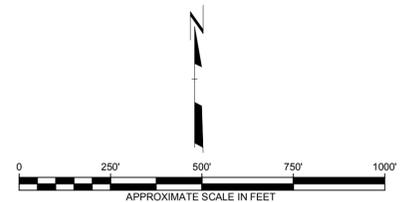
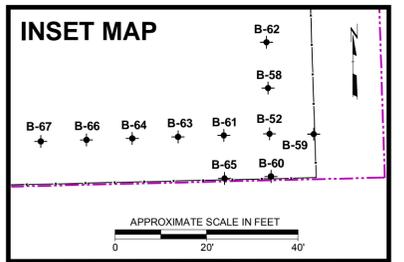
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 Drawing File Path: J:\TCI\Tecomseh Products\Tecomseh_MW040110001\Human Exp\040311_0001_03.01.dwg
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 Time: 10:50 AM
 Author: DGS
 Plot Date: 02/19/13
 Plot Time: 10:50 AM
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 Plot Scale: 1" = 400'
 Plot Orientation: Landscape
 Plot Title: FIG 01 Site ID & Samples



LEGEND

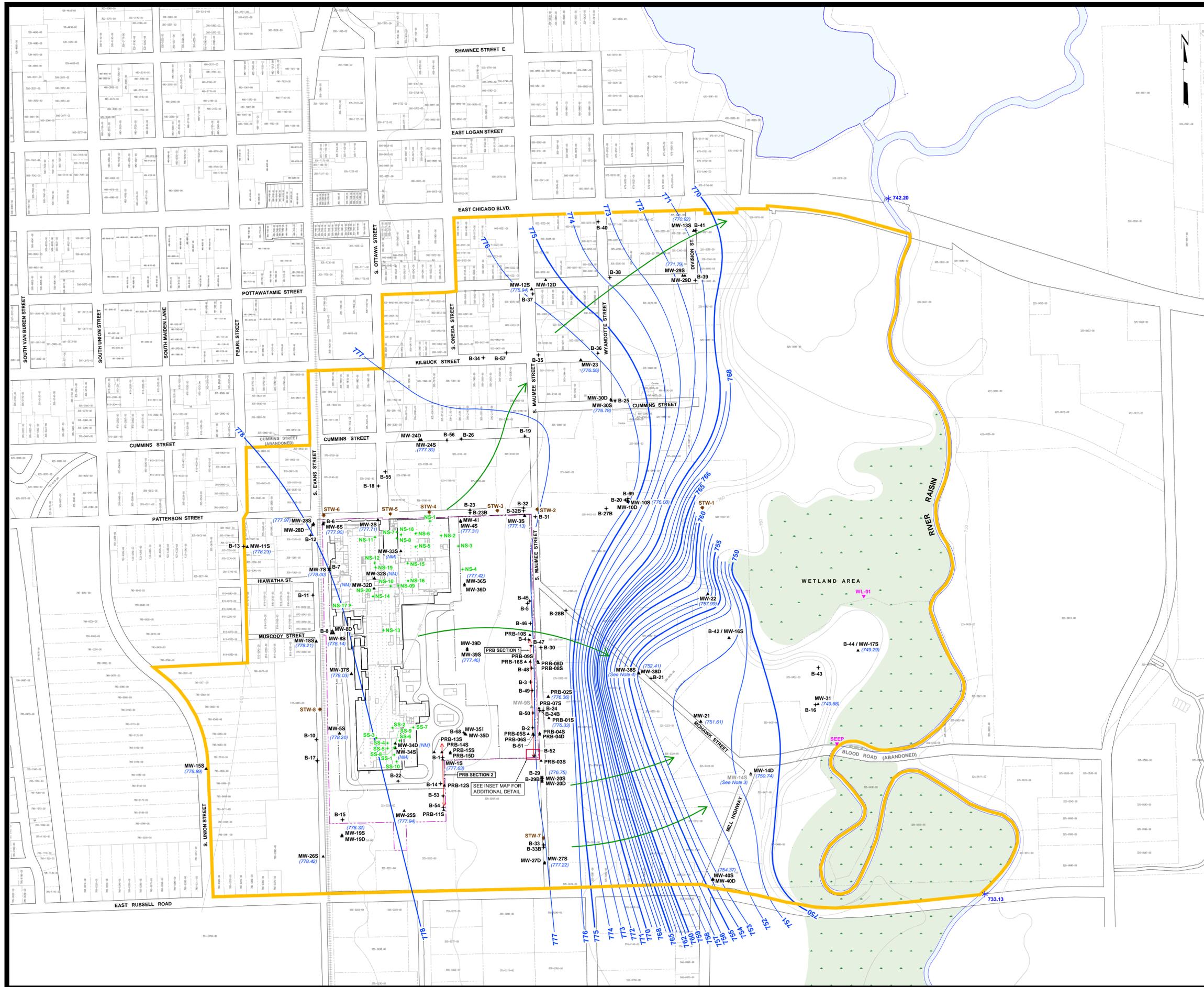
- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MONITORING WELL LOCATION AND NUMBER
- DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SOIL GAS SAMPLE LOCATION AND NUMBER
- DECOMMISSIONED SOIL GAS SAMPLE LOCATION AND NUMBER
- STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- APPROXIMATE SURFACE WATER SAMPLE LOCATION
- ATC PHASE II ESA BORING LOCATION AND NUMBER
- SUB-SLAB SOIL GAS SAMPLE NUMBER AND LOCATION
- INDOOR AIR SAMPLE NUMBER AND LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE

- ### NOTES
- BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
 - GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.



3					
2					
1	DGS	02/19/13	REVISED INVESTIGATION LOCATIONS		SEM
NO.	BY	DATE	REVISION		APPD.
FORMER TECUMSEH PRODUCTS SITE TECUMSEH, MICHIGAN					
SITE LAYOUT AND SAMPLE LOCATIONS					
DRAWN BY: DGS		SCALE: AS INDICATED		PROJ. NO: 192013.0000.02	
CHECKED BY: SEM		DATE PRINTED: JULY 2013		FILE NO: 004311.0001.03.01.dwg	
APPROVED BY: GC		FIGURE 1			
1540 Eisenhower Place Ann Arbor, MI 48108 Phone: 734.971.7080 Fax: 734.971.9022					

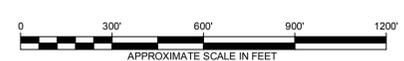
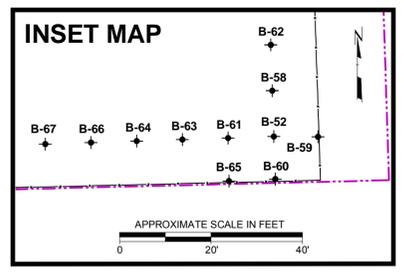
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 Date: 09/25/2013
 Time: 10:58 AM
 Plot Date: September 25, 2013
 Plot Time: 10:58 AM
 Layout: FIG03 GM Cont Map 2013 Apr
 Attached Xrefs: bta0101 (P)dwg
 Attached Images: Tecomseh NC



LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- B-2 +
- MW-4S ▲ MONITORING WELL LOCATION AND NUMBER
- MW-9S ▲ DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 + SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- 742.20 ✱ SURFACE WATER ELEVATION REFERENCE POINT
- STW-2 ▲ STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 ▲ APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE
- 770 — 5 FOOT GROUNDWATER CONTOUR LINE
- 771 — 1 FOOT GROUNDWATER CONTOUR LINE
- GROUNDWATER FLOW DIRECTION
- (780.26) GROUNDWATER / SURFACE WATER ELEVATION
- BOUNDARY OF AREA AFFECTED BY GROUNDWATER USE ORDINANCE

- ### NOTES
- BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
 - GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
 - MW-14S IS SCREENED IN A DIFFERENT, PERCHED, WATER BEARING UNIT THAN THE OTHER SHALLOW MONITORING WELLS ON-SITE. THE GROUNDWATER ELEVATION MEASURED AT MW-14D WAS USED TO DEVELOP GROUNDWATER CONTOURS, BECAUSE MW-14D IS SCREENED IN THE DEEPER WATER BEARING UNIT WHICH IS HYDRAULICALLY CONNECTED TO THE SITE.
 - DUE TO THE PRESENCE OF AN INTERMEDIATE CLAY LAYER UNDERLAIN BY A HIGHLY PERMEABLE SAND AND GRAVEL UNIT, THE AQUIFER IS BIFURCATED AT MONITORING WELL MW-38S/D. BOTH THE SHALLOW AND THE DEEP WELLS ARE HYDRAULICALLY CONNECTED TO THE SITE. THE WATER LEVEL IN THE DEEPER WELL, WHICH IS SCREENED IN THE HIGHER PERMEABILITY UNIT, WAS USED TO ILLUSTRATE GROUNDWATER CONTOURS AND HORIZONTAL GRADIENT ACROSS THIS AREA.



3					
2					
1	DGS	02/19/13	REVISED INVESTIGATION LOCATIONS		SEM
NO	BY	DATE	REVISION		APP'D
FORMER TECUMSEH PRODUCTS SITE TECUMSEH, MICHIGAN					
GROUNDWATER CONTOUR MAP APRIL 2013					
DRAWN BY:	DGS	SCALE:	AS INDICATED	PROJ. NO:	004311.0001.03
CHECKED BY:	SEM	FILE NO.:	004311.0001.03.03.dwg		
APPROVED BY:	GC	DATE PRINTED:			
DATE:	SEPTEMBER 2013		FIGURE 3		

Appendix A

Chronology of Remedial Investigation Activities and Corrective Measures

Chronology of Remedial Investigation Activities and Corrective Measures

Former Tecumseh Products Company Site
Tecumseh, Michigan

■ March 2009

- A perimeter groundwater investigation to determine whether VOCs had migrated off-site was conducted. The investigation included:
 - Installation of soil borings B-1 through B-8 for the collection of 13 grab groundwater samples for VOCs analysis; and
 - Installation of monitoring wells MW-01s through MW-09s. Specifically, the advancement of soil borings prior to well installation in order to evaluate site geology and depth to groundwater, well development, and completion of an initial groundwater sample event including collection of groundwater elevations and a groundwater sample for VOCs analysis from each monitoring well location.

■ April 2009

- An off-site subsurface investigation was conducted to help determine the horizontal and vertical extent COCs that had migrated off-site. The investigation included:
 - The advancement of 23 soil borings (B-10 through B-15, B-17 through B-26, and B-29 through B-35) using a Geoprobe®;
 - Visual classification of soils at 17 locations (B-13, B-14, B-18 through B-24, B-26, and B-29 through B-35) to evaluate site geology and depth to groundwater; and
 - Collection of one or more grab groundwater sample at each investigation location for VOCs analysis (42 total).
- An investigation of potential preferential migration pathways was conducted, including:
 - Collection of 5 additional grab groundwater samples (B-23b, B-24b, B-27b, B-28b, and B-32b) from the backfill surrounding the storm and sanitary sewer system using an air-knife; and
 - Collection of water samples from eight storm sewer locations (STW-01 through STW-08) adjacent to the site.

- An on-site sub-surface investigation to more completely define potential source areas, including:
 - The advancement of 18 soil borings (NS-01 through NS-10 and SS-01 through SS-08) using a Geoprobe®;
 - Visual classification of soils at nine locations (NS-01 through NS-04, NS-10 and SS-01 through SS-04) to evaluate site geology and depth to groundwater;
 - Collection of one or more grab groundwater sample at each investigation location for VOCs analysis (22 total); and
 - Collection of one or more soil sample at each investigation location, except NS-03 located outside the building footprint, for VOCs analysis (26 total).
- Completion of a second groundwater sample event at monitoring wells MW-01s through MW-09s, including the collection of groundwater elevations and groundwater samples for VOCs analysis.
- Because 1,4-dioxane can be used to stabilize 1,1,1-trichloroethane (1,1,1-TCA), it was considered a potential, previously unevaluated COC in the areas with TCA in soil and groundwater. Therefore, a subset of the soil, groundwater and storm sewer samples described above were also analyzed for 1,4-dioxane. The evaluation included the samples collected at 28 investigation locations.
- Samples were collected at the 5 potable private wells that were identified within the area potentially affected by off-site migration of VOCs. Note that at the owner's request, a sample was also collected at a well located outside the area of affected groundwater (3719 Mill Highway).

■ **May 2009**

- An off-site subsurface investigation was conducted to further define the horizontal and vertical extent COCs that had migrated off-site. The investigation included:
 - The advancement of soil borings at 5 locations (B-36 through B-41);
 - The installation of 6 shallow monitoring wells (MW-10s through MW-15s);
 - Visual classification of soils at each of the investigation locations to evaluate site geology and depth to groundwater; and
 - Collection of one or more groundwater sample at each investigation location for VOCs analysis (14 total).
- The private well located at 610 Mohawk Street was decommissioned and the property was connected to municipal water.

- **June 2009**
 - Collection of groundwater elevations at monitoring well locations for the development of a groundwater contour map.
- **July 2009**
 - Additional off-site subsurface investigation activities were conducted to further define the horizontal and vertical extent COCs that had migrated off-site. The investigation included:
 - The advancement of soil borings at 3 locations (B-42 through B-44);
 - The installation of 2 shallow monitoring wells (MW-16s and MW-17s, co-located with soil borings B-42 and B-43, respectively);
 - Visual classification of soils at each of the investigation locations in order to evaluate site geology and depth to groundwater; and
 - Collection of a groundwater sample at monitoring well MW-17s for VOCs analysis. Samples were not collected at other investigation locations because monitoring well MW-16s was dry, and no water was encountered at soil boring B-43.
- **August 2009**
 - A sample was collected at the private irrigation well identified within the area potentially affected by off-site migration of VOCs.
- **September 2009**
 - The Current Conditions Report (CCR) was submitted to USEPA. The CCR provided a summarize of the site history, a description field activities conducted to date, provided an analysis of the data collected, and summarized the remaining data gaps.
- **October 2009**
 - On October 27, 2009, Michelle Mullin from USEPA, Peter Quackenbush of MDEQ and project staff from TPC and TRC conduct a site visit.
 - The Sub-Slab Vapor Sampling Workplan to investigate on-site sub-slab soil gas was implemented, including:
 - Installation of at 18 sub-slab sample points (SV-01 through SV-18) throughout the former TPC manufacturing building; and
 - Collection of sub-slab soil gas samples in at each location for analysis of site specific CVOCs (tetrachloroethene [PCE]; trichloroethene [TCE], 1,1-dichloroethene [1,1-DCE], 1,2-cis-dichloroethene [cis-DCE], 1,2-trans-

dichloroethene [trans-DCE], vinyl chloride, 1,1,1-TCA, 1,1-dichloroethane [1,1-DCA], and 1,2-dichloroethane [1,2-DCA]) by USEPA Method TO-15.

■ **November – December 2009**

- Additional investigation activities were conducted to further evaluate the continuity and physical parameters of the aquifer and the clay confining unit, including:
 - Advancement of soil borings at nine locations (MW-10d, MW-18s, MW-19s/d, MW-20s/d, MW-21, MW-22, MW-23, MW-24s/d, and MW-25s), to evaluate the depth of clay around the perimeter of the area affected by VOCs in groundwater;
 - Collection of two undisturbed Shelby Tube samples from the clay confining unit for hydraulic conductivity testing;
 - Measurement of *in situ* hydraulic conductivity (slug tests) at eight locations (MW-14s, MW-19s, MW-19d, MW-20s, MW-20d, MW-23, MW-24s, and MW-24d); and
 - Collection and analysis of four soil samples for fraction organic carbon analysis. (Samples collected at well locations MW-10d, MW-23, MW-19s, and MW-19d).
- Additional investigation activities were also performed to further define the vertical and horizontal extent of COCs in groundwater migrating off-site, including:
 - Installation of 12 new monitoring wells (MW-10d, MW-18s, MW-19s, MW-19d, MW-20s, MW-20d, MW-21, MW-22, MW-23, MW-24s, MW-24d, and MW-25s) to evaluate the lateral and vertical extent of off-site contaminant migration in groundwater;
 - Collection and analysis of one “deep” grab groundwater sample at the location of MW-25s to confirm that VOCs were not present near the top of clay at this location; and
 - Collection of two additional groundwater samples (B-29b and B-33b) from the backfill surrounding the storm and sanitary sewer system using an air-knife to further assess the potential for preferential migration of VOCs along the public utility corridors.
- A complete water sample event was conducted, which included:
 - Measurement of groundwater elevations at all monitoring well locations and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from all monitoring well locations except MW-16s, which was dry, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;

- Analysis of all groundwater sample locations for VOCs, and analysis of a subset of groundwater samples for monitored natural attenuation (MNA) parameters (ferrous iron, chloride, nitrate, sulfate, and total organic carbon);
 - Collection and analysis of water from the storm sewer at two locations (STW-1 and STW-2) including photoionization detector (PID) screening of the air space; and
 - Collection and analysis of samples from the three private potable water wells located at properties along Mohawk Street, within the lateral extent of affected groundwater.

- **January 2010**
 - After reviewing groundwater data from the December 2009 sample event, TRC identified results from six new monitoring well locations (MW-11s, MW-19s, MW-20s, MW-20d, MW-21, and MW-23) which had the potential to affect decisions related to future investigation activities. A second groundwater sample was collected for VOCs analysis at these locations to confirm the December 2009 sample results.
 - Further investigation of the on-site volatilization to indoor air migration pathway, including:
 - Collection of a second round of soil gas samples at sub-slab sample location SV-01 through SV-18;
 - Collection of 8-hour composite indoor air samples at five locations (IA-01 through IA-05) within P-Building, which, at the time, had been targeted for occupation and use in the near future; and
 - Analysis of samples for site specific CVOCs (PCE; TCE; 1,1-DCE; cis-DCE; trans-DCE; vinyl chloride, 1,1,1-TCA, 1,1-DCA, and 1,2-DCA) by USEPA Method TO-15.

- **February 2010**
 - A ventilation test was conducted to quantify the effect of ventilation on indoor air quality in P-Building. The ventilation test included the collection of 8-hour composite indoor air samples at eight locations (IA-01 through IA-08) within P-Building. Samples were analyzed for site specific COCs by USEPA Method TO-15.

- **March 2010**
 - Further investigation of the on-site volatilization to indoor air migration pathway, including:

- Collection of a third round of soil gas samples at a subset of sub-slab sample locations (SV-02, SV-06, SV-11, SV-12, SV-15, and SV-16);
 - Collection of 8-hour composite indoor air samples at eleven locations (IA-09 through IA-19) within the secondary use area (the portion of the former manufacturing building which was targeted for incidental use, but not full-time occupation by Consolidated Biscuit Company, *i.e.* the bulk of the facility excluding P-Building and the TPC lease space); and
 - Analysis of samples for site specific CVOCs by USEPA Method TO-15.
- Additional investigation activities were performed to further define the vertical and horizontal extent of COCs in groundwater migrating off-site, including:
 - Advancement of soil borings at six locations, to evaluate the depth of clay around the perimeter of the area affected by VOCs in groundwater; and
 - Installation of 11 new monitoring wells (MW-12d, MW-14d, MW-26s, MW-27s, MW-27d, MW-28s, MW-28d, MW-29s, MW-29d, MW-30s, and MW-30d) to evaluate the lateral and vertical extent of off-site contaminant migration in groundwater.
- The first quarter 2010 water sample event was conducted. Note that monitoring well MW-26s was not installed until March 31, 2010, after this water sample event was conducted, and as such, was not included in this sample event. The first quarter 2010 sample event included:
 - Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 36 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs;
 - Collection and analysis of water from the storm sewer at two locations (STW-1 and STW-2) including PID screening of the air space; and
 - Collection and analysis of water from the private well located at 307 Kilbuck Street in the vicinity of affected groundwater. Note that this well only has an external spigot which was frozen during the December 2009 sample event, preventing sample collection at that time.
- **April 2010**
 - Completion of a supplemental water sample event, which included:
 - Measurement of the groundwater elevation at MW-26s;

- Collection of a groundwater sample from monitoring well MW-26s for measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) and VOCs analysis; and
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis.
 - The Preliminary Off-Site Soil Gas Sampling Workplan to investigate the volatilization to indoor air migration pathway was implemented, including:
 - Installation of 14 deep perimeter and off-site soil gas sample points (SG-01 through SG-14) throughout the area of affected groundwater, with sample locations bias to include perimeter locations (areas with the highest groundwater concentrations) and residential areas;
 - Collection of soil gas samples at each location, except SG-12 and SG-14 where water in the sample port prevented sample collection; and
 - Analysis of samples for site specific CVOCs (PCE; TCE; 1,1-DCE; cis-DCE; trans-DCE; vinyl chloride, 1,1,1-TCA, 1,1-DCA, and 1,2-DCA) by USEPA Method TO-15.
- **May 2010**
 - The second quarter 2010 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 37 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs, and analysis of a subset of groundwater samples for MNA parameters (ferrous iron, chloride, nitrate, and sulfate);
 - Collection and analysis of water from the storm sewer at two locations (STW-1 and STW-2) including PID screening of the air space; and
 - Collection and analysis of water from four private wells located at 307 Kilbuck Street, 607 Mohawk Street, 611 Mohawk Street, and 615 Mohawk Street.
- **June – July 2010**
 - Additional investigation activities were performed to further define the vertical and horizontal extent of COCs in groundwater migrating off-site, including:

- Advancement of one additional soil boring, to evaluate the depth of clay around the perimeter of the area affected by VOCs in groundwater; and
 - Installation of a new monitoring well (MW-31) at that location.
- Completion of a supplemental water sample event, which included:
 - Measurement of groundwater elevations at monitoring well MW-31 and at adjacent wells including MW-14d, MW-17s, MW-21, and MW-22 to support development of a groundwater contour map;
 - Measurement of surface water elevations at two points along the River Raisin;
 - Collection of a groundwater sample from monitoring well MW-31 for measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) and VOCs analysis; and
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis.
- A passive soil gas (PSG) survey was conducted by TRC and Beacon Environmental Services, Inc. (Beacon) to help identify point sources, if any within the northern source area. The PSG survey included:
 - Installation a grid of 150 PSG samplers spaced approximately 40 feet apart throughout the northern source area. PSG samplers were installed in holes, having a total depth of 30 inches, in the sub-slab;
 - Following installation, sample holes were sealed with a temporary aluminum foil plug and concrete patch to limit the influence of ambient air on sample results; and
 - Samplers, which contain an adsorbent medium to collect VOCs from the soil gas, were removed after the designated exposure period (approximately 1 week) and submitted to Beacon for VOCs analysis by USEPA Method 8260C.
- **August 2010**
 - A draft Quality Assurance Project Plan (QAPP) is submitted to USEPA for review.
- **September 2010**
 - Additional soil and groundwater investigation activities are performed to further define and evaluate on-site source areas, including:
 - Site reconnaissance based on PSG survey results to help select investigation locations;

- Advancement of soil borings at 10 locations (NS-11 through NS-17 and MW-32s through MW-34s) to evaluate site geology and depth to groundwater;
 - Collection of two soil samples at each boring location for VOCs analysis;
 - Collection of grab groundwater samples at 7 boring locations (NS-11 through NS-17); and
 - Installation and development of 3 new monitoring wells (MW-32s, MW-33s, and MW-34s) at source area locations.
- The third quarter 2010 water sample event was conducted, including:
- Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 40 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at those locations;
 - Analysis of all groundwater samples for VOCs;
 - Collection and VOC analysis of water from the storm sewer at two locations (STW-1 and STW-2) including PID screening of the air space; and
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis.
- Further investigation of the off-site groundwater volatilization to indoor air migration pathway was implemented, including:
- Installation of 2 additional off-site soil gas sample points (SG-15 and SG-16);
 - Collection of soil gas samples at each location, except SG-12, SG-14 and SG-15, where water in the sample port prevented sample collection;
 - Analysis of soil gas samples for site specific CVOCs by USEPA Method TO-15; and
 - Collection of a grab groundwater sample from the true water table at 1 boring location (B-35 [11-16']) for VOCs analysis.
- **October 2010**
- The third quarter 2010 groundwater sample from monitoring well MW-21, was not analyzed prior the end of its two-week hold time. A resample event was conducted at this location, and the sample was analyzed for VOCs.

- In response to a quality assessment of the September 2010 soil gas data, a resample event was conducted at four sample locations (SG-01, SG-02, SG-03, and SG-05). Samples were analyzed for site specific CVOCs as described above.
 - The irrigation well located at 509 South Maumee Street was decommissioned.
- **November 2010**
- A supplemental groundwater sample event was conducted at new source area monitoring wells (MW-32s, MW-33s, and MW-34s), which included:
 - Measurement of groundwater elevations at new well locations;
 - Collection of groundwater and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations; and
 - Analysis of groundwater samples for VOCs.
- **December 2010**
- Completion of the regular fourth quarter soil gas sample event, which included:
 - Collection of a soil gas sample at all soil gas sample point locations, except SG-02, SG-08, SG-14, and SG-15 where water in the sample point prevented sample collection; and
 - Analysis of soil gas samples by method TO-15 for the project specific list of CVOCs.
 - The fourth quarter 2010 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 39 monitoring well locations (monitoring well MW-09s could not be located due to snow cover) and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs, and analysis of a subset of groundwater samples for MNA parameters (ferrous iron, chloride, nitrate, and sulfate);
 - Collection and analysis of water from the storm sewer at one location (STW-1) including PID screening of the air space (flow at sample location STW-02 was insufficient to collect a sample);
 - Collection and analysis of water samples from four private wells located at 307 Kilbuck Street, 607 Mohawk Street, 611 Mohawk Street, and 615 Mohawk Street; and

- Note that the wetland area where surface water sample WL-01 is typically collected was frozen, so no sample was collected during this sample event.

■ February 2011

- The first quarter 2011 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 40 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs; and
 - Note that the wetland area where surface water sample WL-01 is typically collected was frozen, so no sample was collected during this sample event.
- Investigation activities to evaluate concentrations of VOCs and geochemical parameters in the shallow groundwater along the downgradient (eastern) perimeter of the site were conducted. Investigation activities included:
 - Advancement of soil borings at 12 locations to evaluate site geology and depth to groundwater (B-45 through B-54, PRB-01s, and PRB-02s);
 - Collection of two to three grab groundwater samples over a two-foot screened interval at 10 boring locations (B-45 through B-54);
 - Analysis of 27 groundwater samples for total VOCs;
 - Installation and development of two piezometers (PRB-01 and PRB-02) in the right-of-way on the east side of Maumee Street; and
 - In conjunction with regular quarterly groundwater sampling activities additional sample volume was collected at monitoring wells MW-01s and MW-09s for groundwater quality parameters which had not been measured previously at these locations, specifically calcium, iron, magnesium, manganese and total organic carbon.

