August 1, 2018

Mr. Stanley Radon, CPG
New York State Dept. of Environmental Conservation
Division of Solid and Hazardous Materials, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

Re: *Year 13 – Annual ICM Operation and Performance Summary Report*
Tecumseh Redevelopment Inc. – Lackawanna, New York Site
Former Benzol Plant Tank Storage Area (SWMU P-11) Interim Corrective Measure (ICM)

Dear Mr. Radon:

On behalf of Tecumseh Redevelopment Inc., TurnKey Environmental Restoration, LLC is herein providing the annual (Year 13) summary of the Benzol Plant Interim Corrective Measure (ICM) operation performance monitoring, as required in Section 4.4 of the ICM Work Plan, and groundwater monitoring performed in accordance with the Groundwater Monitoring Plan. The groundwater sampling and treatment system performance monitoring event was performed in December 2017 and April 2018.

PAST/CURRENT MONITORING SCHEDULE

This monitoring event signifies the completion of thirteen continuous years of ICM operation since the April 2005 start-up. This annual report includes a running tabular and/or graphical assessment and a more detailed discussion of groundwater quality trends, collection and treatment volumes, treated effluent quality, and groundwater capture/flow patterns. A schedule summarizing past monitoring events and future planned monitoring events is presented in Table 1. Future semi-annual sampling events are typically scheduled in October and April of each monitoring year. Within this report, the current monitoring event refers to the second semi-annual event of Year 13 and the current monitoring period refers to both semi-annual monitoring events conducted in Year 13 (e.g., December 2017 and April 2018).

GROUNDWATER TREATMENT SYSTEM OPERATION

The groundwater treatment system was operated within design parameters during the current monitoring period except for routine short-duration shutdowns related to: cleaning of the air stripper; power outages, repairs; and maintenance. All performance monitoring samples (influent, effluent, and downgradient groundwater) for the second semi-annual event were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) per USEPA Method 8260B.

- *GROUNDWATER CAPTURE*
  Static groundwater level measurements obtained on December 2017 are summarized in Table 2. The groundwater elevations presented in this table were used to create an isopotential map

presented as Figure 1. Due to the cycling operation of each recovery well, the pump off elevation was used to prepare the isopotential map. Static groundwater level measurements obtained on May 2018 are summarized in Table 3