■ March 2011

- Investigation activities to evaluate groundwater flow parameters along the downgradient (eastern) perimeter of the site were conducted. Investigation activities included:
 - Collection of groundwater elevations at five locations (MW-1s, MW-9s, MW-20s, PRB-01, and PRB-02); and

- Completion of *in-situ* hydraulic conductivity tests (slug tests) at four locations (MW-1s, MW-9s, MW-20s, and PRB-01) in order to assess hydraulic conductivity over the investigation area.
- Completion of the first quarter 2011 soil gas sample event, which included:
 - Collection of a soil gas sample at 11 of the 16 soil gas sample points (SG-01, SG-03, SG-04, SG-06, SG-07, SG-08, SG-09, SG-10, SG-11, SG-13, and SG-16). Water in the soil gas sample ports prevented sample collection at the remaining soil gas sample locations (SG-02, SG-05, SG-12, SG-14, and SG-15); and
 - Analysis of soil gas samples by method TO-15 for the project specific list of CVOCs.
- **April 2011**
 - Geoprobe® investigation activities were conducted to evaluate that nature and extent of aromatic petroleum hydrocarbon *i.e.* toluene, ethyl benzene and total xylenes in the vicinity of soil boring B-52 located near the southeast corner of the site. The investigation included:
 - Advancement of soil borings at ten on-site locations around soil boring B-52 to 12 feet below ground surface (ft-bgs) to evaluate site geology and depth to groundwater;
 - Collection of continuous soil samples at each soil boring location so that unsaturated soil could be screened with a PID equipped with a 10.6 eV lamp;
 - Collection of two soil samples at six soil boring locations for laboratory analysis (these six locations were located nearest the proposed trenched PRB);
 - Collection of one grab groundwater sample over a five-foot screened interval at each of the 10 boring locations; and
 - Analysis of 12 soil samples and 10 groundwater samples for benzene, toluene, ethylbenzene, and total xylenes (BTEX) compounds.
 - Completion of a soil gas resample event at sample location SG-01. The sample canister containing the sample collected in March 2011 was damaged in shipment and could not be analyzed. The sample was submitted to the laboratory of VOCs analysis by USEPA Method TO-15.

■ May 2011

- The second quarter 2011 water sample event was completed in May 2011, including:
 - Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 40 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs, and analysis of a subset of groundwater samples for MNA parameters (ferrous iron, chloride, nitrate, and sulfate); and
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis.
- A permeable reactive barrier (PRB) was installed to mitigate the potential off-site groundwater volatilization to indoor air migration pathway by treating shallow CVOC-affected groundwater. Installation activities are documented in the *Construction Documentation Report – Permeable Reactive Barrier Downgradient of the Southern Source Area*.

■ June 2011

- Completion of the second quarter soil gas sample event, which included two mobilizations:
 - The initial second quarter 2011 soil gas sample event was conducted on in early June following heavy rain in late May. Samples were collected at 7 of the 16 soil gas sample points (SG-01, SG-04, SG-06, SG-07, SG-11, SG-13, and SG-16). Water in the soil gas sample ports prevented sample collection at the remaining soil gas sample locations (SG-02, SG-03, SG-05, SG-08, SG-09, SG-10, SG-12, SG-14, and SG-15);
 - Given the high percentage of samples with water in the sample point during the initial sample event. A resample event was conducted in late June, at soil gas sample locations where water prevented sample collection during the initial second quarter soil gas sample event. Soil gas samples were collected at SG-02, SG-03, SG-05, and SG-08. Water in the soil gas sample ports prevented sample collection at the remaining soil gas sample locations (SG-09, SG-10, SG-12, SG-14, and SG-15); and
 - Analysis of soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.

■ **July 2011**

- The third quarter 2011 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations (including PRB-01s and PRB-02s), and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 39 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs;
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis; and
 - Note that MW-09s was excavated during PRB installation activities and is no longer included in the groundwater monitoring program.

■ **August 2011**

- The PRB performance monitoring network was installed and sampled as outlined in the Workplan Addendum to Install Additional PRB Performance Monitoring Wells, including:
 - Continuous soil sampling at each well/well nest location prior to well installation to evaluate depth to water and geology;
 - Installation of sixteen PRB monitoring wells (PRB-03s, PRB-04s, PRB-04d, PRB-05s, PRB-06s, PRB-07s, PRB-08s, PRB-08d, PRB-09s, PRB-10s, PRB-11s, PRB-12s, PRB-13s, PRB-14s, PRB-15s, and PRB-15d);
 - Completion of *in situ* hydraulic conductivity testing at the new PRB monitoring wells;
 - Measurement of groundwater elevations at all PRB monitoring well locations, including PRB-01s, PRB-02s, and the sixteen new monitoring wells;
 - Collection of groundwater samples at all 18 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations; and
 - Analysis of groundwater samples for VOCs and other PRB design parameters including chloride, sulfate, nitrate, calcium, iron, magnesium, manganese, and total organic carbon.

■ September 2011

- Completion of the third quarter 2011 soil gas sample event, which included:
 - Collection of a soil gas sample at 13 of the 16 soil gas sample points (SG-01, SG-02, SG-03, SG-04, SG-05, SG-06, SG-07, SG-08, SG-09, SG-10, SG-11, SG-13, and SG-16). Water in the soil gas sample ports prevented sample collection at the remaining soil gas sample locations (SG-12, SG-14, and SG-15); and
 - Analysis of soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- The Current Human Exposures Under Control Environmental Indicator Report was submitted to USEPA.

■ October 2011

- Completion of the installation and initial performance verification activities outlined in the *Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: 704 Mohawk Street*, dated May 2011 and revised September 2011, including collection of soil gas sample from the system exhaust.
- Completion of an initial crawl space sample event at four residential properties east of the site (610 Mohawk, 502 Mohawk, 505 South Maumee, and 507 South Maumee). Twenty-four hour samples were collected in 6-liter Summa® canisters for VOCs analysis by USEPA Method TO-15.
- The second quarter 2011 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations, and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 39 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs, and analysis of a subset of groundwater samples for MNA parameters (ferrous iron, chloride, nitrate, and sulfate); and
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis.
- Completion of the fourth quarter 2011 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at all 18 PRB monitoring well locations;

- Collection of groundwater samples at all 18 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 18 PRB groundwater samples for VOCs; and
 - Analysis of samples collected at shallow PRB monitoring locations downgradient of PRB Section 1 (PRB-01s, PRB-02s, PRB-04s, PRB-07s, and PRB-08s) for dissolved gasses (methane, ethane and ethylene).
 - Completion of the installation and initial performance verification activities outlined in the *Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: S-Building at 100 East Patterson Street*, including collection of indoor air sample to verify system performance.
 - Installation of passive vents adjacent to the trenched portion of the PRB to help ensure that methane does not accumulate in the subsurface during the winter when the ground is frozen, as documented in the *Construction Documentation Report – Permeable Reactive Barrier Downgradient of the Southern Source Area*.
- **November 2011**
- Completion of the fourth quarter 2011 soil gas sample event, which included:
 - Collection of a soil gas sample 15 of the 16 soil gas sample points. Water in the soil gas sample port prevented sample collection at the remaining soil gas sample location (SG-14); and
 - Analysis of soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
 - Measurement of methane concentrations at passive vent locations.
 - In accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: 704 Mohawk Street*, a performance verification sample event was conducted approximately 30-days after system installation.
 - Completion of a groundwater resample event at monitoring well MW-23 to confirm October 2011 VOC results.
- **December 2011**
- Measurement of methane concentrations at passive vent locations.
 - A pilot study was conducted to determine system design parameters for an active methane control system.
 - Private wells located at 607 Mohawk Street, 611 Mohawk Street, 615 Mohawk Street, and 704 Mohawk Street were decommissioned.

■ **January 2012**

- The first quarter 2012 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 39 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs; and
 - Collection of a surface water sample, WL-01, from the wetland area downgradient of the site for VOCs analysis.
- Completion of the first quarter 2012 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at all 18 PRB monitoring well locations;
 - Collection of groundwater samples at all 18 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 18 PRB groundwater samples for VOCs, iron, manganese, and sulfate; and
 - Analysis of samples collected at in-barrier, side gradient and downgradient PRB monitoring locations (all locations except PRB-05s and PRB-13s) for dissolved gasses and volatile fatty acids.
- An active methane ventilation system was constructed at vent locations V-01, V-02, and V-03. While awaiting connection of the permanent power supply, a generator was used to power a single blower during business hours.
- Completion of the first quarter 2012 soil gas sample event, which included:
 - Collection of a soil gas sample at 11 of the 16 soil gas sample points (SG-01, SG-02, SG-04, SG-06, SG-07, SG-08, SG-09, SG-10, SG-11, SG-13, and SG-16). Water in the soil gas sample ports prevented sample collection at the remaining soil gas sample locations (SG-03, SG-05, SG-12, SG-14, and SG-15); and
 - Analysis of soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- Measurement of methane concentrations and pressure at all vent locations.

■ **February 2012**

- A SSDV system inspection and indoor air sample event was conducted in accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/Ventilation System: S-Building at 100 East Patterson Street*.
- A SSDV system inspection was conducted in accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/Ventilation System: 704 Mohawk Street*.
- Permanent power was installed and the active methane ventilation system became fully functional.
- Completion of a groundwater resample event at monitoring well PRB-09s in order to confirm January 2012 VOC sample results at that location.
- Measurement of methane concentrations at all vent locations.

■ **March 2012**

- Measurement of methane concentrations at all vent locations.
- A project meeting was conducted at USEPA Region V Headquarters to discuss environmental work and upcoming report obligations. Meeting was attended by Michelle Mullin, Bhooma Sundar, David Petrovski, Mario Mangino, Colleen Olsburg, Daniel Mazur, and Susan Perdomo of USEPA; Jason Smith of TPC; Graham Crockford, John Rice and Stacy Metz of TRC; and Douglas McClure of Conlin, McKwney and Philbrick, PC.

■ **April 2012**

- Field activities as outlined in the *Workplan to Conduct a Pilot study to Facilitate the Design and Installation of a Full-Scale Soil Vapor Extraction System* were completed, including:
 - The installation of four soil vapor extraction points (SVE-01 through SVE-04), including the collection of two soil samples at each location;
 - The installation of temporary subsurface vacuum monitoring points at 14 locations (TVP-01s/d through TVP-14s/d);
 - The installation of SVE system piping;
 - System connection to a temporary positive displacement blower (blower skid rented from Proact);
 - Completion of stepped-rate tests and a constant rate-test to determine radius of influence, piping loss and other full-scale SVE system design parameters; and

- Collection of an exhaust sample from each on-site system (Pilot SVE system, S-Building SVE system, and the methane ventilation system) to evaluate system air permit requirements.
 - Pilot SVE system construction documented in the Full-Scale Soil Vapor Extraction System Design and Installation Workplan.
 - The second quarter 2012 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 39 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs, and analysis of a subset of groundwater samples for MNA parameters (ferrous iron, chloride, nitrate, and sulfate); and
 - Collection of surface water samples from the wetland area downgradient of the site (WL-01) and the seep near the former Blood Road bridge (SEEP) for VOCs analysis.
 - Completion of the second quarter 2012 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at all 18 PRB monitoring well locations;
 - Collection of groundwater samples at all 18 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 18 PRB groundwater samples for VOCs, iron, manganese, and sulfate; and
 - Analysis of samples collected at in-barrier and shallow downgradient PRB Section 1 monitoring locations (PRB-01s, PRB-02s, PRB-04s, PRB-06s, PRB-07s, PRB-08s, and PRB-09s) for dissolved gasses and volatile fatty acids.
- **May 2012**
 - Because SVE system exhaust concentrations have the potential to drop quickly, a second exhaust sample was collected from Pilot SVE system to confirm April 2012 sample results for the evaluation of SVE system air permit requirements.

- In accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/Ventilation System: 704 Mohawk Street*, a performance verification sample event was conducted approximately 180-days after system installation.
 - Completion of a second crawl space sample event at four residential properties east of the site (610 Mohawk, 502 Mohawk, 505 South Maumee, and 507 South Maumee). Twenty-four hour samples were collected in 6-liter Summa® canisters for VOCs analysis by USEPA Method TO-15.
- **June 2012**
- Field activities as outlined in the Full-Scale Soil Vapor Extraction System Design and Installation Workplan were completed, including:
 - The installation of three additional soil vapor extraction points (SVE-05 through SVE-07) and the associated SVE system piping;
 - System connection to the temporary positive displacement blower (blower skid rented from Proact);
 - Completion of stepped-rate tests and system balance; and
 - Note that Proact has been contracted to construct a permanent blower skid. A construction documentation report for the full-scale SVE will be prepared and submitted after the permanent blower is installed.
 - Measurement of methane concentrations and pressure at all PRB vent locations.
 - Additional soil gas investigation activities were conducted to further evaluate the potential for off-site vapor intrusion north and west of the site. Investigation activities included:
 - Advancement of soil borings at 8 locations to evaluate site geology and depth to groundwater;
 - Installation of 5 new soil gas monitoring points (SG-17, SG-18, SG-19, SG-20, and SG-21); and
 - Installation of 3 replacement soil gas monitoring points (SG-12R, SG-14R, and SG-15R) in the area northeast of the site.
 - Completion of the second quarter 2012 soil gas sample event, which included:
 - Sample collection at soil gas sample point locations installed in 2010 (SG-01 through SG-16), except for those locations where replacement sample points were installed in June 2012 (SG-12, SG-14, and SG-15);
 - Sample collection at all replacement soil gas sample point locations (SG-12R, SG-14R, and SG-15R);
 - Sample collection at new sample locations (SG-17 through SG-21);

- Sample collection at one exterior subsurface vacuum monitoring point (TVP-02s); and
 - Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
 - All remaining wells (8 total) within the area restricted by the groundwater use ordinance were decommissioned.
- **July 2012**
 - The third quarter 2012 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 40 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs; and
 - Collection of surface water samples from the wetland area downgradient of the site (WL-01) and the seep near the former Blood Road bridge (SEEP) for VOCs analysis.
 - Completion of the third quarter 2012 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at all 18 PRB monitoring well locations;
 - Collection of groundwater samples at all 18 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 18 PRB groundwater samples for VOCs, iron, manganese, and sulfate; and
 - Analysis of samples collected at in-barrier and shallow downgradient PRB Section 1 monitoring locations (PRB-01s, PRB-02s, PRB-04s, PRB-06s, PRB-07s, PRB-08s, and PRB-09s) for dissolved gasses.
 - Operation and maintenance of the SVE system, including collection of an exhaust sample.
- **August 2012**
 - Completion of investigation activities as outlined to the Workplan for Proposed Source Area Remedial Investigation Activities, which included:

- The advancement of 6 soil borings (NS-18, NS-19, NS-20, SS-9, SS-10 and MW-35d/B-68) to evaluate site geology, depth to groundwater and depth to the clay confining unit;
 - Visual classification of soils to at least 1 foot below the top of the clay confining unit;
 - Collection of PID readings;
 - Collection of three soil samples at each source area boring location (NS-18, NS-19, NS-20, SS-9, and SS-10) for VOC and TOC analysis;
 - Installation of three temporary wells (at the water table, in the intermediate aquifer and immediately above the clay) at each source area boring location;
 - Installation of three temporary wells (one at the water table and two in the intermediate aquifer and immediately above the clay) and one permanent well at boring location MW-35d/B-68;
 - Development of all wells;
 - Collection of groundwater samples at all 19 well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all groundwater samples for VOCs, and source area groundwater samples for TOC; and
 - Gamma logging was conducted in the deep well at each location to support visual classification and evaluate aquifer homogeneity.
- Measurement of methane concentrations at all PRB vent locations.
 - Operation and maintenance of the SVE system, including collection of a composite exhaust sample, as well as samples from each SVE header pipe (SVE Line 1 and SVE Line 2).
 - In response to USEPA comments, one additional up gradient PRB monitoring well (PRB-16s) was installed. The well was installed and sampled, in accordance with the methods described in the Workplan Addendum.
 - Continuous soil sampling was conducted prior to well installation to evaluate depth to water and geology;
 - The well was constructed to the target depth (screened 5 to 10 ft-bgs) using direct push technology; and
 - Collection of an initial groundwater sample for VOCs, iron, manganese and sulfate analysis.

■ **September 2012**

- Operation and maintenance of the SVE system.
- The Remedial Investigation and Groundwater Environmental Indicator Report was submitted to USEPA.

■ **October 2012**

- Completion of the third quarter 2012 soil gas sample event (rain in September resulted in project delay until the first week in October), which included:
 - Sample collection at soil gas sample point locations installed in 2010 and 2012 (SG-01 through SG-21), except for those locations where replacement sample points were installed in June 2012 (SG-12, SG-14, and SG-15);
 - Sample collection at replacement soil gas sample point locations (SG-12R and SG-15R);
 - A sample was attempted at soil gas sample point SG-14R. However due to low permeability soils, even after several hours of sample collection, an insufficient sample volume had been collected for analysis;
 - Sample collection at one exterior subsurface vacuum monitoring point (TVP-02s); and
 - Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- The fourth quarter 2012 water sample event was conducted, including:
 - Measurement of groundwater elevations at all monitoring well locations and surface water elevations at two points along the River Raisin;
 - Collection of groundwater from 41 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Collection of groundwater from 1 temporary monitoring well location [B-68 (20.7-22.7')] and measurement of field parameters at this location;
 - Analysis of all groundwater samples for VOCs, and analysis of a subset of groundwater samples for MNA parameters (ferrous iron, chloride, nitrate, and sulfate); and
 - Collection of surface water samples from the wetland area downgradient of the site (WL-01) and the seep near the former Blood Road bridge (SEEP) for VOCs analysis.
- Completion of the fourth quarter 2012 PRB performance groundwater sample event, which included:

- Measurement of groundwater elevations at all 19 PRB monitoring well locations;
 - Collection of groundwater samples at all 19 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 19 PRB groundwater samples for VOCs, total organic carbon, calcium, iron, manganese, magnesium, nitrate and sulfate; and
 - Analysis of samples collected at in-barrier and shallow downgradient PRB Section 1 monitoring locations (PRB-01s, PRB-02s, PRB-04s, PRB-06s, PRB-07s, PRB-08s, and PRB-09s) for dissolved gasses.
- Operation and maintenance of the SVE system, including installation of the permanent blower skid and carbon treatment system.
 - A project meeting was conducted at USEPA Region V Headquarters to discuss environmental work and USEPA comments on the Remedial Investigation and Groundwater Environmental Indicator Report. Meeting was attended by Joseph Kelly, Bhooma Sundar, David Petrovski, Mario Mangino, Colleen Olsburg, and Daniel Mazur, of USEPA; Graham Crockford and Stacy Metz of TRC; and Jason Smith of TPC.
- **November 2012**
- In accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/Ventilation System: 704 Mohawk Street*, a performance verification sample event was conducted approximately one year after system installation.
 - Completion of a third (final) crawl space sample event at four residential properties east of the site (610 Mohawk, 502 Mohawk, 505 South Maumee, and 507 South Maumee). Twenty-four hour samples were collected in 6-liter Summa® canisters for VOCs analysis by USEPA Method TO-15.
 - Weekly operation and maintenance of the SVE system, including:
 - Collection of SVE system influent and effluent samples approximately 48-hours after system start-up;
 - Installation of the permanent blower skid and carbon treatment system;
 - Collection of SVE system influent and effluent samples approximately 9-days after system start-up;
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for carbon change out; and
 - Installation of buck booster transformers and connection of the SVE skid to the permanent power supply.

- Completion of the fourth quarter 2012 soil gas sample event, which included:
 - Sample collection at soil gas sample point locations installed in 2010 and 2012 (SG-01 through SG-21), except for two locations where replacement sample points were installed in June 2012 (SG-14 and SG-15);
 - Sample collection at one replacement sample point location (SG-15R);
 - A sample was attempted at replacement soil gas sample point SG-12R. However water in the sample port prevented sample collection. Sample collection was subsequently attempted (and succeeded) at soil gas sample point SG-12;
 - A sample was attempted at soil gas sample point SG-14R. However due to low permeability soils, even after several hours of sample collection, an insufficient sample volume had been collected for analysis;
 - Sample collection at one exterior subsurface vacuum monitoring point (TVP-02s); and
 - Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- Measurement of methane concentrations and pressure at all PRB vent locations.
- **December 2012**
 - Preparation and submittal of a technical memorandum summarizing action items agreed to during the October 2012 project meeting.
 - Operation and maintenance of the SVE system, including:
 - Collection of SVE system samples (influent into each carbon vessel) immediately prior to carbon change out to evaluate carbon adsorption capacity;
 - Carbon change out (removal and replacement of carbon in carbon treatment system) in both lead and lag treatment vessels; and
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events.
 - Collection of an ambient air sample downwind of the SVE system exhaust.
 - Preparation and submittal of a technical memorandum summarizing proposed changes to the groundwater monitoring program.

■ **January 2013**

- Operation and maintenance of the SVE system, including:
 - Collection of SVE system samples to evaluate carbon adsorption capacity and usage;
 - Carbon change out (removal and replacement of carbon in carbon treatment system) in the lead treatment vessel. Note that following change out, system plumbing was adjusted such that the lag vessel became the lead vessel and the vessel with the new carbon became the lag vessel; and
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events.
- Preparation and submittal of a Supplemental Remedial Investigation Workplan.
- Measurement of vacuum pressure and methane concentrations at all PRB vent locations.

■ **February 2013**

- Operation and maintenance of the SVE system, including:
 - Completion of piping repairs at SVE-6;
 - Installation of protective bollards at SVE-6 and SVE-7;
 - Carbon change out (removal and replacement of carbon in carbon treatment system) in the lead treatment vessel. Note that following change out, system plumbing was adjusted such that the lag vessel became the lead vessel and the vessel with the new carbon became the lag vessel;
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events; and
 - Installation of an electrical conduit to house the power line from the main power drop to the electrical box on the SVE skid.
- Preparation and Submittal of a Revised Supplemental Remedial Investigation Workplan.
- Measurement of vacuum pressure and methane concentrations at all PRB vent locations.

■ **March 2013**

- The first quarter 2013 water sample event was conducted, including:
 - Collection of groundwater from 3 monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at those locations; and
 - Analysis of all groundwater samples for VOCs.
- Measurement of vacuum pressure and methane concentrations at all PRB vent locations.
- Completion of the first quarter 2013 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at 18 PRB monitoring well locations;
 - Collection of groundwater samples at all 19 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 19 PRB groundwater samples for VOCs; and
 - Analysis of samples collected at in-barrier and shallow downgradient PRB Section 1 monitoring locations (PRB-01s, PRB-02s, PRB-04s, PRB-06s, PRB-07s, PRB-08s and PRB-09s) for dissolved gasses.
- Operation and maintenance of the SVE system, including:
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events; and
 - Carbon change out (removal and replacement of carbon in carbon treatment system) in the lead treatment vessel. Note that following carbon change out, system plumbing was adjusted such that the lag vessel became the lead vessel and the vessel with the new carbon became the lag vessel.
- Completion of the first quarter 2013 soil gas sample event, which included:
 - Sample collection at soil gas sample point locations installed in 2010 and 2012 (SG-01 through SG-21), except for three locations where replacement sample points were installed in June 2012 (SG-12, SG-14, and SG-15);
 - Sample collection at one replacement sample point location (SG-15R);
 - A sample was attempted at replacement soil gas sample point SG-12R, and subsequently at soil gas sample point SG-12. Water in the sample port prevented sample collection at both sample points. No sample was collected;

- A sample was attempted at soil gas sample point SG-14R. However due to low permeability soils, even after several hours of sample collection, an insufficient sample volume had been collected for analysis;
 - Sample collection at one exterior subsurface vacuum monitoring point (TVP-02s); and
 - Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- In accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: 704 Mohawk Street*, a quarterly system inspection was conducted.
- Completion of investigation activities in general accordance with the *Supplemental Groundwater Investigation Workplan for the Former Tecumseh Products Company Site*, which included:
 - The advancement of 8 soil borings (B-69, MW-04i, MW-08d, MW-10, MW-36, MW-37, MW-38, MW-39, MW-40) to evaluate site geology, depth to groundwater, and depth to the clay confining unit;
 - Visual classification of soils to at least 2 feet below the top of the clay confining unit;
 - Field screening of unsaturated soils with a PID;
 - Field screening of saturated granular soils with the Color-Tec Method;
 - Installation of five permanent shallow wells at the water table (MW-36s, MW-37s, MW-38s, MW-39s, and MW-40s);
 - Installation of five permanent deep wells just above the top of the clay confining unit (MW-08d, MW-36d, MW-38d, MW-39d, and MW-40d);
 - Installation of one permanent intermediate depth well in the zone of highest contamination as indicated by field screening (MW-04i);
 - Conversion of one temporary well [B-68 (20.7-22.7')] which was installed in August 2012 to a permanent well (MW-35i);
 - Development of all new wells; and
 - Collection of a waste characterization sample, and analysis of that sample for pH, flashpoint, TCLP VOCs, TCLP SVOCs, and TCLP metals to support disposal of soil cuttings.
- **April 2013**
 - Met with USEPA on site to provide a facility tour and for a project discussion.

- Completion of the supplemental groundwater sample event, which included:
 - Measurement of groundwater elevations at compliance monitoring well locations;
 - Collection of groundwater samples at all 12 new monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at those locations; and
 - Analysis of all 12 groundwater samples for VOCs.
- Completion of a re-sample event at soil gas sample point SG-03 due to high levels of tracer in the sample. Re-sample event confirms problem with sample point integrity.
- **May 2013**
 - Plan of Action of Ongoing Environmental Work inside the facility building was submitted by TRC and approved by the City of Tecumseh.
 - Demolition permit issued by the City of Tecumseh.
 - Phase I demolition began on May 7, 2013.
 - TRC met with the demolition contractor (Site Prep) to locate interior monitoring locations and discuss safe access to monitoring points near the demolition area.
 - Soil gas sample point SG-03 abandoned and replaced.
 - Soil gas sample points SG-14 and SG-15 abandoned.
 - Soil gas sample point repairs completed at SG-02 and SG-17.
 - Monitoring well MW-14s abandoned.
 - Operation and maintenance of the SVE system, including:
 - Quarterly system inspection including flow and pressure measurements at each extraction well;
 - Collection of SVE system samples to evaluate carbon adsorption capacity and usage; and
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events.
 - Installation of well covers at interior monitoring and investigation locations (MW-32d, MW-34d, NS-18, NS-19, NS-20, SS-09, and SS-10).

- Completion of the second quarter 2013 soil gas sample event, which included:
 - Sample collection at soil gas sample point locations installed in 2010, 2012, and 2013 (SG-01 through SG-21), except for one location where replacement a sample point was installed in June 2012 (SG-12);
 - A sample was attempted at replacement soil gas sample point SG-12R, and subsequently at soil gas sample point SG-12. Water in the sample port prevented sample collection at both sample points. No sample was collected;
 - Sample collection at one exterior subsurface vacuum monitoring point (TVP-02s); and
 - Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- Measurement of vacuum pressure and methane concentrations at all PRB vent locations.
- In accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: 704 Mohawk Street*, a quarterly system inspection was conducted.
- **May - June 2013**
 - Completion of second quarter groundwater sampling activities which included:
 - Collection of groundwater samples at 43 monitoring locations, including all 5 interior monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at those locations;
 - Collection of surface water samples from the wetland area downgradient of the site (WL-01) and the seep near the former Blood Road bridge (SEEP); and
 - Analysis of the collected groundwater surface water samples for VOCs.
- **June 2013**
 - Completion of the second quarter 2013 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at all 19 PRB monitoring well locations;
 - Collection of groundwater samples at all 19 PRB monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 19 PRB groundwater samples for VOCs; and

- Analysis of samples collected at in-barrier and shallow downgradient PRB Section 1 monitoring locations (PRB-01s, PRB-02s, PRB-04s, PRB-06s, PRB-07s, PRB-08s, and PRB-09s) for dissolved gasses.
 - Due to data quality issues, a second quarter 2013 soil gas re-sample event was conducted, which included:
 - Sample collection at soil gas sample point locations SG-01, SG-10, SG-16, and SG-21; and
 - Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
 - Phase I demolition completed and inspected by City on June 24, 2013.
 - TRC met with the demolition contractor (Site Prep) to discuss removal/relocation of demolition debris and safe access for the passive soil gas survey.
- **July 2013**
 - A passive soil gas (PSG) survey was conducted by TRC and Beacon Environmental Services, Inc. (Beacon) to help identify point sources, if any within the southernmost portion of the building. The PSG survey included:
 - Installation a grid of 142 PSG samplers spaced approximately 40 feet apart throughout the southern building area. PSG samplers were installed in holes, having a total depth of 30 inches, in the sub-slab;
 - Following installation, sample holes were sealed with a temporary aluminum foil plug and concrete patch to limit the influence of ambient air on sample results; and
 - Samplers, which contain an adsorbent medium to collect VOCs from the soil gas, were removed after the designated exposure period (approximately 1 week) and submitted to Beacon for VOCs analysis by USEPA Method 8260C.
 - Operation and maintenance of the SVE system, including:
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events.
- **August 2013**
 - Completion of the third quarter 2013 soil gas sample event, which included:
 - Sample collection at soil gas sample point locations installed in 2010, 2012, and 2013 (SG-01 through SG-21);
 - Sample collection at one exterior subsurface vacuum monitoring point (TVP-02s); and

- Analysis of all soil gas samples by USEPA Method TO-15 for the project specific list of CVOCs.
- Completion of the third quarter 2013 PRB performance groundwater sample event, which included:
 - Measurement of groundwater elevations at all 19 PRB monitoring well locations;
 - Collection of groundwater samples at all 19 PRB monitoring well locations and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at these locations;
 - Analysis of all 19 PRB groundwater samples for VOCs; and
 - Analysis of samples collected at in-barrier and shallow downgradient PRB Section 1 monitoring locations (PRB-01s, PRB-02s, PRB-04s, PRB-06s, PRB-07s, PRB-08s, and PRB-09s) for dissolved gasses.
- Completion of the third quarter groundwater sample event, which included:
 - Collection of groundwater samples at 18 monitoring well locations, and measurement of field parameters (pH, conductivity, turbidity, temperature dissolved oxygen, and redox potential) at those locations; and
 - Analysis of all 18 groundwater samples for VOCs.
- Measurement of vacuum pressure and methane concentrations at all PRB vent locations and two downgradient soil gas sample points (SG-02 and SG-03).
- In accordance with the *Workplan for the Installation of a Sub-Slab Depressurization/ Ventilation System: 704 Mohawk Street*, a quarterly system inspection was conducted:
 - During the system inspection, the technician noted that the U-tube manometer was not working properly; and
 - A replacement U-tube manometer was purchased and installed as soon as possible.
- Operation and maintenance of the SVE system, including:
 - Quarterly system inspection including flow and pressure measurements at each extraction well;
 - Collection of SVE system samples to evaluate carbon adsorption capacity and usage;
 - Field measurement of trichloroethene concentrations in the carbon treatment system to determine appropriate timeline for future carbon change out events; and

- Variable frequency drive (VFD) adjustments reduce energy costs while maintaining system effectiveness.
- **September 2013**
 - Operation and maintenance of the SVE system, including:
 - Carbon change out (removal and replacement of carbon in carbon treatment system) in the lead and lag treatment vessel. Note that following carbon change out, system plumbing was adjusted such that the lag vessel became the lead vessel and the vessel with the new carbon became the lag vessel.
 - A passive soil gas (PSG) survey was conducted by TRC to help identify point sources, if any within the central portion of the building and to develop a correlation between north and south PSG survey data. The PSG survey included:
 - Installation a grid of 49 PSG samplers spaced approximately 40 feet apart throughout the central portion of the building, including 5 duplicate locations from the northern PSG and 5 duplicate locations from the southern PSG survey. PSG samplers were installed in holes, having a total depth of 30 inches, in the sub-slab;
 - Following installation, sample holes were sealed with a temporary aluminum foil plug and concrete patch to limit the influence of ambient air on sample results; and
 - Samplers, which contain an adsorbent medium to collect VOCs from the soil gas, were removed after the designated exposure period (approximately 1 week) and submitted to Beacon for VOCs analysis by USEPA Method 8260C.
 - *The Supplement to the Current Human Exposures Under Control Environmental Indicator Report* was submitted to USEPA.

Appendix B

COC Selection Rationale and Tabulated Analytical Data for Non-VOC Parameters

Table B1
Phase II ESA - Summary of Soil Borings, Evaluated Potential Environmental Concerns, Analytical Rational/Field Screening Results
Former Tecumseh Product Company Site
Tecumseh, Michigan

Boring/Sample ID ⁽¹⁾	Purpose of Boring Location and Potential Environmental Concern(s) ⁽²⁾	Soil and Groundwater Sample (where collected) Laboratory analysis	Rationale for Soil and/or Groundwater (where present) Sample Laboratory Analysis (based on potential environmental concern)	Rationale for Soil and/or Groundwater Sample Selected (based on Field Screening results for Laboratory Analysis)
GP-1 (3'-5' BGS)	Former foundry area	VOCs, SVOCs, Metals and/or PCBs	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) to 6 feet bgs
GP-2 (GW sample only)	Wire stripping and/or paint use	VOCs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Sampled groundwater at soil/groundwater interface
GP-3 (6'-8' bgs)	Wire stripping and/or paint use	VOCs, SVOCs/PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL
GP-4 (4'-6' bgs)	General area coverage	VOCs, PNAs, Metals and/or PCBs	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) and PID readings
GP-5 (GW sample only)	General area coverage	VOC, SVOCs, and/or Metals	Common indicator parameters for commercial/industrial Properties and processes	General site coverage with groundwater sampled at soil/groundwater interface
GP-6 (3'-5' bgs)	Suspected down gradient of former fuel oil tank	VOCs, SVOCs, Metals and/or PCBs	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments and PID readings
GP-7 (2'-4' bgs)	Foundry/paint line/oil house	VOCs, SVOCs, Metals, PCBs and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL (sand with slag) and PID readings
GP-8 (GW sample only)	Sump, trench/solvent use	VOCs, SVOC, Metals, PCBs and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Sampled groundwater at soil/groundwater interface
GP-9 (5'-7' bgs)	Sump, trench/solvent use	VOCs, PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL and PID readings
GP-10 (2'-4' bgs)	Suspected downgradient of large ASTs/new waste water treatment plant	VOCs, SVOCs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) and PID readings
GP-11 (GW sample only)	Downgradient of hazardous materials storage building (55-gallon drums, etc.)	VOCs, SVOCs, Metals and Cyanide	Common indicator parameters for commercial/industrial Properties and processes	General site coverage with groundwater sampled at soil/groundwater interface
GP-12 (5'-7' bgs)	Suspected down gradient and general site coverage	VOCs, SVOCs/PNAs, Metals, PCBs and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) and PID readings in vadose zone
GP-13 (GW sample only)	Paint lines and/or solvent use	VOCs, PNAs and Metals	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL and general site coverage with groundwater sampled at soil/groundwater interface
GP-14 (1'-3' bgs)	Former Foundry area and machining area	VOCs, SVOCs/PNAs, Metals and/or PCBs	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL with slag at the surface, PID readings and general site coverage
GP-15 (3'-5' bgs)	Former Foundry Area and paint line with possible solvent use	VOCs, SVOCs/PNAs, Metals and/or PCBs	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick and slag) at the surface, and PID readings
GP-16 (1'-3' bgs)	Old waste water treatment plant with trenching, sump and possible UST	VOCs, SVOCs, Metals, PCBs and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL and PID readings

Notes:

- 1) If a soil sample was collected, the soil sample depth is shown in parenthesis next to the sample ID. The groundwater samples were generally collected from the saturated zones immediately below the vadose zone. However in select borings, two groundwater samples were collected: one from the saturated zone immediately below the vadose zone and a second a deeper sample at the depth noted.
- 2) Each of the above borings were located for general site coverage in addition to the purpose listed above.

Table B1
Phase II ESA - Summary of Soil Borings, Evaluated Potential Environmental Concerns, Analytical Rational/Field Screening Results
Former Tecumseh Product Company Site
Tecumseh, Michigan

Boring/Sample ID ⁽¹⁾	Purpose of Boring Location and Potential Environmental Concern(s) ⁽²⁾	Soil and Groundwater Sample (where collected) Laboratory analysis	Rationale for Soil and/or Groundwater (where present) Sample Laboratory Analysis (based on potential environmental concern)	Rationale for Soil and/or Groundwater Sample Selected (based on Field Screening results for Laboratory Analysis)
GP-17 (3'-5' bgs)	Suspected down gradient of UST area and boiler room	VOCs, SVOCs/PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL at the surface, PID readings and site coverage
GP-18 (GW only)	Suspected down gradient of railroad tracks, drum storage and near staining in basement	VOCs, PNAs and/or Metals	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) and PID readings
GP-19 (GW sample only)	General coverage and down gradient of railroad tracks	VOCs, PNAs and Metals	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) and PID readings
GP-20 (no sample collected)	General coverage	No sample recovered	Common indicator parameters for commercial/industrial Properties and processes	Boring was terminated at a depth of about 6 feet bgs due to the presence of water main and no sample was collected
GP-21 (3'-5' bgs)	Suspected former solvent use/storage	VOCs, PNA and/or Metals	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL and PID readings
GP-22 (8'-10' bgs) GW sample at 26' & 45'	Suspected former solvent use/storage and downgradient of solvent use/storage	VOCs, SVOCs/PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. steel bolts) and PID readings
GP-23 (3'-5' bgs) GW sample at 26' & 35'	Suspected area of former hazardous waste storage area	VOCs, SVOCs/PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with slag and elevated PID readings
GP-24 (GW sample only)	Down gradient of site and at suspected downgradient site boundary	VOCs, SVOCs/PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled fill with debris (i.e. Brick fragments) at the surface and shallow water table
GP-25 (1'-2' bgs)	Dumpster/metal shavings storage area	VOCs, SVOCs, Metals, PCBs, and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Dark gray color of the soils beneath the surficial concrete and PID readings
GP-26 (3'-5' bgs)	Former foundry	VOCs, SVOCs, Metals and PCBs	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL with debris (i.e. brick fragments) and PID readings
GP-27 (1'-3' bgs)	Former foundry area and machining area	VOCs, SVOCs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments and slag) and PID readings in vadose zone
GP-28 (21'-23' bgs) GW sample at 26' & 45'	Reported former and closed-in-place UST area with suspected UST per GPR Survey	VOCs, PNAs, Metals and/or Cyanide	Common indicator parameters for commercial/industrial Properties and processes	Uncontrolled FILL with debris (i.e. brick fragments) and PID readings
GP-29 (3'-5' bgs)	Used oil and empty drum area and railroad tracks	VOCs, PNAs and Metals	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL and PID readings
GP-30 (boring refusal with no samples)	General coverage. No samples due to auger refusal	No samples collected due to refusal	NA	Boring was terminated at a depth of about 2 feet bgs due to refusal and no sample was collected
GP-31 (6-inches bgs) (soil only)	Missing/stressed vegetation	VOCs, PNAs and Metals	Common indicator parameters for commercial/industrial Properties and processes	Possible uncontrolled FILL and PID readings
GP-32 (6-inches bgs) (soil only)	Stressed vegetation and staining near electrical transformer	PCBs	Common indicator parameter for transformer oil	Possible uncontrolled FILL and PID readings

Notes:

- 1) If a soil sample was collected, the soil sample depth is shown in parenthesis next to the sample ID. The groundwater samples were generally collected from the saturated zones immediately below the vadose zone. However in select borings, two groundwater samples were collected: one from the saturated zone immediately below the vadose zone and a second a deeper sample at the depth noted.
- 2) Each of the above borings were located for general site coverage in addition to the purpose listed above.

Table B2
 Summary of 1,4-Dioxanes in On-Site Soil
 Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte		1,4-Dioxane ⁽²⁾
Residential DWP Criterion		1.7
Non-Residential DWP Criterion		7.0
GSI Protection Criterion		56 ⁽¹⁾
Residential DCC		530
Non-Residential DC Criterion		2,400
Units		ug/kg
NS-01 (0-4')	4/17/2009	<0.39
NS-01 (16-20')	4/17/2009	<0.25
SS-01(1-1.5')	4/15/2009	<0.32
SS-02 (8-12')	4/16/2009	<0.29
SS-02 (16-20')	4/16/2009	<0.29
SS-02 (16-20') Dup-01	4/16/2009	<0.32
SS-03 (8-12')	4/16/2009	<0.30
SS-03 (16-20')	4/16/2009	<0.35
SS-04 (8-12')	4/17/2009	<0.29
SS-04 (12-16')	4/17/2009	<0.30
SS-05 (3-4')	4/17/2009	<0.26
SS-05 (12-13')	4/17/2009	<0.30
SS-05 (20-21')	4/17/2009	<0.26
SS-06 (5-7')	4/17/2009	<0.34
SS-6 (5-7') Dup-02	4/17/2009	<0.40
SS-07 (21-22')	4/20/2009	<0.35
SS-08 (19-20')	4/21/2009	<0.33

Notes:

Drinking Water Protection (DWP) Criteria, Groundwater to Surface Water Interface Protection (GSIP) Criteria, and Direct Contact (DC) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

ug/kg = micrograms per kilogram

NC = No Criteria

NA = Not Analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

1) Criterion is not protective for surface water used as a drinking water source as described in footnote {X} of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

Table B3
 Summary of 1,4-Dioxane at Groundwater and Storm Water Sample Locations
 Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte		1,4-Dioxane ⁽²⁾
Residential DW Criterion		85
Non-Residential DW Criterion		350
GSI Criterion		2,800 ⁽¹⁾
Groundwater Contact Criterion		1.70E+06
Human Non-Cancer Value (Non-Drink)		3.20E+06
Human Cancer Value (Non-Drink)		2,800
Final Chronic Value		22,000
Aquatic Maximum Value		2.00E+05
Final Acute Value		3.90E+05
Units		ug/L
MW-01S (16-21')	4/20/2009	<25
MW-05S (25-30')	4/20/2009	<25
MW-09S (7-12')	4/20/2009	<25
MW-14S (4-9')	5/14/2009	<3.0
MW-17S (3-8')	7/23/2009	<3.0
SS-01 (24-28')	4/15/2009	<25
SS-01 (45-49')	4/15/2009	<25
SS-02 (20-24')	4/16/2009	<25
SS-02 (42-46')	4/16/2009	<25
SS-03 (20-24')	4/16/2009	<25
SS-04 (22-24')	4/17/2009	<25
SS-05 (22-26')	4/17/2009	<25
SS-06 (23-27')	4/17/2009	160
SS-07 (22-26')	4/20/2009	<25
SS-08 (23-27')	4/21/2009	38
STW-7	4/13/2009	<25
STW-8	4/13/2009	<25

Notes:

Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011. Human Non-Cancer Values (HNV), Human Cancer Values (HCV), Final Chronic Values (FCV), Aquatic Maximum Values (AMV) and Final Acute Values (FAV) from MDEQ Surface Water Assessment Rule 57 Water Quality Values, September 7, 2012.

ug/L = micrograms per liter

NC = No Criteria

Bold font denotes concentrations detected above laboratory reporting limits

 Denotes concentrations above one or more criteria

1) Criterion is not protective for surface water used as a drinking water source as described in footnote {X} of MDEQ Op Memo 1 Part 201, Attachment 1.

2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21

Table B4
 Summary of Detected Semi-Volatile Organic Compounds at On-Site Soil Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte		Ace-naphthalene	Anthracene	Benzo-(a)anthracene ⁽¹⁾	Benzo-(b)fluoranthene ⁽¹⁾	Benzo-(g,h,i)perylene	Benzo-(k)fluoranthene ⁽¹⁾	Benzo-(a)pyrene ⁽¹⁾	Chrysene ⁽¹⁾	Dibenzo-(a,h)anthracene ⁽¹⁾	Fluoranthene	Fluorene	Indeno-(1,2,3-cd)-pyrene ⁽¹⁾	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
DWP Criteria		5.9	41	NC	NC	NC	NC	NC	NC	NC	730	390	NC	57	35	56	480
GSIP Criteria		NC	NC	NC	NC	NC	NC	NC	NC	NC	5.5	5.3	NC	4.2	0.73	2.1	NC
Residential DC Criteria		1,600	2.30E+05	20	20	2,500	200	2.0	2,000	2.0	46,000	27,000	20	8,100	16,000	1,600	29,000
Non-Residential DC Criteria		5,200	7.30E+05	80	80	7,000	800	8.0	8,000	8.0	1.3E+05	87,000	80	26,000	52,000	5,200	84,000
Residential SVIAI Criteria		1,600	1.00E+06	NC	NC	NC	NC	NC	NC	NC	1.0E+06	5.80E+05	NC	2,700	250	2,800	1.00E+06
Non-Residential SVIAI Criteria		3,000	1.00E+06	NC	NC	NC	NC	NC	NC	NC	1.0E+06	1.00E+06	NC	4,900	470	5,100	1.00E+06
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
GP-01 (3-5')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-03 (6-8')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-04 (4-6')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-06 (3-5')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-07 (2-4')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-09 (5-7')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-10 (2-4')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-12 (5-7')	12/17/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-14 (1-3')	12/28/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-15 (3-5')	12/28/2008	<0.33	0.79	1.2	1.5	<0.33	0.51	1.2	1.5	<0.33	2.9	<0.33	<0.33	1.1	1.8	3.2	2.8
GP-16 (1-3')	12/28/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	1.4	1.5	1.2	<0.33
GP-17 (3-5')	12/28/2008	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-21 (3-5')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-22 (8-10')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-23 (3-5')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-25 (1-2')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-26 (3-5')	1/19/2009	<0.33	0.40	<0.33	0.50	<0.33	0.5	0.57	0.61	<0.33	2.3	<0.33	<0.33	<0.33	<0.33	1.5	1.7
GP-27 (1-3')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	--	--	--	<0.33	--	--
GP-28 (21-23')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
GP-29 (3-5')	1/19/2009	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
HB-31 (0-0.5')	2/4/2009	0.79	2.0	3.1	4.7	1.9	3.5	1.4	3.9	0.68	13	0.73	2.1	<0.33	<0.33	5.7	11

Notes:
 Drinking Water Protection (DWP) Criteria, Groundwater to Surface Water Interface Protection (GSIP) Criteria, Residential and Non-Residential Direct Contact (DC) Criteria and Residential and Non-Residential Soil Volatilization to Indoor Air Inhalation (SVIAI) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

mg/kg = milligrams per kilogram

NC = No Criteria

-- = Not Analyzed

Bold font denotes concentrations detected above laboratory reporting limits

 Denotes concentrations above one or more criteria

1) Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

Table B5
 Summary of Detected Semi-Volatile Organic Compounds at Source Area Grab Groundwater Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	2-Methylnaphthalene	Naphthalene
GSI Criteria	19	11
Residential DW Criteria	260	520
Non-Residential DW Criteria	750	1,500
Residential GVIAI Criteria	25,000	31,000
Non-Residential GVIAI Criteria	25,000	31,000
Groundwater Contact Criteria	25,000	31,000
Human Non-Cancer Value (Non-Drink)	1,000	2,300
Human Cancer Value (Non-Drink)	NC	NC
Final Chronic Value	19	11
Aquatic Maximum Value	170	100
Final Acute Value	340	200
Units	ug/L	ug/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft)	2-Methylnaphthalene	Naphthalene
GP-01 (26-30')	12/15/2008	25	<5	<5
GP-02 (20-24')	12/15/2008	23	<5	<5
GP-03 (20-24')	12/15/2008	23	<5	<5
GP-04 (25-29')	12/15/2008	23	<5	<5
GP-05 (25-29')	12/15/2008	23	<5	<5
GP-06 (25-29')	12/15/2008	23	<5	<5
GP-07 (25-29')	12/16/2008	23	<5	<5
GP-08 (26-30')	12/16/2008	27	7	10
GP-09 (25-29')	12/16/2008	27	<5	<5
GP-10 (20-24')	12/16/2008	19	<5	<5
GP-11 (20-24')	12/16/2008	20	<5	<5
GP-12 (20-24')	12/16/2008	19	<5	<5
GP-13 (25-29')	12/16/2008	25	<5	<5
GP-14 (25-29')	12/22/2008	24	<5	<5
GP-15 (20-24')	12/22/2008	23	<5	<5
GP-16 (25-29')	12/22/2008	24	<5	<5
GP-17 (25-29')	12/22/2008	23.5	<5	<5
GP-18 (20-24')	12/22/2008	22	<5	<5
GP-19 (25-29')	12/22/2008	22	<5	<5
GP-21 (20-24')	1/14/2009	23	<5	<5
GP-22 (22-26')	1/14/2009	22	<5	<5
GP-23 (22-26')	1/14/2009	19	<5	<5
GP-24 (10-14')	1/14/2009	8	<5	<5
GP-25 (25-29')	1/15/2009	22	<5	<5
GP-26 (25-29')	1/15/2009	25	<5	<5
GP-27 (25-29')	1/15/2009	24	<5	<5
GP-28 (22-26')	1/15/2009	23	<5	<5
GP-29 (22-26')	1/15/2009	23	<5	<5

Notes:

Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria, Groundwater Volatilization to Indoor Air Inhalation (GVIAI) Criteria and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

Human Non-Cancer Values (HNV), Human Cancer Values (HCV), Final Chronic Values (FCV), Aquatic Maximum Values (AMV) and Final Acute Values (FAV) from MDEQ Surface Water Assessment Rule 57 Water Quality Values, September 7, 2012.

ug/L = micrograms per liter

NC = No Criteria

Bold font denotes concentrations detected above laboratory reporting limits

Denotes concentrations above one or more criteria

Table B6
 Summary of Detected Metals at On-Site Soil Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte		Arsenic	Barium	Cadmium	Chromium ⁽¹⁾	Copper	Lead	Mercury	Selenium	Zinc
Statewide Default Background		5.8	75 ⁽²⁾	1.2 ⁽²⁾	18 ⁽²⁾	32 ⁽²⁾	21 ⁽²⁾	0.13 ⁽²⁾	0.41 ⁽²⁾	47 ⁽²⁾
DWP Criteria		4.6	1,300	6.0	30	5,800	700	1.7	4.0	2,400
GSIP Criteria		4.6	440	3.0 ⁽⁴⁾	3.3	7.5	250 ⁽⁴⁾	0.05	0.40	170
Residential DC Criteria		7.6	37,000	550	2,500	20,000	400	160	2,600	1.70E+05
Non-Residential DC Criteria		37	1.30E+05	2,100	9,200	73,000	900	580	9,600	6.30E+05
Residential SVIAI Criteria		NC	NC	NC	NC	NC	NC	48	NC	NC
Non-Residential SVIAI Criteria		NC	NC	NC	NC	NC	NC	89	NC	NC
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

GP-01 (3-5')	12/17/2008	5.7	65	0.83	7.1	12	11	<0.1	2.8	18
GP-03 (6-8')	12/17/2008	--	--	0.76	4.2	--	6.1	--	--	--
GP-04 (4-6')	12/17/2008	6.6	43	0.53	6.2	11	7.0	<0.1	3.5	13
GP-06 (3-5')	12/17/2008	5.8	160	1.3	15	89	55	<0.1	3.0	110
GP-07 (2-4')	12/17/2008	2.3	93	0.72	7.3	41	13	<0.1	0.23	100
GP-09 (5-7')	12/17/2008	3.8	70	0.93	5.6	14	16	<0.1	0.81	31
GP-10 (2-4')	12/17/2008	--	--	1.0	6.1	--	15	--	--	--
GP-12 (5-7')	12/17/2008	--	--	0.44	3.8	--	5.7	--	--	--
GP-14 (1-3')	12/28/2008	--	--	0.39	6.8	--	19	--	--	--
GP-15 (3-5')	12/28/2008	6.1	67	0.18	6.6	11	28	<0.1	2.8	32
GP-16 (1-3')	12/28/2008	14	16	1.5	7.8	6.2	49	<0.1	0.50	18
GP-17 (3-5')	12/28/2008	--	--	0.08	10	--	8.8	--	--	--
GP-21 (3-5')	1/19/2009	--	--	0.47	8.8	--	46	--	--	--
GP-22 (8-10')	1/19/2009	--	--	0.55	6.8	--	48	--	--	--
GP-23 (3-5')	1/19/2009	--	--	0.22	16	--	50	--	--	--
GP-25 (1-2')	1/19/2009	5.6	130	1.8	11	100	110	<0.1	1.2	160
GP-26 (3-5')	1/19/2009	--	--	0.39	11	--	89	--	--	--
GP-27 (1-3')	1/19/2009	8.3	260	6.6	16	110	170	0.11	1.8	260
GP-28 (21-23')	1/19/2009	--	--	0.34	4.7	--	27	--	--	--
GP-29 (3-5')	1/19/2009	--	--	1.0	11	--	140	--	--	--
HB-31 (0-0.5')	2/4/2009	--	--	9.0	24	--	110	--	--	--

Notes:

Statewide Default Background Levels, Drinking Water Protection (DWP) Criteria, Groundwater to Surface Water Interface Protection (GSIP) Criteria, Residential and Non-Residential Direct Contact (DC) Criteria and Residential and Non-Residential Soil Volatilization to Indoor Air Inhalation (SVIAI) Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011.

mg/kg = milligrams per kilogram

NC = No Criteria

-- = Not Analyzed

Bold font denotes concentrations detected above laboratory reporting limits

Green background Denotes concentrations above one or more criteria

1) If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI.

2) Background, as defined in R 299.5701 (b), may be substituted if higher than the calculated cleanup criterion.

3) GSIP criteria depends on water hardness. GSIP values were calculated in accordance with MDEQ Op Memo 5, using the recommended hardness value for Southern Lower Peninsula surface water of 150 mg/L.

4) Criterion is not protective for surface water used as a drinking water source as described in footnote (X) of MDEQ Op Memo 1 Part 201, Attachment 1.

Table B7
 Summary of Detected Metals at Source Area Grab Groundwater Sample Locations
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

Analyte	Barium	Copper	Cyanide ⁽¹⁾	Lead
Residential DW Criteria	2.0	1.0	0.20	0.004
Non-Residential DW Criteria	2.0	1.0	0.20	0.004
GSI Criteria	0.67	0.013	0.0052	0.016
Groundwater Contact Criteria	14,000	7,400	57	NC
Human Non-Cancer Value (Non-Drink)	160	38	48	0.19
Human Cancer Value (Non-Drink)	NC	NC	NC	NC
Final Chronic Value	0.67	0.013	0.0052	0.016
Aquatic Maximum Value	1.9	0.020	0.022	0.14
Final Acute Value	3.8	0.039	0.044	0.28
Units	mg/L	mg/L	mg/L	mg/L

Sample Location and Screen Interval	Sample Collection Date	Approx. Depth to Groundwater (ft)	Barium	Copper	Cyanide ⁽¹⁾	Lead
GP-01 (26-30')	12/15/2008	25	0.11	<0.004	--	<0.003
GP-02 (20-24')	12/15/2008	23	--	--	<0.1	<0.003
GP-03 (20-24')	12/15/2008	23	<0.1	0.006	<0.1	<0.003
GP-04 (25-29')	12/15/2008	23	--	--	<0.1	<0.003
GP-05 (25-29')	12/15/2008	23	<0.1	0.01	--	<0.003
GP-06 (25-29')	12/15/2008	23	--	--	<0.1	0.003
GP-07 (25-29')	12/16/2008	23	<0.1	<0.004	<0.1	<0.003
GP-08 (26-30')	12/16/2008	27	--	--	<0.1	<0.003
GP-09 (25-29')	12/16/2008	27	<0.1	<0.004	<0.1	<0.003
GP-10 (20-24')	12/16/2008	19	<0.1	0.011	<0.1	0.005
GP-11 (20-24')	12/16/2008	20	0.1	<0.004	<0.1	<0.003
GP-12 (20-24')	12/16/2008	19	<0.1	0.006	<0.1	<0.003
GP-13 (25-29')	12/16/2008	25	<0.1	0.008	--	0.003
GP-14 (25-29')	12/22/2008	24	--	--	--	<0.003
GP-15 (20-24')	12/22/2008	23	--	--	--	<0.003
GP-16 (25-29')	12/22/2008	24	<0.1	<0.004	0.005	<0.003
GP-17 (25-29')	12/22/2008	23.5	<0.1	<0.004	0.006	<0.003
GP-18 (20-24')	12/22/2008	22	--	--	--	<0.003
GP-19 (25-29')	12/22/2008	22	--	--	--	<0.003
GP-21 (20-24')	1/14/2009	23	--	--	--	<0.003
GP-22 (22-26')	1/14/2009	22	<0.1	<0.004	<1	<0.003
GP-23 (22-26')	1/14/2009	19	<0.1	<0.004	<1	<0.003
GP-24 (10-14')	1/14/2009	8	<0.1	<0.004	<1	<0.003
GP-25 (25-29')	1/15/2009	22	<0.1	<0.004	<1	<0.003
GP-26 (25-29')	1/15/2009	25	--	--	--	<0.003
GP-27 (25-29')	1/15/2009	24	<0.1	<0.004	<1	<0.003
GP-28 (22-26')	1/15/2009	23	--	--	<1	<0.003
GP-29 (22-26')	1/15/2009	23	--	--	--	<0.003

Notes:

Drinking Water (DW) Criteria, Groundwater/Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, March 25, 2011. Human Non-Cancer Values (HNV), Human Cancer Values (HCV), Final Chronic Values (FCV), Aquatic Maximum Values (AMV) and Final Acute Values (FAV) from MDEQ Surface Water Assessment Rule 57 Water Quality Values, September 7, 2012.

ug/L = micrograms per liter

NC = No criteria

-- = Not analyzed

Bold font denotes concentrations detected above laboratory reporting limits

 Denotes concentrations above one or more criteria

1) Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

Appendix C

TCE Groundwater Contact Criteria Calculations

Groundwater Contact Criterion Calculations for TCE

Former Tecumseh Products Company Site Tecumseh, Michigan

Purpose

During a March 2012 meeting with USEPA, Tecumseh Products Company (TPC) agreed to recalculate a site-specific groundwater contact criterion for the former TPC site located in Tecumseh, Michigan. The site-specific groundwater contact criterion reflects revised TCE toxicity data which was published by USEPA on September 28, 2011.

Background

Groundwater contact criteria are calculated to determine groundwater concentrations that are protective against adverse health effects due to long-term dermal exposure to hazardous substances in groundwater. The Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD) Operational Memorandum No. 1 Technical Support Document – Attachment 4: Part 201 Groundwater Contact Criteria was used as a guide to calculate a site-specific groundwater contact criterion for TCE using the most recent toxicity data published by the USEPA. The following calculations were used to derive a site specific Groundwater Contact Criteria for TCE of 13,000 ug/L, based on non-carcinogenic effects.

Target Receptor

Consistent with MDEQ guidance, the site-specific trichloroethene (TCE) groundwater contact criterion was derived to address potential human health risk from dermal (i.e., skin) exposure to hazardous substances in groundwater. Subsurface utility line repair, maintenance, and installation are the common types of activities that could result in periodic contact with hazardous substances in groundwater for any land use. Therefore, this criterion has been developed using the utility worker as the target receptor. Utility worker exposure to groundwater contaminants is likely to occur throughout the duration of their employment, resulting in a higher frequency of contact with contaminants than a construction worker whose exposure is likely to occur over a few months for only one year at a facility.

Pathway Relevance

The groundwater contact pathway is relevant for all land uses where contaminated groundwater is or will be encountered at a depth where construction or maintenance of utilities or other subsurface activities may reasonably be expected to result in persons coming into contact with the groundwater. The depth to groundwater is less than

15 feet in portions of the area of affected groundwater near the former TPC site; therefore, the groundwater contact pathway is relevant.

Calculations

For Carcinogenic Effects, groundwater contact criteria are calculated as follows:

$$GCC = \frac{BW \times AT_c \times TR \times CF_1}{SF \times SA \times SP \times EV \times EF \times ED \times CF_2} = 16,000 \text{ ug/L}$$

Where,

- n GCC = Groundwater Contact Criterion
- n BW = Body Weight = 70 kg (MDEQ default value)
- n AT_c = Averaging Time (Carcinogen) = 25,550 days (70 years)
- n TR = Target Risk Level = 10^{-5} (MDEQ default value)
- n SF = Oral Cancer Slope Factor = 0.046 (mg/(kg-day))⁻¹ (chemical specific value, revised 9/2011)
- n SA = Skin Surface Area – Adult = 3,300 cm² (MDEQ default value)
- n SP = Skin Penetration per Event = 0.0588 cm/event (Chemical Specific: calculated as described below)
- n EV = Event Frequency = 1 event per day (MDEQ default value)
- n EF = Exposure Frequency = 5 days/year (site specific value, see explanation below)
- n ED = Exposure Duration = 25 years (Conservative Worker Assumption)
- n CF_1 = Conversion Factor 1 = 1000 ug/mg
- n CF_2 = Conversion Factor 2 = 0.001 L/cm³

For Non-Carcinogenic Effects, groundwater contact criteria are calculated as follows:

$$GCC = \frac{THQ \times RfD \times BW \times AT_n \times CF_1}{SA \times SP \times EV \times EF \times ED \times CF_2} = 13,000 \text{ ug/L}$$

where,

- n THQ = Target Hazard Quotient = 1
- n RfD = Oral Reference Dose = 0.0005 mg/(kg-day)
- n AT_n = Averaging Time (Non-Carcinogen) = 9,125 days (25 years)

The more conservative site specific groundwater contact criterion for TCE is 13,000 ug/L, based on non-carcinogenic effects.

Determination of Skin Penetration (SP)

Skin Penetration (SP) is a function of the chemical's permeability coefficient (K_p) and Exposure Time (ET). Chemical-specific K_p values for organic hazardous substances are estimated using a refined Potts and Guy (1992) correlation equation (U.S. EPA, 2004). The correlation equation is a function of the K_{ow} and molecular weight (MW) and is based on an experimental database from Flynn (1990) for approximately 90 chemicals. The K_p values derived from this equation, presented below, were found to correlate reasonably well with experimentally determined K_p values.

$$\log K_p = -2.80 + (0.67 \times \log K_{ow}) - (0.0056 \times MW) = -1.72$$

where,

- n K_p = Permeability coefficient = chemical-specific (cm/hour)
- n $\log K_{ow}$ = Log of the Octanol-water partition coefficient = 2.71 (chemical-specific)
- n MW = Molecular weight = 131.39 g/mole (chemical-specific)

The equations used to estimate SP are as follows:

- n If $ET \leq t^*$, then

$$SP = 2 \times K_p \times \sqrt{\frac{6 \times \tau \times ET}{\pi}}$$

- n If $ET > t^*$, then

$$SP = K_p \times \left[\frac{ET}{1+B} + 2\tau \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

where,

- n t^* = Time to reach steady-state = chemical-specific (hours)
- n τ = Lag time = chemical-specific (hours)
- n ET = Exposure time = 2 hours
- n π = 3.141592654
- n B = Ratio of the K_p of the stratum corneum to the K_p of the viable epidermis = chemical-specific (dimensionless)

Calculate B:

$$B = K_p \times \left(\frac{\sqrt{MW}}{2.6} \right) = 0.0840$$

Calculate the chemical-specific diffusivity across the stratum corneum (D_{SC}):

$$D_{SC} = 10^{(-2.80 - 0.0056MW)} \times I_{SC} = 2.91 \times 10^{-7} \text{ cm}^2/\text{hour}$$

where,

n I_{SC} = Thickness of stratum corneum = 0.001 cm

Calculate lag time (τ) in hours:

$$\tau = \frac{I_{SC}^2}{6 \times D_{SC}} = 0.572 \text{ hours}$$

Calculate t^* :

n B is less than 0.6, therefore

$$t^* = 2.4 \times \tau = 1.37 \text{ hours}$$

Calculate SP:

n ET (2 hours) > t^* (1.37 hours), therefore

$$SP = K_p \times \left[\frac{ET}{1+B} + 2\tau \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right] = 0.0588 \text{ cm/event}$$

Determination of Site Specific Exposure Frequency (EF)

- n Depth to groundwater beneath the former manufacturing building (i.e. source areas) is approximately 20 feet. On-site utility workers are not expected to come into contact with affected groundwater.
- n In the vicinity of the former TPC site, public utilities may be submerged in the area of TCE-affected groundwater along a linear right-of-way length of 1,900 feet. See attached figure.
- n Given the miles of right-of-way with public utilities and the limited number of City of Tecumseh employees, TRC conservatively assumed the workers would spend no more than 1 work week (5 days) per year on average working in the area having both submerged utilities and TCE-affected groundwater.
- n The site specific exposure frequency is 5 days.

References

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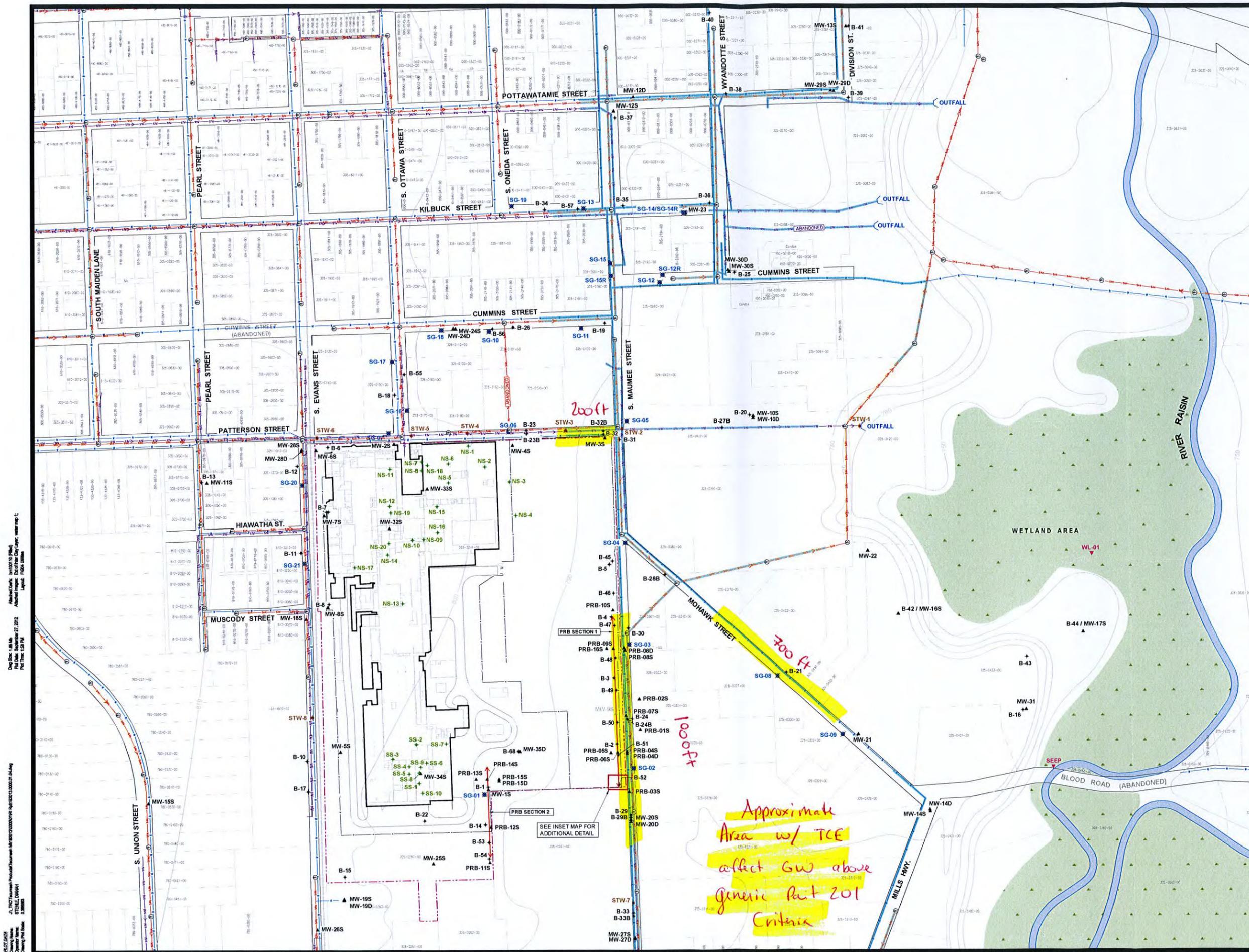
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Potts, R.O. and Guy, R.H. 1992. Predicting skin permeability. Pharmacol. Res. 9:663-669.

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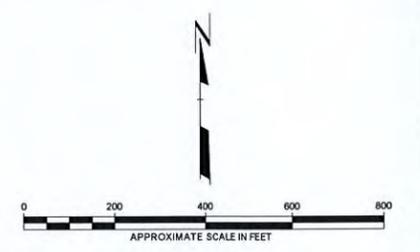
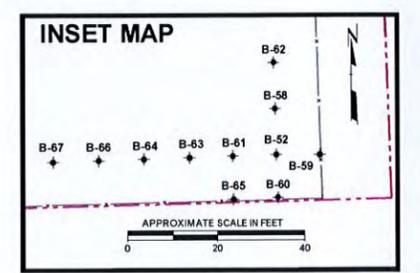
Prepared by: S. Metz

Reviewed by: D.VanAntwerp



- LEGEND**
- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
 - PARCEL BOUNDARY
 - ++++ RAILROAD TRACKS (APPROXIMATE LOCATION)
 - APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
 - B-2 + PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
 - MW-45 ▲ MONITORING WELL LOCATION AND NUMBER
 - MW-55 ▲ DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
 - SS-2 + SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
 - SG-02 ✕ SOIL GAS SAMPLE LOCATION AND NUMBER
 - STW-2 + STORM WATER SEWER SAMPLE LOCATION AND NUMBER
 - WL-01 ▼ APPROXIMATE SURFACE WATER SAMPLE LOCATION
 - ▲ FLOODPLAIN / WOODED WETLAND AREA
 - PRB LOCATION
 - FENCE LINE
 - WATER LINE (SEE NOTE 3)
 - SANITARY SEWER (SEE NOTE 3)
 - STORM SEWER (NOTE 3)
 - MANHOLE

- NOTES**
1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
 2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
 3. BLUE HIGHLIGHTING INDICATES APPROXIMATE LOCATIONS WHERE UTILITY CORRIDOR IS SATURATED.



NO.	BY	DATE	REVISION	APPD.
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2				
1				
PROJECT: FORMER TECUMSEH PRODUCTS SITE TECUMSEH, MICHIGAN				
TITLE: MAJOR UTILITY LOCATIONS				
DRAWN BY	S.L.D.G.S.	SCALE	PRJ. NO.	192012.0000.01
CHECKED BY	SM	AS INDICATED	FILE NO.	192019.0000.01.04.dwg
APPROVED BY	GC	DATE PRINTED	FIGURE 4	
DATE	SEPTEMBER 2012			
			1540 Eisenhower Place Ann Arbor, MI 48108 Phone: 734.971.7080 Fax: 734.971.9022	

A3/7/2012
 15 192019.0000.01.04.dwg
 Drawing File Name: 192019.0000.01.04.dwg
 Drawing File Size: 2,305,983
 Date: 9/11/2012 1:59 PM
 Plot Date: September 27, 2012
 Plot Time: 1:59 PM
 Plot Scale: 1:1
 Plot Color: Color
 Plot Style: None

Appendix D

Groundwater Use Evaluation and Corrective Measures Documentation

CITY OF TECUMSEH

AN ORDINANCE TO AMEND CHAPTER 82 UTILITIES ARTICLE IV. WATER SUPPLY SYSTEM OF THE TECUMSEH CITY CODE OF ORDINANCES TO PROHIBIT PRIVATE WATER WELLS WITHIN THE CITY OF TECUMSEH CITY, REQUIRE CONNECTION TO THE MUNICIPAL WATER SYSTEM WHEN SERVICE IS WITHIN 250 FEET, PROVIDE EXCEPTIONS FOR CURRENT WATER WELLS AND PROVIDE PENALTIES FOR VIOLATIONS.

THE CITY OF TECUMSEH ORDAINS:

1. Article IV. City Water Utility Section 82-120 shall be added to read as follows:

Sections 82-120. Private Water Wells

- (1) Definitions. The following definitions shall apply in the interpretation of this Section:
 - (a) "Applicant" means a person who is applying under Section 13 of this Ordinance for an addition or modification to a restricted zone.
 - (b) "Construction site dewatering" means temporary removal of ground water from an excavating site.
 - (c) "Owner" means the person holding the legal or equitable title to real property or a lesser estate therein, a mortgagee or vendee in possession, an assignee of rents, receiver, executor, trustee, lessee or any other person, firm or corporation directly or indirectly in control of a building, structure or real property or his duly authorized agent.
 - (d) "Person" means any individual, partnership, corporation, limited liability company, association, organization or other legal entity.
 - (e) "City" means the City of Tecumseh.
 - (f) "City water service" means the water supplied by the City of Tecumseh.
 - (g) "Water well" means a hole drilled or bored into the earth for the purpose of removing water through mechanical or non-mechanical means.
 - (h) "Restricted zone" is the area depicted on Figure I, prepared by RMT and dated March 2010, which accompanies this Ordinance, and any other areas so designated pursuant to Section 13 of this Ordinance.
- (2) Purpose. The purpose of this Ordinance is to protect public health, safety and welfare by preventing public exposure to an area of likely or known groundwater contamination.
- (3) Private Water Wells Prohibited. Except as provided in Subsection (4), no person shall install, construct, develop, maintain or use a water well within a restricted zone.

- (4) Permitted Water Wells. The following water wells are not prohibited by this Ordinance:
- (a) A water well used solely for the purpose of construction site dewatering or for conducting response activities, including sampling or treatment of the groundwater, provided that: (i) prior notice of the well is given to the City Manager, (ii) the Owner has demonstrated to the City Manager's satisfaction that the use of the well will not result in exposure to contaminated groundwater, possible cross-contamination between zones of groundwater, or hydrogeological effects on contaminated groundwater plumes, and (iii) the water generated by the well is properly handled and disposed of in compliance with all applicable laws, rules, regulations, permit and license requirements, orders and directives of any governmental entity or agency of competent jurisdiction.
 - (b) Municipal wells operated by the City for its municipal water supply, provided such wells are subject to groundwater monitoring under the oversight of the Michigan Department of Natural Resources and Environment Drinking Water and Radiological Protection Division, and/or its successor agency or designee, in accordance with Act 399 of 1976, The Michigan Safe Drinking Water Act, and applicable Administrative Rules promulgated thereunder.
 - (c) A geothermal type well for non-contact heating, cooling or processing activities, provided the well is a closed-loop design which does not allow fluid in the coils to be in direct contact with the subsurface, and further provided that Owner has demonstrated to the City Manager's satisfaction that the closed loop system and associated wells will not penetrate a confining clay layer and will be constructed and grouted in accordance with relevant construction criteria.
- (5) Large Capacity Wells. No well may be installed or used at any place in the City if its use will cause the migration of contaminated groundwater into previously unaffected groundwater, or will adversely affect any groundwater treatment system, unless the well is part of an MDEQ or US EPA approved groundwater monitoring or remediation system.
- (6) Connection to City Water Service Required. The owner of any house, building, or property used for human occupancy, employment, recreation, or other purposes situated within the restricted zone or who is prohibited from installing a well by Section 3(b) of this Ordinance, is hereby required at his or her expense to install suitable plumbing facilities therein, in accordance with the plumbing codes then in effect and enforced within the City and to connect such facilities directly with the City water service in accordance with the requirements of the City of Tecumseh City Code of Ordinances.

- (7) Existing Wells. Any existing well, the use of which is prohibited by Section 3(a), except as permitted under Section 4, shall be plugged or abandoned in conformance with Rules established by the Michigan Department of Environmental Quality ("MDEQ") and applicable Lenawee County Ordinance and Regulation.
- (8) Violations. Any person who violates any provision of this Section shall be responsible for a municipal civil infraction as defined in Public Act 12 of 1994, amending Public Act 236 of 1961, being Sections 600.101-600-9939 of Michigan Compiled Laws, and shall be subject to a fine of not more than Five Hundred and 00/100 (\$500.00) Dollars. Each day this Section is violated shall be considered a separate violation.
- (9) Enforcement Officials. The City Manager is authorized to issue municipal civil infraction citations.
- (10) Nuisance Per Se. A violation of this Section is hereby declared to be a nuisance per se and is declared to be offensive to the public health, safety and welfare.
- (11) Civil Remedies. In addition to enforcing this Section through the use of a municipal civil infraction proceeding, the City may initiate proceedings in the Circuit Courts to abate or eliminate the nuisance per se or any other violation of this Section.
- (12) Severability. If any provision of this Section or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect any remaining portion or application of this Section which can be given effect without the invalid portion or application.
- (13) Amendments. The City shall notify the MDEQ at least thirty (30) days prior to adopting a modification to this Ordinance or the lapsing or revocation thereof, including any modification to add to or remove property from a restricted zone.
- (14) Additions or Modifications to Restricted Zone.
 - (a) Removing Property from Restricted Zone.
 - (i) An owner of property located in the City within a restricted zone may apply to the City to remove property from the restricted zone upon a demonstration that such property need not be included in the restricted zone because of improved conditions in the affected groundwater.

(ii) The Application must include the MDEQ's written and specific concurrence with the requested action, as well as all documentation on which MDEQ based its concurrence.

(iii) The Application must be accompanied by payment of an application fee established by resolution of the City Council, intended to cover the City's anticipated out-of-pocket expenses to review and respond to the Application.

(b) Adding Property to or Establishing a Restricted Zone.

(i) Property may be added to a restricted zone or a new restricted zone established on a case-by-case basis following the procedures set forth in this section. An Applicant shall file an Application with the City to add property to a restricted zone or establish a new restricted zone. The Applicant shall include a fee established by resolution of the Council, intended to cover the City's anticipated out-of-pocket expenses to review and respond to the Application. The Application shall describe the proposed location to be added, and the nature of the proposed use restrictions.

(ii) The Applicant shall include all documentation submitted to the MDEQ, along with a written statement from a MDEQ representative with approval authority stating that the proposed restricted zone and use regulations have received MDEQ approval as part of the response actions for groundwater contamination.

(iii) The Applicant shall include notices provided to the Lenawee County Health Department concerning the property, and the Health Department's written acknowledgment that it will not issue permits for prohibited wells within the property to be added to the restricted zone.

(c) Council Action.

(i) Once the City Manager or his or her designee is satisfied that a restricted zone application is complete, the City Manager shall place the matter on the City Council agenda for a public hearing.

(ii) After the City Council sets the public hearing, the City Manager or his or her designee shall cause a written notice of the hearing to be sent by first class mail to all persons having an interest as owner, tenant, easement holder or mortgagee in any property included in the Application. The notice shall describe the Application and identify its main features and potential impact on the recipients. The notice shall be mailed at least ten (10) days, but not more than twenty (20) days, prior to the date of the hearing. The notice shall also be mailed to the appropriate MDEQ representatives.

(iii) After the public hearing, the City Council shall act on the application within thirty (30) days, unless it determines that it needs more information before it can decide. In that case, it shall act on the application within thirty (30) days after it has received the additional information.

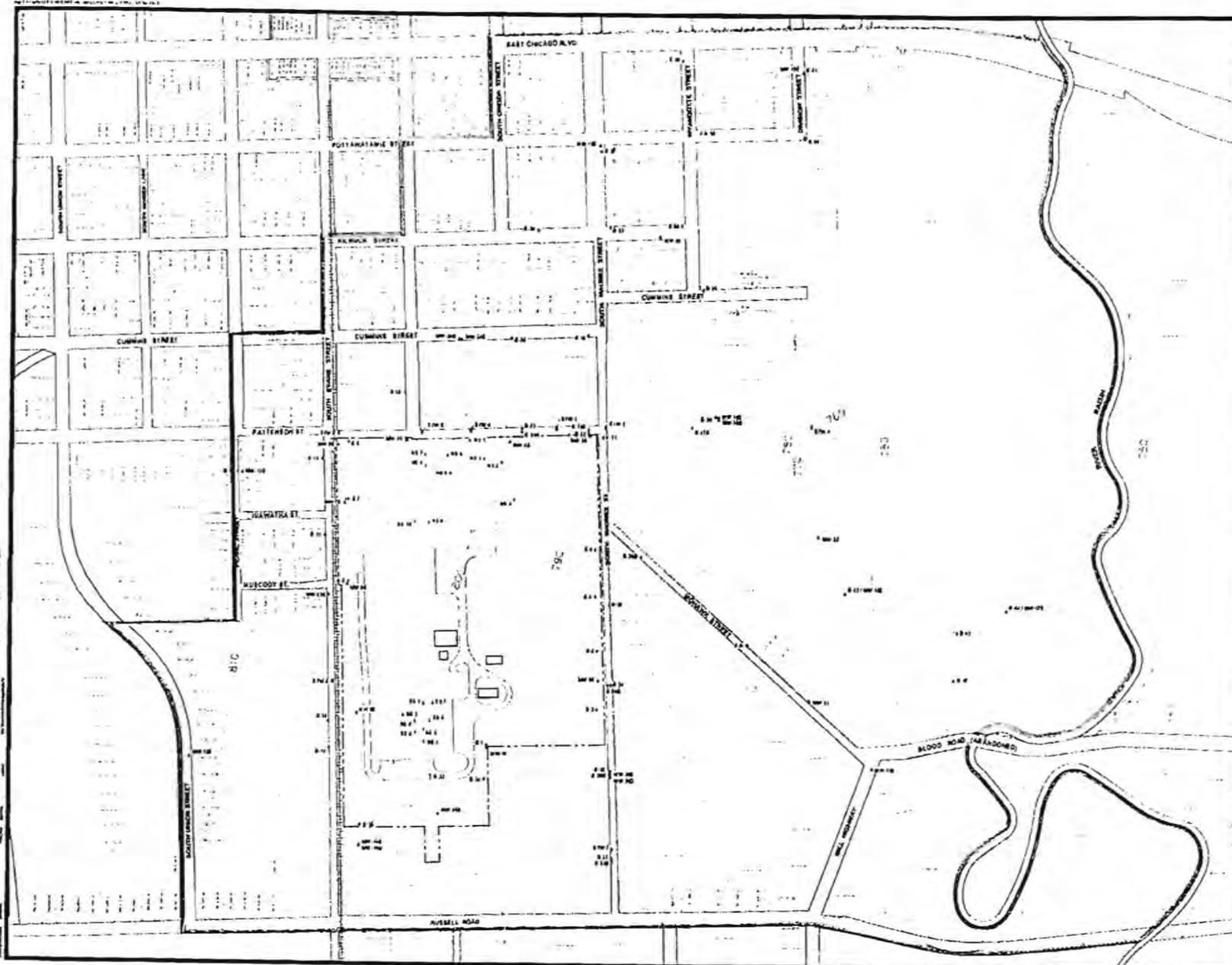
(iv) Within 10 days of City Council action modifying the restricted zone, the Applicant shall cause a notice of the City Council action to be recorded with the Lenawee County Register of Deeds, in a form approved by the City, and recorded in a manner designed to insure that it serves as record notice of the City Council action with respect to all affected premises within the restricted zone.

(v) Within 30 days of recording the notice, Applicant shall provide the City Clerk, the Lenawee County Health Department, and the MDEQ with copies of the recorded notice.

2. Effective Date and Recording. This ordinance shall be effective upon publication. This ordinance shall be filed with the Lenawee County register of deeds as an ordinance affecting multiple properties. The City shall provide notice to the Lenawee County Health Department containing a copy of this Ordinance.

This ordinance declared adopted on the _____ day of _____, 2011.

3403116_5.DOC



- LEGEND**
- Proposed Restricted Area
 - Former Restricted Area
 - Proposed 100' Buffer Zone
 - Proposed 50' Buffer Zone
 - Proposed 25' Buffer Zone
 - Proposed 10' Buffer Zone
 - Proposed 5' Buffer Zone
 - Proposed 2' Buffer Zone
 - Proposed 1' Buffer Zone
 - Proposed 0.5' Buffer Zone
 - Proposed 0.25' Buffer Zone
 - Proposed 0.125' Buffer Zone
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 - Proposed 0.001401298464324876171875000471116357421875000000005926327419387657739434765625' Buffer Zone
 - Proposed 0.00070064923216243808593750023555817871093750000000296316370969387657739434765625' Buffer Zone
 - Proposed 0.00035032461608121904296875001177790893554687500000001481581854847221611012619140625' Buffer Zone
 - Proposed 0.00017516230804060952148437500588895447777343750000000074079092742110555063098595703125' Buffer Zone
 - Proposed 0.008758115402030476072343750029444772388867187500000000370395463710555063098595703125' Buffer Zone
 - Proposed 0.0043790577010152380361718750014722386194443750000000185197731852775315479886953125' Buffer Zone
 - Proposed 0.0021895288505076190180859375000736119307222343750000000092598865926387657739434765625' Buffer Zone
 - Proposed 0.0010947644252538095090429687500036805965361171875000000004629943296387657739434765625' Buffer Zone
 - Proposed 0.000547382212626904754521484375000184029826808593750000000231497164819387657739434765625' Buffer Zone
 - Proposed 0.000273691106313345377260723437500092014913404296875000000011574858240969387657739434765625' Buffer Zone
 - Proposed 0.000136845553156672688630361718750004600745670214843750000000

LENAWEE COUNTY HEALTH DEPARTMENT

1040 SOUTH WINTER STREET, SUITE 2328, ADRIAN, MICHIGAN 49221-3871

JAMES VAN DOREN, Chairman
Board of Commissioners

HOWARD PENNINGTON, D.V.M.
Chairman, Board of Health

JOHN FRYE, Vice Chairman
Board of Health

MICHAEL KIGHT, R.S., M.S.
Health Officer

DENNIS K. CHERNIN, M.D., M.P.H.
Medical Director

MARY KILGORE VALLAD, M.S., R.N.
Director of Nursing

MARTHA E. HALL, REHS/RS, MPH
Environmental Health Director

MICHAEL ERNST, B.B.A.
Business Office Coordinator

December 15, 2009

Mr. Kevin Welch
309 E. Chicago Blvd.
Tecumseh, Mi 49286

Dear Mr. Welch,

Thank you for your recent communication regarding your concerns associated with drilling of wells in an area of known contamination within the City of Tecumseh.

As indicated during a recent phone conversation, the owner of the property of concern has yet to make application to construct a well. In the event that an application is received, the property owner will be required to provide information to the Lenawee County Health Department to demonstrate that construction of a well will not negatively impact groundwater. Additionally, the Lenawee County Health Department will work closely with our consultants at the Michigan Department of Environmental Quality to determine if construction of a well in this area might negatively impact wells that serve the City of Tecumseh water supply, or the surrounding area.

I have instructed my staff that well permits are not to be issued within the City of Tecumseh unless I have personally reviewed the file. It is my intention to work closely with the City of Tecumseh in resolving any issues regarding the issuance of well permits within the City of Tecumseh. I do however agree with state and federal officials who have suggested that implementation of government controls by the City of Tecumseh to limit the ability to drill wells within the City of Tecumseh would be the most effective means of control.

If you have any further questions regarding this matter, please feel free to contact me at (517) 264-5222.

Sincerely,



Martha Hall
Director of Environmental Health
Lenawee County Health Department

Technical Memorandum

To: Kevin Welch, City of Tecumseh

From: Stacy Metz and Graham Crockford

Subject: Completion of Well Decommissioning Activities

Date: September 12, 2012

Project: 004309.0001.0000

cc: Jason Smith, Tecumseh Products Company
Randy Kopke, Tecumseh Products Company
Douglas McClure, Conlin, McKenney and Philbrick, PC
Michelle Mullin, USEPA
Joseph Kelly, USEPA
Susan Pederma, USEPA

Introduction and Background

In 2010 and 2011, the City of Tecumseh worked with the Michigan Department of Environmental Quality (MDEQ) and Tecumseh Products Company (TPC) to prepare a Groundwater Use Ordinance. The City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former TPC manufacturing site. Specifically, the restricted area includes the area of affected groundwater, as well as an approximately one block buffer zone around the area of affected groundwater (Figure 1). A total of 272 parcels are included in the restricted zone. Groundwater use is restricted as follows:

- The installation, development, maintenance and use of private water wells is prohibited;
- Connection to the municipal water supply is required; and
- Existing private water wells must be abandoned.

In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone. The results of efforts undertaken to identify all private wells within the restricted zone are documented in the September 28, 2011, Technical Memorandum titled "Summary of 2011 Private Well Survey Results" and the February 3, 2012 Technical Memorandum titled "Status of Well Decommissioning Activities." The 2011 Private Well Survey identified a total of 24 possible private wells within the restricted area (272 parcels), including 17 possible wells which were not in use; 3 wells potentially used as a secondary, outdoor water supply, and 4 wells used as a primary drinking water source. The status of well survey and

decommissioning activities as of March 2012 for the 24 parcels identified during the 2011 Private Well Survey is summarized below:

- Facilitated by TPC, 4 wells had been decommissioned on December 16, 2011;
- The presence of wells was confirmed at 6 parcels;
- Potential evidence of the historical presence of wells was found at 7 parcels; and
- No well or evidence of a well was present at remaining 7 parcels.

June Well Decommissioning Activities

As of March 2, 2012, 13 parcels remained requiring or potentially requiring well decommissioning in order to comply with the City of Tecumseh's Groundwater Use Ordinance. TPC facilitated the remaining well decommissioning activities in June 2012. Wells were decommissioned by Alcock Drilling of Britton, Michigan under the oversight of TPC between June 4 and June 7, 2012. A brief letter report was provided to each homeowner documenting efforts to locate possible private wells and well decommissioning activities. Copies of those letters are included in Attachment 1. Well decommissioning activities are summarized below and in Table 1.

- Parcel 000-0421-00: Private well previously used as a primary water supply. Property connected to municipal water supply on January 24, 2012. Well decommissioned on June 7, 2012.
- Parcel 325-0312-00: Private well previously used as a secondary water supply. Second water meter installed for irrigation supply on January 24, 2012. Well decommissioned on June 5, 2012.
- Parcel 000-0272-00: Private well which had not been in use was verified and decommissioned on June 4, 2012.
- Parcel 000-0481-00: Potential well was actually an old septic tank. No well decommissioning required.
- Parcel 305-1021-00: Concrete pad, which owner identified as the possible location of a historic well, as well as approximately 2-feet of soil, were removed. No well found. Well decommissioning not required.
- Parcel 325-0301-00: Cross ties, which owner identified as the possible location of a historic well, as well as approximately 2-feet of soil, were removed. No well found. Well decommissioning not required.
- Parcel 325-0313-00: Private well which had not been in use was verified and decommissioned on June 4, 2012.
- Parcel 325-0321-00: Private well which had not been in use was verified and decommissioned on June 7, 2012.

Memorandum

Page 3 of 3

- Parcel 325-0370-00: Private well which had not been in use was verified and decommissioned on June 7, 2012.
- Parcel 325-0401-00: Private well which had not been in use was verified and decommissioned on June 7, 2012.
- Parcel 780-0330-00: Private well which had not been in use was verified and decommissioned on June 6, 2012.
- Parcel 780-0550-00: Concrete pad, which owner identified as the possible location of a historic well, as well as approximately 2-feet of soil, were removed. No well found. Well decommissioning not required.
- Parcel 810-0100-00: Concrete pad, which owner identified as the possible location of a historic well, as well as approximately 2-feet of soil, were removed. No well found. Well decommissioning not required.

Summary

In 2010 and 2011, the City of Tecumseh worked with the MDEQ and TPC to prepare a Groundwater Use Ordinance. The City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. A total of 272 parcels are included in the restricted zone. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

TPC conducted extensive well survey activities to identify all private wells within the restricted zone. A total of 12 private wells were identified. Well decommissioning activities were facilitated by TPC. As of June 7, 2012 all private wells within the restricted zone, including those which were not in use, had been decommissioned in compliance with the City of Tecumseh's Groundwater Use Ordinance.

Table

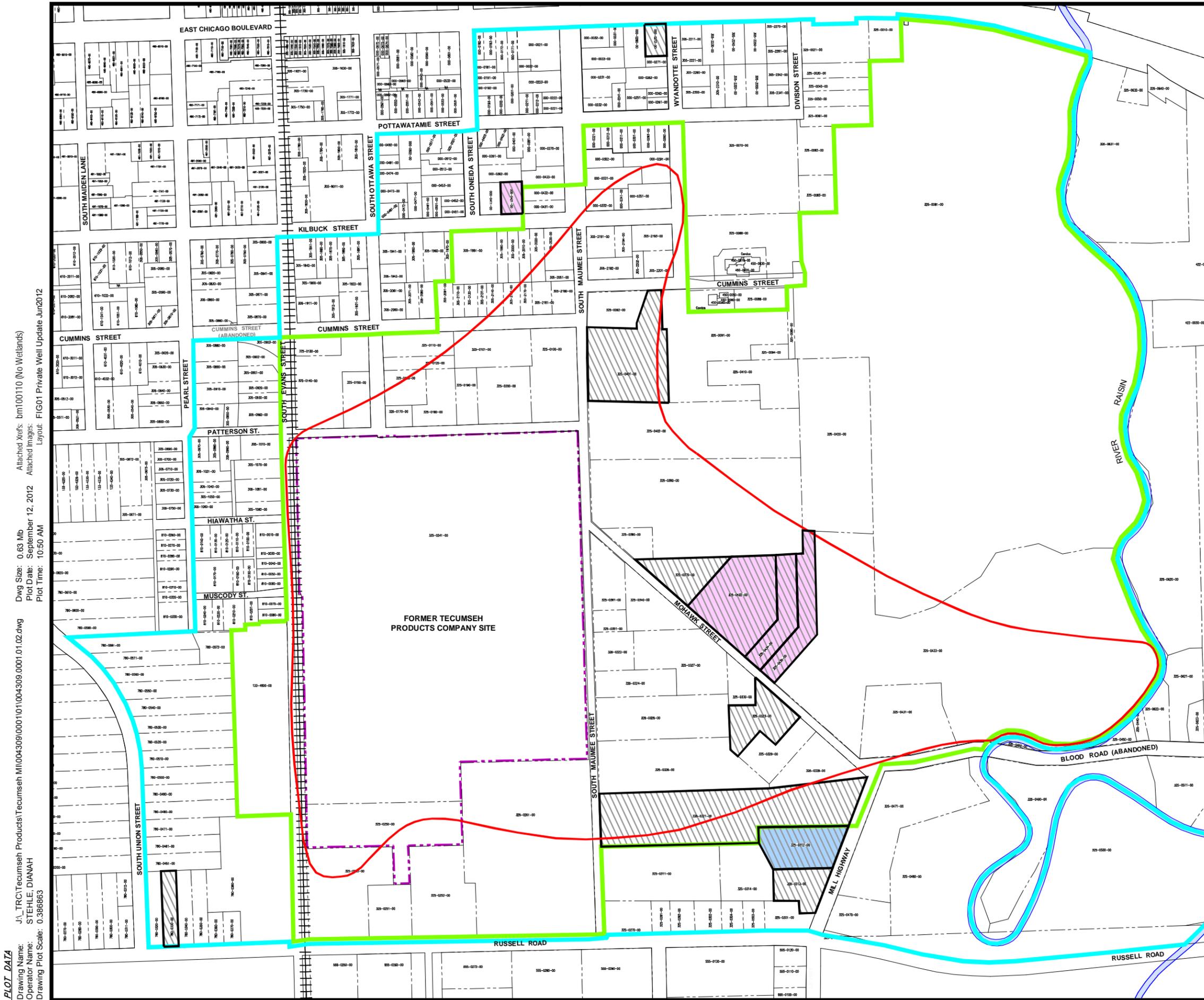
Table 1
 Parcels with Private Wells Within Groundwater Use Ordinance Area
 Well Status and Decommissioning Record
 Tecumseh, Michigan
 September 2012

Parcel #	Property Address	Owner Name	Owner Address	Owner City	ST	Zip Code	Private Supply Well Uses ⁽¹⁾	Well Status
Parcels with wells used as a primary, drinking water source and no connection to the municipal water supply								
000-0421-00	307 E KILBUCK ST	HEISLER, SHARON	307 E KILBUCK ST	TECUMSEH	MI	49286	Primary	Decomissioned 6/7/2012
325-0432-00	607 MOHAWK ST	LOGAN, ROBERT W	1207 MURRAY DR	TECUMSEH	MI	49286	Primary	Decomissioned 12/16/2011
325-0434-00	611 MOHAWK ST	BIRCHFIELD, RONALD A & SHERRIE L	615 MOHAWK ST	TECUMSEH	MI	49286	Primary	Decomissioned 12/16/2011
325-0435-00	615 MOHAWK ST	BIRCHFIELD, RONALD A & SHERRIE L	615 MOHAWK ST	TECUMSEH	MI	49286	Primary	Decomissioned 12/16/2011
Parcels with municipal water as the primary water source and a well that is used as a secondary, non-drinking water source								
325-0312-00	701 MILL HWY	MAYNARD MINI SERVICES, INC	101 CARRIAGE DR	TECUMSEH	MI	49286	Outdoor	Decomissioned 6/5/2012
Parcels with municipal water as the primary water source and a well that is not in use								
000-0272-00	416 E CHICAGO BLVD	KNISELY, CARLOS & BARBARA	6375 BILLMYER HWY	TECUMSEH	MI	49286	None	Decomissioned 6/4/2012
325-0313-00	803 MILL HWY	HURLEY, MATTHEW	803 MILL HWY	TECUMSEH	MI	49286	None	Decomissioned 6/4/2012
325-0321-00	800 S MAUMEE ST	ROBERTS INVESTMENT COMPANY LLC	P.O. BOX 400	TECUMSEH	MI	49286	None	Decomissioned 6/7/2012
325-0323-00	704 MOHAWK ST	BIRCHFIELD, TAYLOR & RONALD	704 MOHAWK ST	TECUMSEH	MI	49286	None	Decomissioned 12/16/2011
325-0370-00	509 MOHAWK ST	BATYIK, FRANK L	3614 NOLAND DR	TECUMSEH	MI	49286	None	Decomissioned 6/7/2012
325-0401-00	414 S MAUMEE ST	BOOT, MARTIN & CAROL	807 RED MILL DR	TECUMSEH	MI	49286	None	Decomissioned 6/7/2012
780-0330-00	205 W RUSSELL RD	WOTRING, LEONARD TRUST	205 W RUSSELL RD	TECUMSEH	MI	49286	None	Decomissioned 6/6/2012
Parcels with municipal water as the primary water source and no current well on the property								
000-0481-00	201 E KILBUCK ST	DAVIS, THOMAS B & SARAH L	409 E RUSSELL RD	TECUMSEH	MI	49286	None	No Well on Property
325-0301-00	515 E RUSSELL RD	HELMS TRUST, MICHAEL A & CAROL A	4324 BILLMEYER HWY	BRITTON	MI	49229	None	No Well on Property
305-1021-00	502 S PEARL ST	FROLICH, RICHARD J & CONSTANCE	502 S PEARL ST	TECUMSEH	MI	49286	None	No Well on Property
780-0550-00	738 S UNION ST	MATTHEWS, DEBRA K	738 S UNION ST	TECUMSEH	MI	49286	None	No Well on Property
810-0100-00	106 HIAWATHA ST	LEUTGEB, MARTIN A & MARSH, CHRISTINE	605 W POTTAWATAMIE	TECUMSEH	MI	49286	None	No Well on Property

Notes

1) Private supply well uses as of September 2011 are designated as follows: "None" - wells that are not in use, "Primary" - wells used as the primary water source from the parcel including drinking water, bathing, cleaning, and outdoor uses, and "Outdoor" - indicates wells used as a secondary water source for outdoor use only.

Figure



- ### LEGEND
- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
 - PARCEL BOUNDARY
 - PARCEL ID NUMBER
 - RAILROAD TRACKS (APPROXIMATE LOCATION)
 - BOUNDARY OF AREA THAT RECEIVED NOTICES OF OFF-SITE MIGRATION
 - BOUNDARY OF AREA AFFECTED BY GROUNDWATER USE ORDINANCE
 - EXTENT OF VOCs ABOVE MDEQ PART 201 DRINKING WATER CRITERIA

- ### WELL STATUS
- PROPERTIES WITH A PRIVATE WELL THAT WAS NOT IN USE (2011)
 - PROPERTIES WITH A PRIVATE WELL USED AS A PRIMARY WATER SUPPLY IN 2011
 - PROPERTIES WITH A PRIVATE WELL USED AS A SECONDARY WATER SUPPLY IN 2011
 - PRIVATE WELL HAS BEEN DECOMMISSIONED (2011/2012)

- ### NOTES
1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.

PLOT DATA
 Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004309\0001\01\004309.0001.01.02.dwg
 Operator Name: STEHLE, DIANAH
 Drawing Plot Scale: 0.386863
 Attached Xrefs: bml00110 (No Wetlands)
 Plot Date: September 12, 2012
 Plot Time: 10:50 AM
 Layout: FIG01 Private Well Update Jun2012

PROJECT:		FORMER TECUMSEH PRODUCTS SITE TECUMSEH, MICHIGAN	
TITLE:		PRIVATE WELL STATUS UPDATE JUNE 2012	
DRAWN BY:	SJL/DGS	SCALE:	AS INDICATED
CHECKED BY:	SEM	PROJ. NO.:	004309.0001.01
APPROVED BY:	GC	FILE NO.:	004309.0001.01.02.dwg
DATE:	SEPTEMBER 2012	DATE PRINTED:	
			FIGURE 1
		1540 Eisenhower Place Ann Arbor, MI 48108 Phone: 734.971.7080 Fax: 734.971.9022	

Attachment 1



September 7, 2012

Frank L. Batyik
3614 Noland Dr.
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 509 Mohawk St. (325-0370-00)

Dear Mr. Batyik:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 509 Mohawk St. on June 7, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



well pipe was located inside close to hot water tank





Pipe was filled with Benseal bentonite using a funnel.







MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
325-0370-00

1. LOCATION OF WELL
County Lenawee

Township Name Secaucus City

Fraction 1/4 1/4 1/4

Section No.

Town No. N/S

Range No. E/W

Distance and Direction from Road Intersection

Street Address & City of Well Location

12 OWNER OF WELL Frank Batyck
Address 509 Mohawk St
Secaucus, MI 49286
Address Same as Well Location Yes No

2. WELL DEPTH:
15 ft.

3. Date Plugging Completed
6/12/12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED
 Yes No (Explain in COMMENTS)

4. USE: Single Family Type I Public Heat Pump
 Irrigation Type II Public
 Test Well Type III Public

14. PLUGGING MATERIAL:
Bentonite Chips from 0 ft. to 15 ft. 15 50# bags
Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags
Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags
Neat Cement from _____ ft. to _____ ft. _____ 94# bags
Cement Grout from _____ ft. to _____ ft. _____ 94# bags
Other _____

5. REASON FOR ABANDONING WELL New Well Drilled
 Municipal Water Hookup Unrepairable
 Other _____

6. CASING:
1 1/4 in. dia. to 15 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL
 Steel Other _____
 Plastic

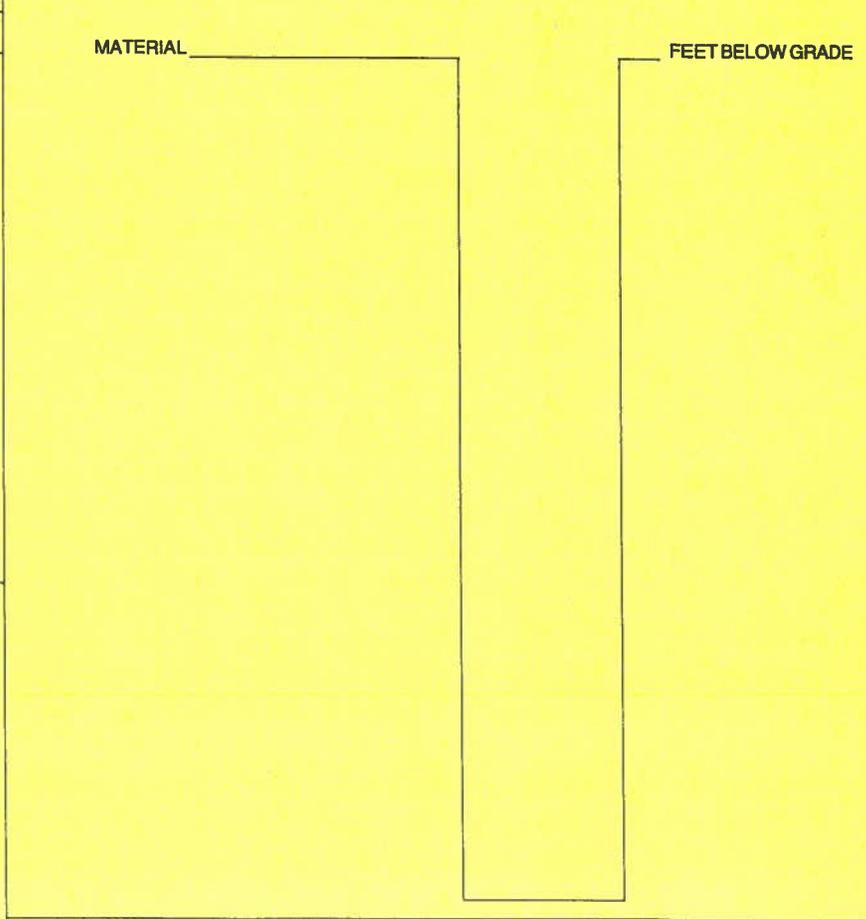
8. CASING STATUS AFTER PLUGGING
 Buried _____ ft. below grade Removed
 Above Grade _____ in.

15. LOST CIRCULATION ZONE MATERIALS USED Yes No
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

9. FLOWING WELL: Yes No

16. PLUGGING SKETCH (Complete if combination of materials was used.)
Show type of plugging materials and interval plugged.

10. SITE SKETCH:
Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.



11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.
Alcock Drilling, Inc 1272
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 6325 Sutton Rd Britton, ME 49229
Signed Jerry Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.



September 7, 2012

Martin and Carol Boot
807 Red Mill Dr.
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 414 S. Maumee St. (325-0401-00)

Dear Mr. and Mrs. Boot:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 414 S. Maumee St. on June 7, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



The well was not able to be pulled with tractor but was in a "locked condition". Both the well pipe and the casing was filled to overflowing with Benseal bentonite.



The entire well recessed area was then filled with Benseal bentonite and the grate was put back into place.





ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
325-0401-00

1. LOCATION OF WELL

County Lenawee Township Name Secaucus City Fraction 1/4 1/4 1/4 Section No. Town No. N/S Range No. E/W

Distance and Direction from Road Intersection

12 OWNER OF WELL Martin Bost
Address 414 S. Mawmaw St
Secaucus, MI 49286

Street Address & City of Well Location

Address Same as Well Location Yes No

2. WELL DEPTH:

50 ft.

3. Date Plugging Completed

6 17 12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED

Yes No (Explain in COMMENTS)

4. USE:

- Single Family Type I Public Heat Pump
- Irrigation Type II Public _____
- Test Well Type III Public

14. PLUGGING MATERIAL:

Bentonite Chips from 0 ft. to 50 ft. 4 50# bags

Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags

Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags

Neat Cement from _____ ft. to _____ ft. _____ 94# bags

Cement Grout from _____ ft. to _____ ft. _____ 94# bags

Other _____

5. REASON FOR ABANDONING WELL

- Municipal Water Hookup New Well Drilled
- Other _____ Unrepairable

6. CASING:

4 in. dia. to 50 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL

- Steel Other _____
- Plastic

8. CASING STATUS AFTER PLUGGING

- Buried 1 ft. below grade Removed
- Above Grade _____ in.

15. LOST CIRCULATION ZONE MATERIALS USED Yes No

Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

16. PLUGGING SKETCH (Complete if combination of materials was used.)

Show type of plugging materials and interval plugged.

MATERIAL _____ FEET BELOW GRADE

10. SITE SKETCH:

Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.

11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.

Alcock Drilling, Inc 1272
REGISTERED BUSINESS NAME REGISTRATION NO

Address 6325 Sutton Rd, Sutton, MI 49229

Signed Termy Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.



September 7, 2012

Thomas and Sarah Davis
409 E. Russell Road
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 201 E. Kilbuck St. (000-0481-00)

Dear Mr. and Mrs. Davis:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

Your property located at 201 E. Kilbuck St. was among those identified as potentially having a private well within the restricted zone. The purpose of this letter is to provide you with documentation of efforts made to confirm that a well is not present at that property and that no further well decommissioning activities are required. On April 12, 2012, Stacy Metz of TRC Environmental Corporation verified that the potential well was in fact an old septic tank. No well was found. A photographic log documenting efforts to locate a private well at 201 E. Kilbuck St. is included for your records (Attachment 1). A copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware that no private well is present and that the property located at 201 E. Kilbuck is compliant with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

A handwritten signature in black ink that reads "Jason Smith". The signature is written in a cursive style.

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA

Attachment #1



Stacy Metz of TRC verified that this is an old septic tank and is located approximately 10 feet above the water table (max tank depth of approx. 9 feet compared to a water table depth of approx. 20 feet below ground surface). This site does not fall under the decommissioning requirements of the City of Tecumseh groundwater use ordinance.



September 7, 2012

Richard and Constance Frolich
502 S. Pearl St.
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 502 S. Pearl St. (305-1021-00)

Dear Mr. and Mrs. Frolich:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

Your property located at 502 S. Pearl St. was among those identified as potentially having a private well within the restricted zone. The purpose of this letter is to provide you with documentation of efforts made to confirm that a well is not present at that property and that no further well decommissioning activities are required. On June 5, 2012, Alcock Drilling of Britton, Michigan removed the concrete pad which you identified as a possible location of a historic private well. Approximately two feet of soil below the pad was also removed. No well was found. A photographic log documenting efforts to locate a private well at 502 S. Pearl St. is included for your records (Attachment 1). A copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware that no private well is present and that the property located at 502 S. Pearl St. is compliant with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA

Attachment #1



Thick concrete pad removed with jack hammer.







We dug down about 2 feet to verify well existence. No well was found.





Dirt was put back into place / backfilled with sand / concrete was removed from site / top soil and hydroseeding was performed on June 8, 2012.







September 7, 2012

Sharon Heisler
307 E. Kilbuck Street
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 307 E. Kilbuck Street (000-0421-00)

Dear Ms. Heisler:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 307 E. Kilbuck Street on June 7, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

A handwritten signature in black ink that reads "Jason Smith". The signature is written in a cursive style.

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA





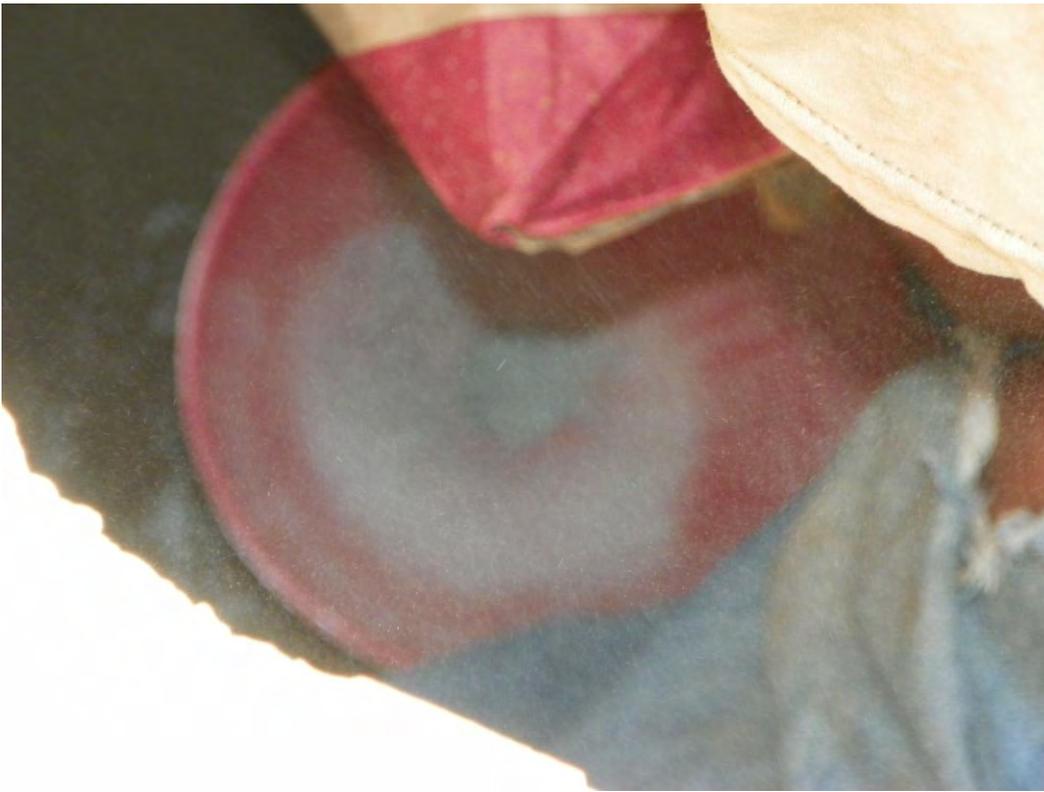
Removed concrete top with jack hammer





Tried to pull well but was not able / Cut off visible piping





After cutting off piping, the well pipe was slowly filled with Benseal bentonite.



Some concrete and 4-5 layers of brick were put down into the hole.



The hole was then backfilled with sand. The sand was covered with topsoil and hydro seeded on Friday, June 8, 2012



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
000042100

1. LOCATION OF WELL
County Lenawee

Township Name Securus City

Fraction 1/4 1/4 1/4

Section No.

Town No. N/S

Range No. E/W

Distance and Direction from Road Intersection

Street Address & City of Well Location

12 OWNER OF WELL Sharon Heisler
Address 307E Kilbuck St
Securus, MI 49286
Address Same as Well Location Yes No

2. WELL DEPTH:
26 ft.

3. Date Plugging Completed
6-17-12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED
 Yes No (Explain in COMMENTS)

4. USE: Single Family Type I Public Heat Pump
 Irrigation Type II Public
 Test Well Type III Public

14. PLUGGING MATERIAL:
Bentonite Chips from 0 ft. to 26 ft. 2 50# bags
Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags
Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags
Neat Cement from _____ ft. to _____ ft. _____ 94# bags
Cement Grout from _____ ft. to _____ ft. _____ 94# bags
Other _____

5. REASON FOR ABANDONING WELL New Well Drilled
 Municipal Water Hookup Unrepairable
 Other _____

6. CASING:
1 1/4 in. dia. to 26 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL
 Steel Other _____
 Plastic

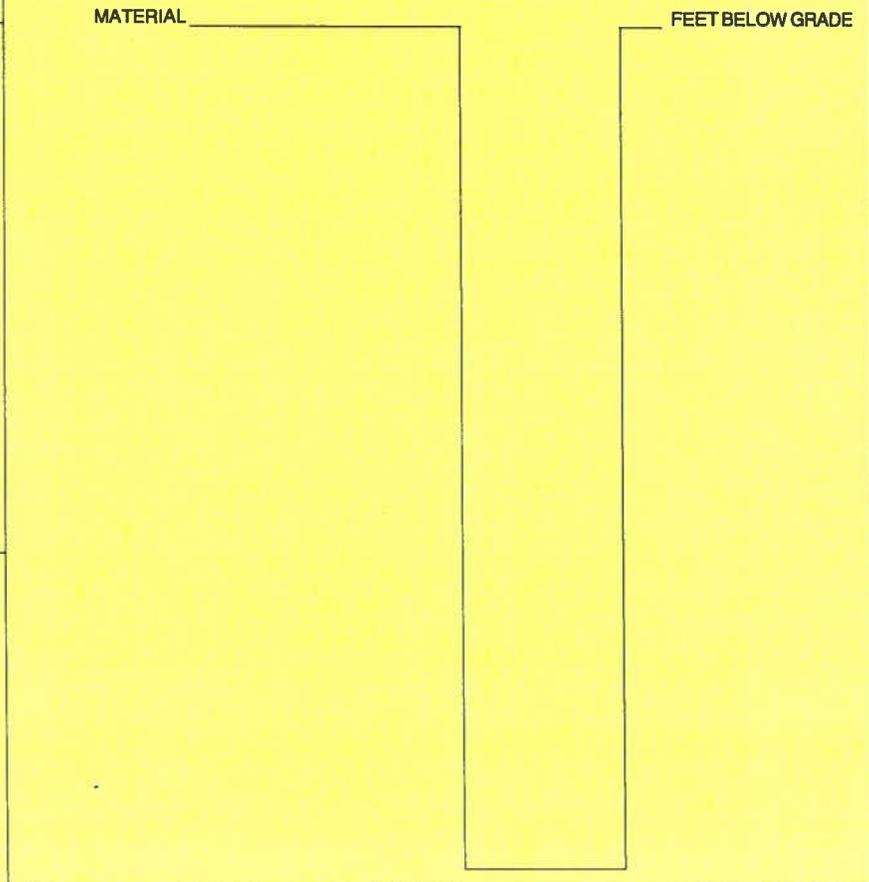
8. CASING STATUS AFTER PLUGGING
 Buried 3 ft. below grade Removed
 Above Grade _____ in.

15. LOST CIRCULATION ZONE MATERIALS USED Yes No
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

9. FLOWING WELL: Yes No

16. PLUGGING SKETCH (Complete if combination of materials was used.)
Show type of plugging materials and interval plugged.

10. SITE SKETCH:
Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.



11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.
Alcock Drilling, Inc 1272
REGISTERED BUSINESS NAME REGISTRATION NO
Address 6375 Sutton Rd. Britton, MI 49221
Signed Terry Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.



September 7, 2012

Helms Trust, Michael A and Carol A
4324 Billmeyer Hwy
Britton, MI 49229

RE: Well Decommissioning Activities at 515 E. Russell Road (325-0301-00)

Dear Mr. Eaton (Estate Caretaker):

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The property located at 515 E. Russell Road was among those identified as potentially having a private well within the restricted zone. The purpose of this letter is to provide you with documentation of efforts made to confirm that a well is not present at that property and that no further well decommissioning activities are required. On June 4, 2012, Alcock Drilling of Britton, Michigan removed the wooden logs which you identified as a possible location of a historic private well. Approximately two feet of soil below the soil surface was also removed. No well was found. A photographic log documenting efforts to locate a private well at 515 E. Russell Road is included for the property records (Attachment 1). A copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware that no private well is present and that the property located at 515 E. Russell Road is compliant with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



Removed old cross-ties from area and dug down 2 feet to search for piping.



No piping or even evidence of piping was found.









Area was refilled with dirt / compacted / backfilled with sand / covered with topsoil and hydroseeded on June 8, 2012.



Cross-ties were removed from site.



September 7, 2012

Matthew Hurley
803 Mill Highway
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 803 Mill Highway (325-0313-00)

Dear Mr. Hurley:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 803 Mill Highway on June 4, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition copy of this letter will be sent to the City of Tecumseh to ensure that City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA





Removing concrete cap with jack hammer





2 x 4 x 4-5 feet deep concrete block lined hole



Top fully removed



Hose and pump removed / casing was filled with 2 bags of Benseal bentonite.





Concrete cap residue was put back into hole / one layer of concrete block was also removed before back filling with sand.



The area was covered with topsoil and hydroseeded on June 8, 2012.



ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
325-6313-00

1. LOCATION OF WELL

County Lenawee Township Name Secaucus City Fraction 1/4 1/4 1/4 Section No. Town No. N/S Range No. E/W

Distance and Direction from Road Intersection

Street Address & City of Well Location

12 OWNER OF WELL Matthew Hurley
Address 803 Mill Hwy
Secaucus, MI 49286
Address Same as Well Location Yes No

2. WELL DEPTH:

18 ft.

3. Date Plugging Completed

6/14/12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED

Yes No (Explain in COMMENTS)

4. USE:

- Single Family Type I Public Heat Pump
- Irrigation Type II Public
- Test Well Type III Public

14. PLUGGING MATERIAL:

Bentonite Chips from 0 ft. to 18 ft. 2 50# bags

Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags

Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags

Neat Cement from _____ ft. to _____ ft. _____ 94# bags

Cement Grout from _____ ft. to _____ ft. _____ 94# bags

Other _____

5. REASON FOR ABANDONING WELL

- Municipal Water Hookup New Well Drilled
- Other _____ Unrepairable

6. CASING:

4 in. dia. to 18 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL

- Steel Other _____
- Plastic

15. LOST CIRCULATION ZONE MATERIALS USED Yes No

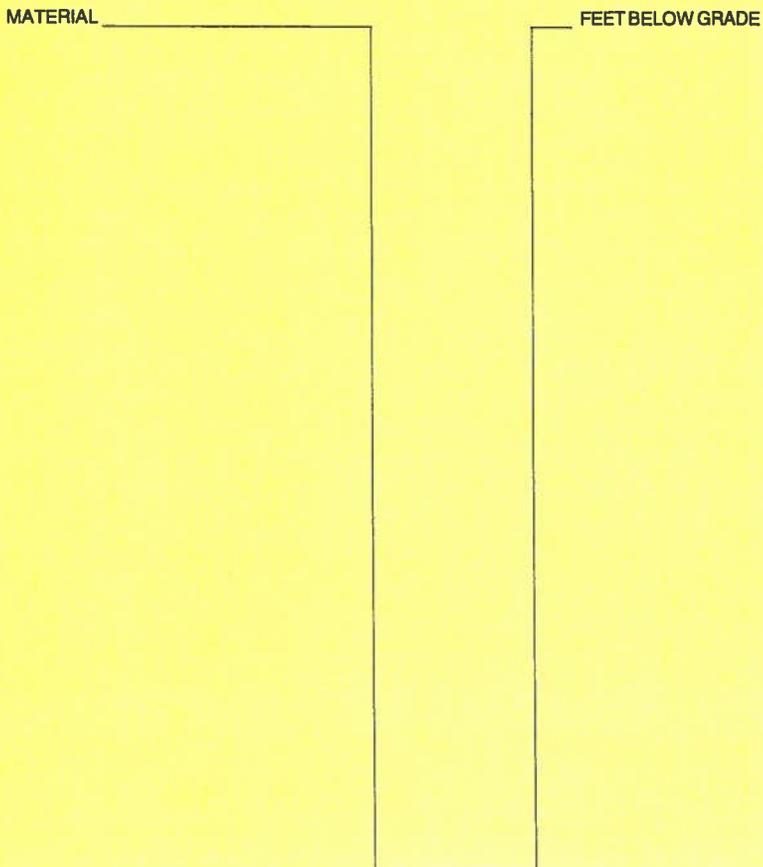
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

8. CASING STATUS AFTER PLUGGING

- Buried 5 ft. below grade Removed
- Above Grade _____ in.

16. PLUGGING SKETCH (Complete if combination of materials was used.)

Show type of plugging materials and interval plugged.



9. FLOWING WELL: Yes No

10. SITE SKETCH:

Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.

11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.

Alcock Drilling, Inc. 1272
REGISTERED BUSINESS NAME REGISTRATION NO

Address 6325 Sutton Rd. Britton, MI 49229

Signed Ferry Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.



September 7, 2012

Carlos and Barbara Knisely
6375 Billmyer Hwy
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 416 E. Chicago Blvd. (000-0272-00)

Dear Mr. and Mrs. Knisely:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 416 E. Chicago Blvd. on June 4, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



Concrete cap was removed / Old pump pipe was removed / 2-3 foot x 5 foot deep hole



Casing hole visible





Casing pipe was filled with 2 bags of Benseal until it overflowed.



4-5 outer layers of brick were removed from around the hole



The hole was then backfilled with sand / The area was covered with topsoil and hydro seeded on Friday, June 8, 2012.





MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

TAX NO:
000-0272-00

PERMIT NO:

1. LOCATION OF WELL		Township Name		Fraction		Section No.		Town No.		Range No.	
County <i>Lenawee</i>		<i>Secumash City</i>		1/4 1/4 1/4				N/S		E/W	

Distance and Direction from Road Intersection

Street Address & City of Well Location

12 OWNER OF WELL *Carlos Kriesely*
Address *416 E. Chicago Blvd.*
Secumash, MI 49286
Address Same as Well Location Yes No

2. WELL DEPTH: *26* ft.

3. Date Plugging Completed *6/14/12*

13. DROP PIPE/PUMPING EQUIPMENT REMOVED
 Yes No (Explain in COMMENTS)

4 USE: Single Family Type I Public Heat Pump
 Irrigation Type II Public
 Test Well Type III Public

14. PLUGGING MATERIAL:

Bentonite Chips	from <u>0</u> ft. to <u>26</u> ft.	<u>2</u> 50# bags
Bentonite Pellets	from _____ ft. to _____ ft.	_____ 50# bags
Bentonite Grout	from _____ ft. to _____ ft.	_____ 50# bags
Neat Cement	from _____ ft. to _____ ft.	_____ 94# bags
Cement Grout	from _____ ft. to _____ ft.	_____ 94# bags
Other	_____	

5. REASON FOR ABANDONING WELL New Well Drilled
 Municipal Water Hookup Unrepairable
 Other _____

6. CASING: 4 in. dia. to 26 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL
 Steel Other _____
 Plastic

8. CASING STATUS AFTER PLUGGING
 Buried 5 ft. below grade Removed
 Above Grade _____ in.

15. LOST CIRCULATION ZONE MATERIALS USED Yes No
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

9. FLOWING WELL: Yes No

16. PLUGGING SKETCH (Complete if combination of materials was used.)
Show type of plugging materials and interval plugged.

10. SITE SKETCH:
Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.

MATERIAL	FEET BELOW GRADE

11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.
Alcock Drilling, Inc. 1272
REGISTERED BUSINESS NAME REGISTRATION NO
Address *6375 Sutton Rd. Britton, MI 49229*
Signed *Terry Alcock* Date *6/10/12*
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.



September 7, 2012

Martin A. Leutgeb and Christine Marsh
605 W. Pottawatamie
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 106 Hiawatha St. (810-0100-00)

Dear Mr. Leutgeb and Ms. Marsh:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

Your property located at 106 Hiawatha St. was among those identified as potentially having a private well within the restricted zone. The purpose of this letter is to provide you with documentation of efforts made to confirm that a well is not present at that property and that no further well decommissioning activities are required. On June 6, 2012, Alcock Drilling of Britton, Michigan removed the concrete pad which you identified as a possible location of a historic private well. Approximately two feet of soil below the pad was also removed. No well was found. A photographic log documenting efforts to locate a private well at 106 Hiawatha St. is included for your records (Attachment 1). A copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware that no private well is present and that the property located at 106 Hiawatha St. is compliant with the Groundwater Use Ordinance.

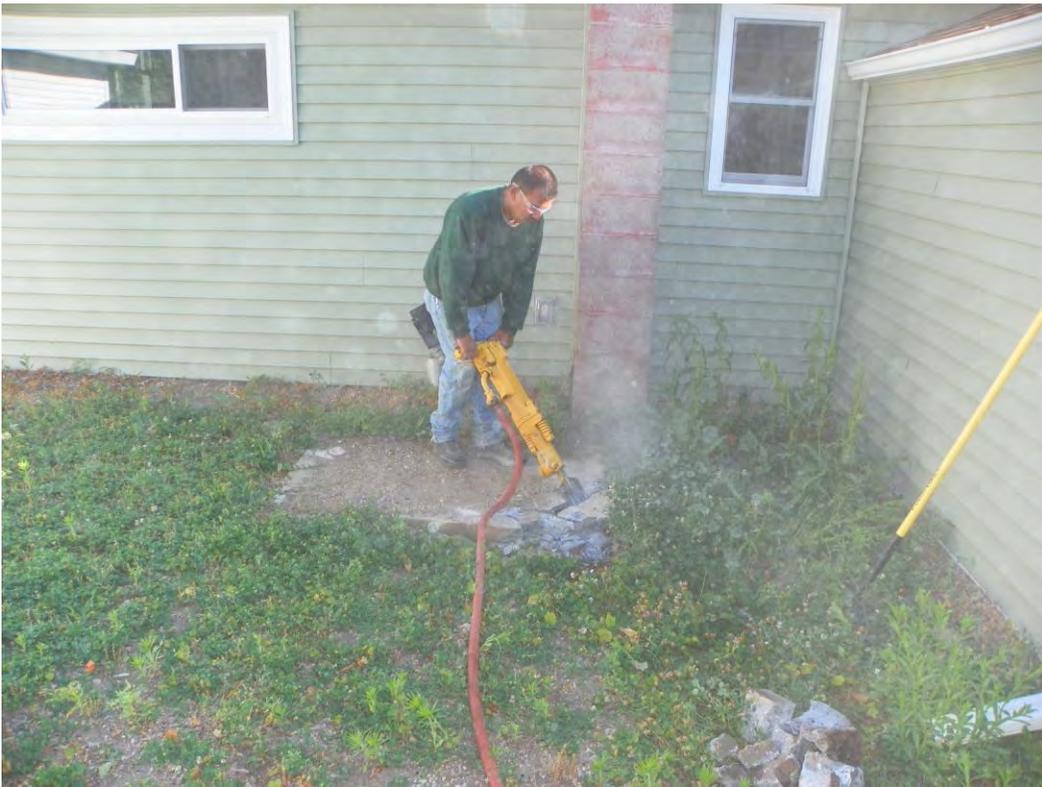
I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



Concrete cap being removed with jack hammer.





No hole underneath - We dug down about 2 feet to search for any piping





No piping was found. Hole was refilled with original dirt with sand on top.





Concrete was removed from site. Top soil and hydroseeding was performed on June 8, 2012.



September 7, 2012

Debra Matthews
738 S. Union St.
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 738 S. Union St. (780-0550-00)

Dear Ms. Matthews:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

Your property located at 738 S. Union St. was among those identified as potentially having a private well within the restricted zone. The purpose of this letter is to provide you with documentation of efforts made to confirm that a well is not present at that property and that no further well decommissioning activities are required. On June 4, 2012, Alcock Drilling of Britton, Michigan removed the concrete pad which you identified as a possible location of a historic private well. Approximately two feet of soil below the pad was also removed. No well was found. A photographic log documenting efforts to locate a private well at 738 S. Union St. is included for your records (Attachment 1). A copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware that no private well is present and that the property located at 738 S. Union St. is compliant with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

A handwritten signature in black ink that reads "Jason Smith". The signature is written in a cursive, flowing style.

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



Concrete pad being removed with jack hammer.





No evidence of a well or hole were found under the pad.





We dug down about two feet to search for any signs of piping. None were found.



The dirt was backfilled and then sand was added.



Concrete was removed from site and top soil and hydroseeding was performed at site on June 8, 2012.



September 7, 2012

Maynard Mini Services, Inc
701 Mill Highway
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 701 Mill Highway (325-0312-00)

Dear Mr. Maynard:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 701 Mill Highway on June 5, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



Well was pulled





Pipe was filled with Benseal.





PVC pipe was broken off about 1-2 feet below surface.





The hole was then backfilled with sand. No seeding was performed at this property at the request of the owner.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
325-0312-00

1. LOCATION OF WELL
County Lapeer

Township Name Securus City Fraction 1/4 1/4 1/4 Section No. Town No. N/S Range No. E/W

Distance and Direction from Road Intersection
Street Address & City of Well Location

12 OWNER OF WELL Maynard Mini Service
Address 701 Mill Hwy Securus, MI 49286
Address Same as Well Location Yes No

2. WELL DEPTH:
50 ft.

3. Date Plugging Completed
6/15/12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED
 Yes No (Explain in COMMENTS)

4. USE: Single Family Type I Public Heat Pump
 Irrigation Type II Public
 Test Well Type III Public

14. PLUGGING MATERIAL:
Bentonite Chips from 0 ft. to 50 ft. 5 50# bags
Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags
Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags
Neat Cement from _____ ft. to _____ ft. _____ 94# bags
Cement Grout from _____ ft. to _____ ft. _____ 94# bags
Other _____

5. REASON FOR ABANDONING WELL New Well Drilled
 Municipal Water Hookup Unrepairable
 Other _____

6. CASING:
5 in. dia. to 50 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL
 Steel Other _____
 Plastic

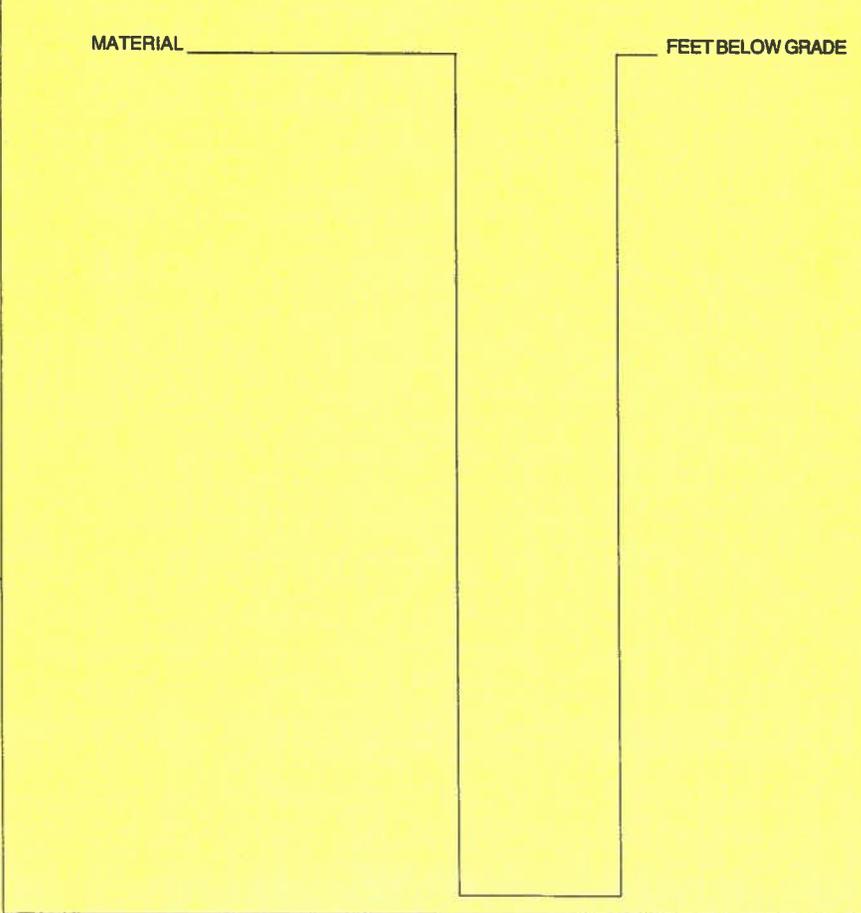
8. CASING STATUS AFTER PLUGGING
 Buried 1-2 ft. below grade Removed
 Above Grade _____ in.

15. LOST CIRCULATION ZONE MATERIALS USED Yes No
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

9. FLOWING WELL: Yes No

16. PLUGGING SKETCH (Complete if combination of materials was used.)
Show type of plugging materials and interval plugged.

10. SITE SKETCH:
Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.



11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.
Alcock Drilling Inc. 1272
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 6375 Sutton Rd. Sutton, MI 49229
Signed Terry Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.



September 7, 2012

Roberts Investment Company LLC
PO Box 400
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 800 S. Maumee St. (325-0321-00)

Dear Mr. Al Roberts:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 800 S. Maumee St. on June 7, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA

Attachment #1



Well pipe and casing were cut off about 1 foot below grade. All old electrical wiring was removed.



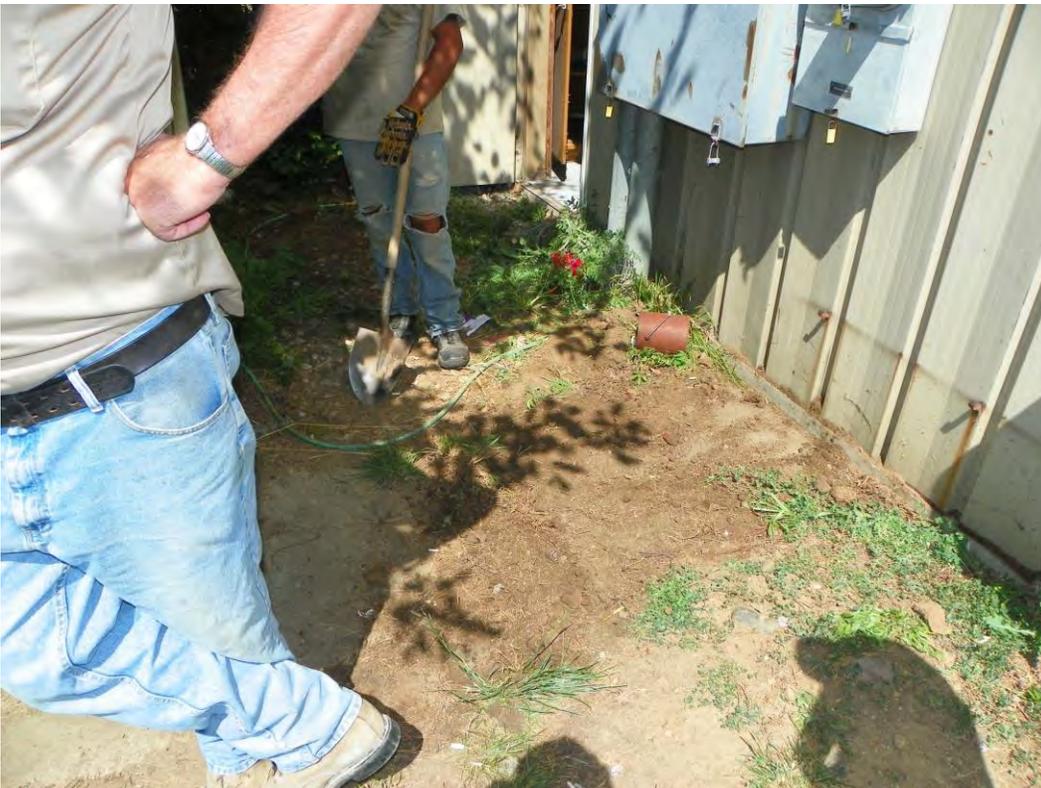


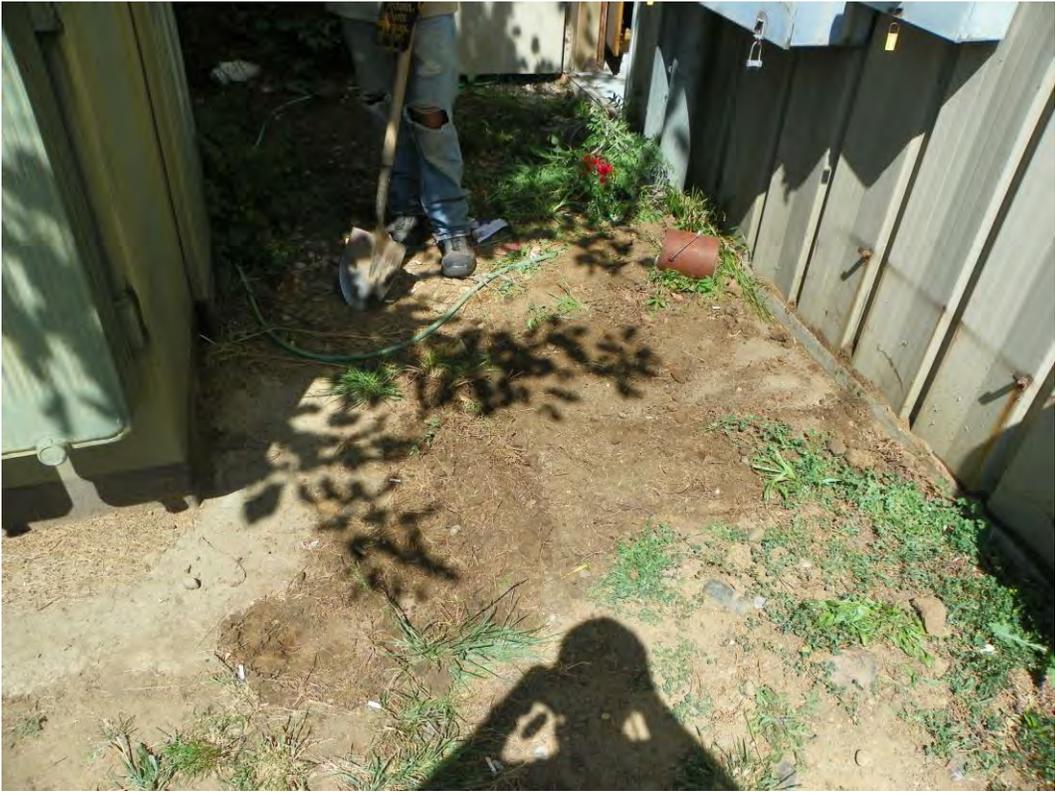
Well casing pipe and well pipe were filled with Benseal bentonite until overflowed.





Area was then backfilled with dirt and sand. No top soil or seeding were performed in this area since grass and weeds are kept to a minimum due to electrical panels/transformers in area.







MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
325-0321-00

1. LOCATION OF WELL
County Lenawee

Township Name Securus

Fraction 1/4 1/4 1/4

Section No.

Town No. N/S

Range No. E/W

Distance and Direction from Road Intersection

Street Address & City of Well Location

12. OWNER OF WELL Robert Investment Co.
Address 800 S Maumee St
Securus, MI 49286
Address Same as Well Location Yes No

2. WELL DEPTH:
50 ft.

3. Date Plugging Completed
6/17/12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED
 Yes No (Explain in COMMENTS)

4. USE: Single Family Type I Public Heat Pump
 Irrigation Type II Public
 Test Well Type III Public

14. PLUGGING MATERIAL:
Bentonite Chips from 0 ft. to 50 ft. 4 50# bags
Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags
Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags
Neat Cement from _____ ft. to _____ ft. _____ 94# bags
Cement Grout from _____ ft. to _____ ft. _____ 94# bags
Other _____

5. REASON FOR ABANDONING WELL New Well Drilled
 Municipal Water Hookup Unrepairable
 Other _____

6. CASING:
4 in. dia. to 50 ft. depth.
_____ in. dia. to _____ ft. depth

7. CASING MATERIAL
 Steel Other _____
 Plastic

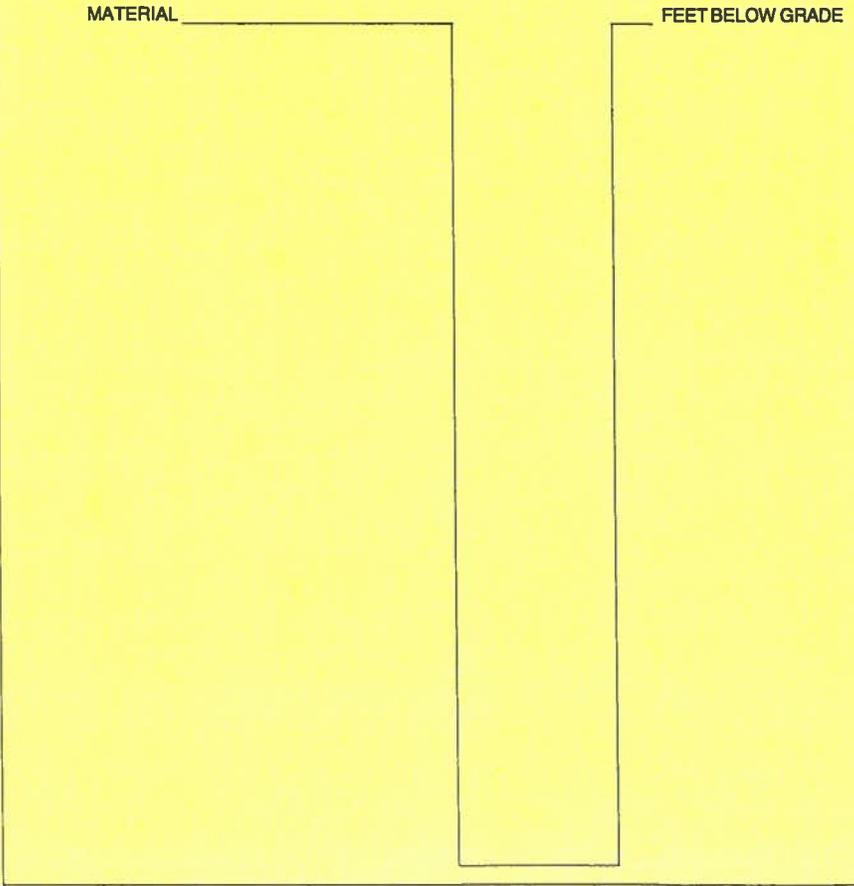
8. CASING STATUS AFTER PLUGGING
 Buried 1 ft. below grade Removed
 Above Grade _____ in.

15. LOST CIRCULATION ZONE MATERIALS USED Yes No
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

9. FLOWING WELL: Yes No

16. PLUGGING SKETCH (Complete if combination of materials was used.)
Show type of plugging materials and interval plugged.

10. SITE SKETCH:
Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.



11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.
Alcock Drilling, Inc. 1272
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 6375 Sutton Rd, Britton, MI 49227
Signed Jerry Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.

WELL OWNER COPY



September 7, 2012

Leonard Wotring Trust
205 W. Russell Road
Tecumseh, MI 49286

RE: Well Decommissioning Activities at 205 W. Russell Road (780-0330-00)

Dear Mr. Wotring:

As you are aware, the City of Tecumseh passed the Groundwater Use Ordinance on June 6, 2011. This ordinance restricts groundwater use in the area near the former Tecumseh Products Company (TPC) manufacturing site, and requires that existing private wells within the restricted zone be abandoned. In conjunction with preparation of the Groundwater Use Ordinance, TPC agreed to identify and abandon, with owner consent, private wells within the restricted zone.

The private well located on your property was among those identified within the restricted zone. The purpose of this letter is to provide you with documentation of well decommissioning activities conducted at 205 W. Russell Road on June 6, 2012. A photographic log documenting well decommissioning activities is included for your records (Attachment 1). I have also enclosed your original copy of the Michigan Department of Environmental Quality (MDEQ) Abandoned Well Plugging Record (Attachment 2). This form should be retained with your property files for future reference. Duplicate Well Plugging Records have been filed with the Lenawee County Health Department and the US Geological Survey, as required by the MDEQ. In addition, a copy of this letter will be sent to the City of Tecumseh to ensure that the City is aware of your compliance with the Groundwater Use Ordinance.

I would like to thank you again for your cooperation and assistance in TPC's efforts to ensure compliance with the groundwater use ordinance. If you have any remaining questions or concerns about the well decommissioning activities, please feel free to contact me at (731) 707-2889, or Randy Kopke, Tecumseh Products Company Facilities Manager, at (734) 585-9439.

Sincerely,
Tecumseh Products Company

Jason Smith
Corporate Environmental Director

Attachments: Attachment 1 – Well Decommissioning Photographic Log
Attachment 2 – Abandoned Well Plugging Record

cc: Randy Kopke, Facilities Manager, Tecumseh Products Company
Kevin Welch, Tecumseh City Manager
Steven Cunningham, MDEQ
Michelle Mullin, EPA



Not sure where the well was located. Spent a lot of time trying to find it.





Finally found the well about 5-6 feet down below grade.





Pulled well from casing





Filled casing with 2 1/2 bags of Benseal bentonite material





Backfilled area with original soils, sand added to top and then topsoil and hydroseeding were applied on June 8, 2012.





MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

ABANDONED WELL PLUGGING RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

PERMIT NO:

TAX NO:
780 0330 00

1. LOCATION OF WELL
County Lenawee

Township Name Secaucus City

Fraction 1/4 1/4 1/4

Section No.

Town No. N/S

Range No. E/W

Distance and Direction from Road Intersection

Street Address & City of Well Location

12 OWNER OF WELL Leonard Watling Trust
Address 205 W. Russell Rd. Secaucus, MI 49284
Address Same as Well Location Yes No

2. WELL DEPTH:
75 ft.

3. Date Plugging Completed
6/16/12

13. DROP PIPE/PUMPING EQUIPMENT REMOVED
 Yes No (Explain in COMMENTS)

4. USE: Single Family Type I Public Heat Pump
 Irrigation Type II Public
 Test Well Type III Public

14. PLUGGING MATERIAL:
Bentonite Chips from 0 ft. to 45 ft. 2 1/2 50# bags
Bentonite Pellets from _____ ft. to _____ ft. _____ 50# bags
Bentonite Grout from _____ ft. to _____ ft. _____ 50# bags
Neat Cement from _____ ft. to _____ ft. _____ 94# bags
Cement Grout from _____ ft. to _____ ft. _____ 94# bags
Other _____

5. REASON FOR ABANDONING WELL New Well Drilled
 Municipal Water Hookup Unrepairable
 Other _____

6. CASING:
4 in. dia. to 45 ft. depth.
_____ in. dia. to _____ ft. depth

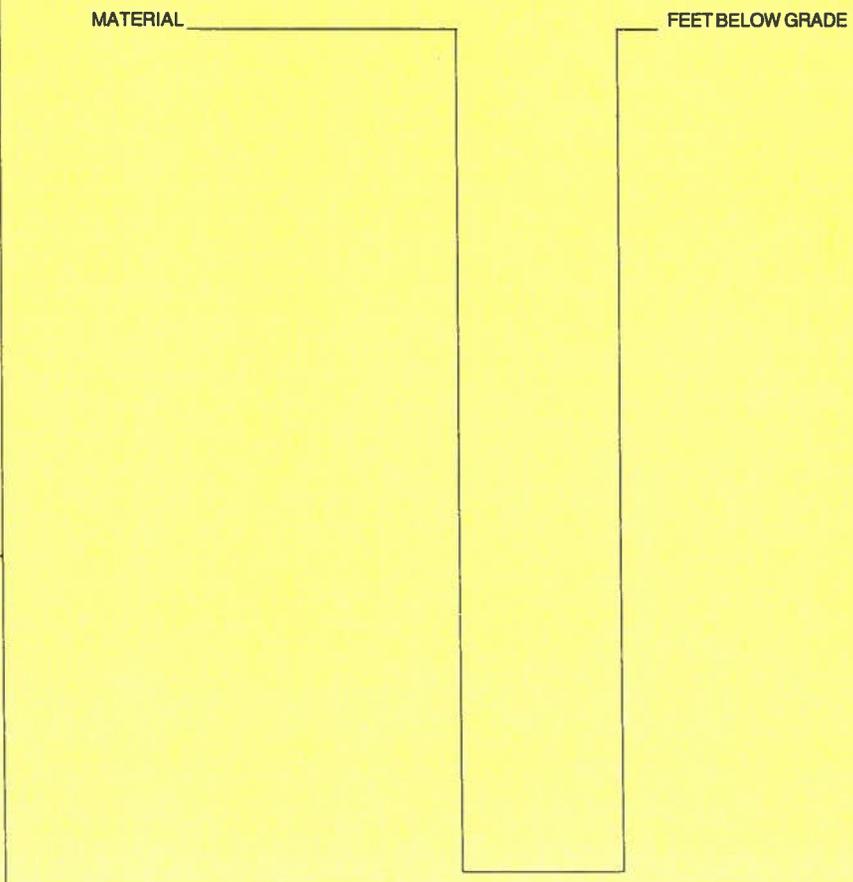
7. CASING MATERIAL
 Steel Other _____
 Plastic

15. LOST CIRCULATION ZONE MATERIALS USED Yes No
Type _____ Quantity _____ Placed from _____ ft. to _____ ft.

8. CASING STATUS AFTER PLUGGING
 Buried 4 ft. below grade Removed
 Above Grade _____ in.

16. PLUGGING SKETCH (Complete if combination of materials was used.)
Show type of plugging materials and interval plugged.

9. FLOWING WELL: Yes No



10. SITE SKETCH:
Show location of plugged well(s) relative to buildings, drives, roads, and other structures or landmarks on site. Include a North arrow.

11. COMMENTS

17. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was plugged under my jurisdiction and this report is true to the best of my knowledge and belief.
Alcock Drilling, Inc 1272
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 6375 Sutton Rd, Sutton, MI 49229
Signed Jerry Alcock Date 6/10/12
AUTHORIZED REPRESENTATIVE

NOTE: Plugging from well bottom up to ground surface is required.

IMPORTANT: File with deed.

Appendix E Residential Indoor Air and Crawl Space Sample Results

Table E1
Summary of Volatile Organic Compounds in Soil Gas at 704 Mohawk Street
Tecumseh Products Company
Tecumseh, Michigan

Analyte	Units	Residential SGSLs ⁽¹⁾	Sub-Slab Depressurization/Ventilation System Exhaust Sample			
			Oct 12, 2011	Nov 14, 2011	May 10, 2012	Nov. 8, 2012
Acetone	ppbv	82,000	8.7	<10	25	<10
Benzene	ppbv	32	0.07	<1.0	2.0	<1.0
Bromodichloromethane	ppbv	7.1	<0.10	<2.0	4.4	<2.0
Bromoform	ppbv	76	<0.10	<2.0	<0.50	<2.0
Bromomethane	ppbv	43	<0.10	<2.0	<0.50	<2.0
2-Butanone (MEK)	ppbv	56,000	0.83	<4.0	2.4	<4.0
Carbon disulfide	ppbv	7,400	<0.10	<2.0	0.80	<2.0
Carbon tetrachloride	ppbv	23	<0.05	<1.0	<0.50	<1.0
Chlorobenzene	ppbv	500	<0.10	<2.0	<0.25	<2.0
Chloroethane	ppbv	130,000	<0.10	<2.0	<0.50	<2.0
Chloroform	ppbv	73	0.23	<1.0	<0.25	<1.0
Chloromethane	ppbv	650	<0.10	<2.0	<0.50	<2.0
Dibromochloromethane	ppbv	4.1	<0.10	<2.0	<0.50	<2.0
1,2-Dibromoethane (EDB)	ppbv	0.19	<0.10	<2.0	<0.50	<2.0
1,2-Dichlorobenzene	ppbv	1,600	<0.10	<2.0	<0.50	<2.0
1,3-Dichlorobenzene	ppbv	16	<0.10	<2.0	<0.50	<2.0
1,4-Dichlorobenzene	ppbv	21	<0.10	<2.0	<0.50	<2.0
Dichlorodifluoromethane (F12)	ppbv	330,000	<0.20	<4.0	<1.0	<4.0
1,1-Dichloroethane	ppbv	4,100	8.0	11	8.1	15
1,2-Dichloroethane (EDC)	ppbv	8.2	<0.10	<2.0	<0.50	<2.0
1,1-Dichloroethene	ppbv	1,700	<0.10	<2.0	0.55	<2.0
cis-1,2-Dichloroethene	ppbv	58	8.1 ⁽²⁾	14	17	44
trans-1,2-Dichloroethene	ppbv	580	2.8	4.2	3.5	7.1
1,2-Dichloropropane	ppbv	29	<0.10	<2.0	<0.50	<2.0
cis-1,3-Dichloropropene	ppbv	47	<0.10	<2.0	<0.50	<2.0
trans-1,3-Dichloropropene	ppbv	47	<0.10	<2.0	<0.50	<2.0
Dichlorotetrafluoroethane (F114)	ppbv	NC	<0.10	<2.0	<0.50	<2.0
Ethylbenzene	ppbv	640	0.78	<2.0	6.9	<2.0
4-Ethyltoluene	ppbv	NC	<0.10	<2.0	<0.50	<2.0
Hexachlorobutadiene	ppbv	3.7	<0.20	<4.0	<1.0	<4.0
2-Hexanone (MBK)	ppbv	250	<0.20	<4.0	<1.0	<4.0
4-Methyl-2-pentanone (MIBK)	ppbv	24,000	<0.20	<4.0	<1.0	<4.0
Methylene chloride (Dichloromethane)	ppbv	880	<0.10	<2.0	1.0	<2.0
Styrene	ppbv	350	<0.10	<2.0	<0.50	<2.0
1,1,1,2-Tetrachloroethane	ppbv	17	<0.10	<2.0	<0.50	<2.0
1,1,2,2-Tetrachloroethane	ppbv	2.2	<0.10	<2.0	<0.50	<2.0
Tetrachloroethene	ppbv	170	<0.10	<2.0	<0.50	<2.0
Toluene	ppbv	44,000	<0.50	<10	15	<4.0
1,2,4-Trichlorobenzene	ppbv	18	<0.10	<2.0	<0.50	<2.0
1,1,1-Trichloroethane	ppbv	36,000	140	140	69	110
1,1,2-Trichloroethane	ppbv	9.8	<0.10	<2.0	<0.50	<2.0
Trichloroethene	ppbv	12	480	620	450	1,100
Trichlorofluoromethane (F11)	ppbv	330,000	1.9	<2.0	1.1	<2.0
1,1,2-Trichlorotrifluoroethane (F113)	ppbv	84,000	<0.50	<10	<1.0	<2.0
1,2,4-Trimethylbenzene	ppbv	1,500	0.11	<2.0	0.75	<2.0
1,3,5-Trimethylbenzene	ppbv	1,500	<0.10	<2.0	<0.50	<2.0
Vinyl chloride	ppbv	21	<0.05	<1.0 ⁽²⁾	<0.25	<1.0
m,p-Xylene	ppbv	760	0.81	<2.0	3.3	<2.0
o-Xylene	ppbv	760	0.34	<2.0	1.0	<2.0
1,1-Difluoroethane - TRACER	percent	1.0	<3.6 x 10 ⁻⁴	<3.6 x 10 ⁻⁴	<3.6 x 10 ⁻⁴	5.0 x 10⁻⁴

Notes:

- 1) Residential sub-slab soil gas screening levels (SGSLs) were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013
- 2) Quality control results for this datum are outside the established control limits. The result is approximate.

Bold font denotes concentrations detected above laboratory reporting limits.

Green background Denotes concentrations above the residential soil gas screening level.

ppbv = parts per billion by volume

NC = No Criterion

Table E2
Summary of Volatile Organic Compounds in Indoor Air at 704 Mohawk Street
Tecumseh Products Company
Tecumseh, Michigan

Analyte	Units	Residential Indoor Air Screening Levels ⁽¹⁾	Nov 14-15, 2011	May 10-11, 2012		Nov 8-9, 2012
			704 Mohawk Basement Sample	704 Mohawk Basement Sample	Duplicate - 704 Mohawk	704 Mohawk Basement Sample
Acetone	ppbv	2,500	9.3	4.0 ⁽²⁾	1.8 ⁽²⁾	3.4
Benzene	ppbv	0.97	0.19	0.13	0.13	0.42
Bromodichloromethane	ppbv	0.21	<0.20	<0.10	<0.10	<0.10
Bromoform	ppbv	2.3	<0.20	<0.10	<0.10	<0.10
Bromomethane	ppbv	1.3	<0.20	<0.10	<0.10	<0.10
2-Butanone (MEK)	ppbv	1,700	<0.40	0.29	0.20	0.31
Carbon disulfide	ppbv	220	<0.20	<0.10	<0.10	<0.10
Carbon tetrachloride	ppbv	0.68	<0.10	0.077	0.075	0.081
Chlorobenzene	ppbv	15	<0.20	<0.050	<0.050	<0.10
Chloroethane	ppbv	3,800	<0.20	<0.10	<0.10	<0.10
Chloroform	ppbv	2.2	<0.10	<0.050	<0.050	<0.050
Chloromethane	ppbv	20	<0.20	0.42	0.40	0.67
Dibromochloromethane	ppbv	0.12	<0.20	<0.10	<0.10	<0.10
1,2-Dibromoethane (EDB)	ppbv	0.0056	<0.20	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	ppbv	49	<0.20	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	ppbv	0.49	<0.20	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	ppbv	0.62	<0.20	<0.10	<0.10	<0.10
Dichlorodifluoromethane (F12)	ppbv	9,900	<0.40	<0.20	<0.20	0.29 ⁽³⁾
1,1-Dichloroethane	ppbv	120	<0.20	<0.10	<0.10	<0.10
1,2-Dichloroethane (EDC)	ppbv	0.24	<0.20	<0.10	<0.10	<0.10
1,1-Dichloroethene	ppbv	50	<0.20	<0.10	<0.10	<0.10
cis-1,2-Dichloroethene	ppbv	1.7	<0.20	<0.10	<0.10	<0.10
trans-1,2-Dichloroethene	ppbv	17	<0.20	<0.10	<0.10	<0.10
1,2-Dichloropropane	ppbv	0.86	<0.20	<0.10	<0.10	<0.10
cis-1,3-Dichloropropene	ppbv	1.4	<0.20	<0.10	<0.10	<0.10
trans-1,3-Dichloropropene	ppbv	1.4	<0.20	<0.10	<0.10	<0.10
Dichlorotetrafluoroethane (F114)	ppbv	NC	<0.20	<0.10	<0.10	<0.10
Ethylbenzene	ppbv	19	<0.20	<0.10	<0.10	<0.10
4-Ethyltoluene	ppbv	NC	<0.20	<0.10	<0.10	<0.10
Hexachlorobutadiene	ppbv	0.11	<0.40	<0.20	<0.20	<0.20
2-Hexanone (MBK)	ppbv	7.4	<0.40	<0.20	<0.20	<0.20
4-Methyl-2-pentanone (MIBK)	ppbv	730	<0.40	<0.20	<0.20	<0.20
Methylene chloride (Dichloromethane)	ppbv	27	<0.20	<0.10	<0.10	0.23
Styrene	ppbv	11	<0.20	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	ppbv	0.51	<0.20	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	ppbv	0.065	<0.20	<0.10	<0.10	<0.10
Tetrachloroethene	ppbv	5.0	<0.20	<0.10	<0.10	<0.10
Toluene	ppbv	1,300	1.9	0.55	0.47	0.86
1,2,4-Trichlorobenzene	ppbv	0.53	<0.20	<0.10	<0.10	<0.10
1,1,1-Trichloroethane	ppbv	1,100	<0.20	<0.10	<0.10	<0.10
1,1,2-Trichloroethane	ppbv	0.30	<0.20	<0.10	<0.10	<0.10
Trichloroethene	ppbv	0.37	<0.20	0.15	0.16	0.19
Trichlorofluoromethane (F11)	ppbv	9,900	0.21	0.26	0.25	0.26
1,1,2-Trichlorotrifluoroethane (F113)	ppbv	2,500	<1.0	<0.20	<0.20	<0.10
1,2,4-Trimethylbenzene	ppbv	44	<0.20	0.10	<0.10	<0.10
1,3,5-Trimethylbenzene	ppbv	44	<0.20	<0.10	<0.10	<0.10
Vinyl chloride	ppbv	0.62	<0.10 ⁽²⁾	<0.050	<0.050	<0.050
m,p-Xylene	ppbv	23	<0.20	0.20	0.15	0.24
o-Xylene	ppbv	23	<0.20	<0.10	<0.10	<0.10

Notes:

1) Residential Indoor Air Screening Levels were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013

2) Quality control results for this datum are outside the established control limits. The result is approximate.

3) Quality control results exceed quality control limits. Results are estimated and biased high.

ppbv = parts per billion by volume

NC = No criterion

Bold font denotes concentrations detected above laboratory reporting limits

Table E3
Summary of Volatile Organic Compounds in Crawl Space Samples at 610 Mohawk Street
Tecumseh Products Company
Tecumseh, Michigan

Analyte	Units	Residential Indoor Air Screening Levels ⁽¹⁾	October 11-12, 2011		May 10-11, 2012	November 8-9, 2012	
			610 Mohawk Crawlspace	Duplicate - 610 Mohawk	610 Mohawk Crawlspace	610 Mohawk Crawlspace	Duplicate - 610 Mohawk
Acetone	ppbv	2,500	1.9	2.2	2.7	5.7 ⁽²⁾	9.2 ⁽²⁾
Benzene	ppbv	0.97	0.20	0.21	0.23	1.4	1.4
Bromodichloromethane	ppbv	0.21	<0.10	<0.10	<0.10	<0.10	<0.10
Bromoform	ppbv	2.3	<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ppbv	1.3	<0.10	<0.10	<0.10	<0.10	<0.10
2-Butanone (MEK)	ppbv	1,700	<0.20	0.28	0.23	0.58	0.42
Carbon disulfide	ppbv	220	<0.10	<0.10	<0.10	<0.10	<0.10
Carbon tetrachloride	ppbv	0.68	0.080	0.070	0.077	0.079	0.077
Chlorobenzene	ppbv	15	<0.10	<0.10	<0.050	<0.10	<0.10
Chloroethane	ppbv	3,800	<0.10	<0.10	<0.10	<0.10	<0.10
Chloroform	ppbv	2.2	<0.050	<0.050	<0.050	<0.050	<0.050
Chloromethane	ppbv	20	<0.10	<0.10	0.21	0.59	0.60
Dibromochloromethane	ppbv	0.12	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	ppbv	49	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	ppbv	0.49	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	ppbv	0.62	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dibromoethane (EDB)	ppbv	0.0056	<0.10	<0.10	<0.10	<0.10	<0.10
Dichlorodifluoromethane (F12)	ppbv	9,900	<0.20	<0.20	<0.20	0.20 ⁽³⁾	0.21 ⁽³⁾
1,1-Dichloroethane	ppbv	120	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloroethane (EDC)	ppbv	0.24	<0.10	<0.10	<0.10	<0.10	<0.10
1,1-Dichloroethene	ppbv	50	<0.10	<0.10	<0.10	<0.10	<0.10
cis-1,2-Dichloroethene	ppbv	1.7	<0.10	<0.10	<0.10	<0.10	<0.10
trans-1,2-Dichloroethene	ppbv	17	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloropropane	ppbv	0.86	<0.10	<0.10	<0.10	<0.10	<0.10
cis-1,3-Dichloropropene	ppbv	1.4	<0.10	<0.10	<0.10	<0.10	<0.10
trans-1,3-Dichloropropene	ppbv	1.4	<0.10	<0.10	<0.10	<0.10	<0.10
Dichlorotetrafluoroethane (F114)	ppbv	NC	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	ppbv	19	<0.10	<0.10	<0.10	0.54	0.58
4-Ethyltoluene	ppbv	NC	<0.10	<0.10	<0.10	0.15	0.17
Hexachlorobutadiene	ppbv	0.11	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone (MBK)	ppbv	7.4	<0.20	<0.20	<0.20	<0.20	<0.20
4-Methyl-2-pentanone (MIBK)	ppbv	730	<0.20	<0.20	<0.20	<0.20	<0.20
Methylene chloride (Dichloromethane)	ppbv	27	<0.10	<0.10	<0.10	0.19	0.18
Styrene	ppbv	11	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	ppbv	0.51	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	ppbv	0.065	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethene	ppbv	5.0	0.11	<0.10	<0.10	0.10	0.10
Toluene	ppbv	1,300	0.74	0.65	0.63	3.6	3.7
1,2,4-Trichlorobenzene	ppbv	0.53	0.16	<0.10	<0.10	<0.10	<0.10
1,1,1-Trichloroethane	ppbv	1,100	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2-Trichloroethane	ppbv	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Trichloroethene	ppbv	0.37	<0.10	<0.10	<0.10	0.12	0.11
Trichlorofluoromethane (F11)	ppbv	9,900	0.24	0.22	0.23	0.29	0.29
1,1,2-Trichlorotrifluoroethane (F113)	ppbv	2,500	<0.50	<0.50	<0.20	0.10	0.15
1,2,4-Trimethylbenzene	ppbv	44	0.15	0.13	0.12	0.65	0.71
1,3,5-Trimethylbenzene	ppbv	44	<0.10	<0.10	<0.10	0.18	0.19
Vinyl chloride	ppbv	0.62	<0.050	<0.050	<0.050	<0.050	<0.050
m,p-Xylene	ppbv	23	0.35	0.34	0.24	1.9	2.0
o-Xylene	ppbv	23	0.14	0.13	<0.10	0.65	0.69

Notes:

1) Residential Indoor Air Screening Levels were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013

2) Duplicate result is outside quality control limits. Result is estimated.

3) Quality control results exceed quality control limits. Results are estimated and biased high.

ppbv = parts per billion by volume

NC = No criterion

Bold font denotes concentrations detected above laboratory reporting limits

Table E4
Summary of Volatile Organic Compounds in Speer/Klanke Crawl Space Samples
Tecumseh Products Company
Tecumseh, Michigan

Analyte	Units	Residential Indoor Air Screening Levels ⁽¹⁾	502 Mohawk Deep Crawlspace			502 Mohawk Bedroom Crawlspace			505 Maumee Crawlspace			507 Maumee Crawlspace		
			Oct. 11-12, 2011	May 10-11, 2012	Nov. 8-9, 2012	Oct. 11-12, 2011	May 10-11, 2012	Nov. 8-9, 2012	Oct. 11-12, 2011	May 10-11, 2012	Nov. 8-9, 2012	Oct. 11-12, 2011	May 10-11, 2012	Nov. 8-9, 2012
Acetone	ppbv	2,500	4.5	5.3	7.2	6.6	14	12	4.2	1.8	3.1	<0.50	4.2	1.6
Benzene	ppbv	0.97	0.97	0.40	0.73	0.68	0.40	0.64	<0.10	0.082	0.31	0.060	<0.050	0.13
Bromodichloromethane	ppbv	0.21	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Bromoform	ppbv	2.3	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ppbv	1.3	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
2-Butanone (MEK)	ppbv	1,700	0.55	0.43	0.45	0.74	1.2	1.0	<0.40	<0.20	<0.20	<0.20	0.51	<0.20
Carbon disulfide	ppbv	220	<0.20	<0.10	<0.10	<0.20	6.2	3.6	<0.20	<0.10	<0.10	0.17	<0.10	<0.10
Carbon tetrachloride	ppbv	0.68	<0.10	0.080	0.083	<0.10	0.078	0.083	<0.10	0.074	0.088	0.050	0.075	0.081
Chlorobenzene	ppbv	15	<0.20	<0.050	<0.10	<0.20	<0.050	<0.10	<0.20	<0.050	<0.10	<0.10	<0.050	<0.10
Chloroethane	ppbv	3,800	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Chloroform	ppbv	2.2	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050
Chloromethane	ppbv	20	<0.20	0.67	<0.10	<0.20	0.79	0.54	<0.20	0.19	0.34	0.10	0.11	0.13
Dibromochloromethane	ppbv	0.12	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	ppbv	49	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	ppbv	0.49	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	ppbv	0.62	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dibromoethane (EDB)	ppbv	0.0056	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Dichlorodifluoromethane (F12)	ppbv	9,900	<0.40	<0.20	0.30 ⁽²⁾	<0.40	<0.20	0.27 ⁽²⁾	<0.40	<0.20	0.38 ⁽²⁾	<0.20	0.25	0.31 ⁽²⁾
1,1-Dichloroethane	ppbv	120	<0.20	<0.10	<0.10	0.25	<0.10	0.12	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloroethane (EDC)	ppbv	0.24	0.23	0.12	0.11	<0.20	0.13	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,1-Dichloroethene	ppbv	50	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
cis-1,2-Dichloroethene	ppbv	1.7	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
trans-1,2-Dichloroethene	ppbv	17	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloropropane	ppbv	0.86	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
cis-1,3-Dichloropropene	ppbv	1.4	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
trans-1,3-Dichloropropene	ppbv	1.4	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Dichlorotetrafluoroethane (F114)	ppbv	NC	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	ppbv	19	<0.20	<0.10	0.13	1.1	0.15	0.19	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
4-Ethyltoluene	ppbv	NC	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Hexachlorobutadiene	ppbv	0.11	<0.40	<0.20	<0.20	<0.40	<0.20	<0.20	<0.40	<0.20	<0.20	<0.20	<0.20	<0.20
2-Hexanone (MBK)	ppbv	7.4	<0.40	<0.20	<0.20	<0.40	<0.20	<0.20	<0.40	<0.20	<0.20	<0.20	<0.20	<0.20
4-Methyl-2-pentanone (MIBK)	ppbv	730	<0.40	<0.20	<0.20	<0.40	<0.20	0.23	<0.40	<0.20	<0.20	<0.20	<0.20	<0.20
Methylene chloride (Dichloromethane)	ppbv	27	<0.20	0.15	3.3	<0.20	0.32	7.2	<0.20	<0.10	0.27	<0.10	<0.10	0.18
Styrene	ppbv	11	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1,2-Tetrachloroethane	ppbv	0.51	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	ppbv	0.065	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethene	ppbv	5.0	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	ppbv	1,300	2.2	0.68	1.6	1.7	1.2	2.1	<1.0	0.26	0.90	<0.50	0.26	0.35
1,2,4-Trichlorobenzene	ppbv	0.53	<0.20	<0.10	<0.10	<0.20	<1.0	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1-Trichloroethane	ppbv	1,100	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	0.28	<0.10
1,1,2-Trichloroethane	ppbv	0.30	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Trichloroethene	ppbv	0.37	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Trichlorofluoromethane (F11)	ppbv	9,900	0.23	0.23	0.29	0.24	0.36	0.33	0.23	0.24	0.34	<0.10	0.25	0.29
1,1,2-Trichlorotrifluoroethane (F113)	ppbv	2,500	<1.0	<0.20	<0.10	<1.0	<0.20	<0.10	<1.0	<0.20	0.12	<0.50	<0.20	<0.10
1,2,4-Trimethylbenzene	ppbv	44	<0.20	0.12	0.23	<0.20	0.12	0.20	<0.20	<0.10	0.15	<0.10	<0.10	<0.10
1,3,5-Trimethylbenzene	ppbv	44	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10
Vinyl chloride	ppbv	0.62	<0.10	<0.050	0.10	<0.10	<0.050	0.053	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050
m,p-Xylene	ppbv	23	0.50	0.25	0.49	0.78	0.43	0.61	<0.20	0.11	0.32	<0.10	0.11	0.12
o-Xylene	ppbv	23	<0.20	<0.10	0.16	0.33	0.13	0.23	<0.20	<0.10	0.12	<0.10	<0.10	<0.10

Notes:

1) Residential Indoor Air Screening Levels were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013

2) Quality control results exceed quality control limits. Results are estimated and biased high.

ppbv = parts per billion by volume

NC = No criterion

Bold font denotes concentrations detected above laboratory reporting limits

Appendix F

On-Site SSDV System and SVE System Performance Evaluation Results

Table F1
Summary of Volatile Organic Compounds in Indoor Air at S-Building
Tecumseh Products Company
Tecumseh, Michigan

Analyte	Units	Non-Residential Indoor Air Screening Levels ⁽¹⁾	Nov 14-15, 2011	Feb. 28-29, 2012
Acetone	ppbv	10,000	120	5.0
Benzene	ppbv	4.9	0.16	1.1
Bromodichloromethane	ppbv	1.1	<0.20	<0.10
Bromoform	ppbv	11	<0.20	<0.10
Bromomethane	ppbv	5.4	<0.20	<0.10
2-Butanone (MEK)	ppbv	1,700	0.57	0.30
Carbon disulfide	ppbv	940	<0.20	<0.10
Carbon tetrachloride	ppbv	3.4	<0.10	0.081
Chlorobenzene	ppbv	63	<0.20	<0.10
Chloroethane	ppbv	16,000	<0.20	<0.10
Chloroform	ppbv	11	<0.10	<0.050
Chloromethane	ppbv	98	0.45	0.44
Dibromochloromethane	ppbv	0.62	<0.20	<0.10
1,2-Dibromoethane (EDB)	ppbv	0.028	<0.20	<0.10
1,2-Dichlorobenzene	ppbv	210	<0.20	<0.10
1,3-Dichlorobenzene	ppbv	2.1	<0.20	<0.10
1,4-Dichlorobenzene	ppbv	3.1	<0.20	<0.10
Dichlorodifluoromethane (F12)	ppbv	42,000	<0.40	2.9
1,1-Dichloroethane	ppbv	510	<0.20	<0.10
1,2-Dichloroethane (EDC)	ppbv	1.2	<0.20	<0.10
1,1-Dichloroethene	ppbv	210	<0.20	<0.10
cis-1,2-Dichloroethene	ppbv	7.3	<0.20	<0.10
trans-1,2-Dichloroethene	ppbv	73	<0.20	<0.10
1,2-Dichloropropane	ppbv	3.6	<0.20	<0.10
cis-1,3-Dichloropropene	ppbv	7.2	<0.20	<0.10
trans-1,3-Dichloropropene	ppbv	7.2	<0.20	<0.10
Dichlorotetrafluoroethane (F114)	ppbv	NC	<0.20	<0.10
Ethylbenzene	ppbv	96	<0.20	0.30
4-Ethyltoluene	ppbv	NC	<0.20	<0.10
Hexachlorobutadiene	ppbv	0.55	<0.40	<0.20
2-Hexanone (MBK)	ppbv	31	<0.40	<0.20
4-Methyl-2-pentanone (MIBK)	ppbv	3,000	<0.40	<0.20
Methylene chloride (Dichloromethane)	ppbv	130	<0.20	<0.10
Styrene	ppbv	53	<0.20	<0.10
1,1,1,2-Tetrachloroethane	ppbv	2.6	<0.20	<0.10
1,1,1,2,2-Tetrachloroethane	ppbv	0.33	<0.20	<0.10
Tetrachloroethene	ppbv	25	<0.20	0.17
Toluene	ppbv	5,500	<1.0	3.6
1,2,4-Trichlorobenzene	ppbv	2.2	<0.20	<0.10
1,1,1-Trichloroethane	ppbv	4,600	<0.20	<0.10
1,1,2-Trichloroethane	ppbv	1.5	<0.20	<0.10
Trichloroethene	ppbv	1.5	0.57	0.82
Trichlorofluoromethane (F11)	ppbv	42,000	0.26	0.32
1,1,2-Trichlorotrifluoroethane (F113)	ppbv	11,000	<1.0	<0.20
1,2,4-Trimethylbenzene	ppbv	190	<0.20	0.27
1,3,5-Trimethylbenzene	ppbv	190	<0.20	<0.10
Vinyl chloride	ppbv	12	<0.10	<0.050
m,p-Xylene	ppbv	96	<0.20	1.2
o-Xylene	ppbv	96	<0.20	0.34

Notes:

1) Non-Residential Indoor Air Criteria were taken from the MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2013.

2) One criterion listed for all Xylenes

ppbv = parts per billion by volume

NC = No criterion

Bold font denotes concentrations detected above laboratory reporting limits

Table F2
Summary of Constituents of Concern in On-Site Mitigation System Exhaust Samples and Calculated Emission Rate
Former Tecumseh Products Site
Tecumseh, Michigan

Analyte		Approximate Flow Rate	1,1-Dichloroethane*	1,2-Dichloroethane*	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetra-chloroethene*	1,1,1-Trichloroethane	Tri-chloroethene*	Vinyl Chloride*	Carcinogenic VOC Flow Rate ⁽¹⁾
Units		ACFM	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	lb/mo
Other On-Site Emission Sources												
S-Building SSDV System Exhaust	4/25/2012	43	3.2	<0.40	<0.40	16	1.4	2.7	18	350	<0.40	0.22
Methane Ventilation System Exhaust	4/25/2012	8	15	<0.40	0.64	100	2.3	<0.40	<0.40	6.4	2.4	0.002
Pilot SVE System												
Pilot SVE System Exhaust (Line 1) (48% Make-Up Air) ⁽²⁾	4/25/2012	460	0.95	<0.40	<0.40	9.7	1.1	3.2	6.9	160	<0.40	1.1
	5/2/2012	444	2.5	<0.40	<0.40	9.5	0.97	3.2	7.3	290	<0.40	1.9
Calculated Pilot SVE System Exhaust (Line 1) (No Make-Up Air) ⁽²⁾	4/25/2012	460	1.8	<0.77	<0.77	19	2.1	6.2	13	310	<0.77	2.1
	5/2/2012	444	4.8	<0.77	<0.77	18	1.9	6.2	14	560	<0.77	3.6
Full-Scale SVE System												
Line 1 - SVE System Influent	8/23/2012	401	<1.0	2.3	<1.0	<1.0	<2.0	<1.0	<1.0	13	<1.0	0.08
	11/3/2012	404	<240	<49	<250	<250	<250	43	<180	3,900	<39	23
	11/8/2012	361	<120	<24	<120	<120	<120	17	<91	2,000	<19	10
Line 2 - SVE System Influent	8/23/2012	0	26	<10	<10	2,400	74	85	44	7,200	14	--
	11/3/2012	415	<270	<54	<270	5,400	270	190	<200	18,000	150	108
	11/8/2012	384	130	<24	<120	6,300	340	120	140	15,000	110	83
SVE System Exhaust (No Treatment)	7/26/2012	422	19	5.2	<4.0	1,600	48	84	35	7,900	20	48
	8/8/2012	422	48	<2.4	2.8	2,700	150	140	93	10,000	41	61
Lead Carbon Vessel Influent	12/3/2012	730	<120	<24	<120	3,700	<120	140	<91	12,000	26	126
	1/3/2012	738	<120	<24	<120	2,300	<120	85	<91	5,900	<19	63
	5/23/2013	725	<120	<24	<120	520	<120	33	<91	2,400	<19	25
Between Carbon Vessels (Lead Vessel Effluent / Lag Vessel Influent)	11/8/2012	745	210	<24	<120	6,600	<120	<15	160	2,300	57	26
	12/3/2012	730	<120	<24	<120	3,700	140	<15	<91	12,000	28	124
	1/3/2012	738	<120	<24	<120	3,500	<120	24	<91	2,600	<19	28
	5/23/2013	725	<120	<24	<120	730	<120	<15	<91	<18	<19	0.0
SVE System Exhaust (Post Treatment)	11/3/2012	819	<2.0	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	30	29	0.51
	11/8/2012	749	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	55	0.28
	1/3/2012	738	33	<1.0	16.0	880	24	<1.0	<1.0	4.1	9.4	0.35
	5/23/2013	725	<120	<24	<120	<120	<120	<15	<91	<18	<19	0.0

Notes:

ACFM - actual cubic feet per minute

ppbv - parts per billion by volume

lb/mo - pounds per month

Asterisk * indicates compound is carcinogenic.

1) MDEQ Permit to Install exemption requirements include total hazardous air pollutants, total air contaminants and total carcinogenic volatile organic compounds (VOCs). For the SVE system the total carcinogenic VOC emissions are the limiting requirement.

The limits for total carcinogenic VOC emissions are 20 lb/mo for uncontrolled emissions and 10 lb/mo for controlled emissions.

2) Pilot study exhaust samples collected on April 25, 2012 and May 2, 2012 were collected when system exhaust included approximately 48-percent make-up air. Sample results were used to calculate the exhaust concentration if the system was operated without make-up air.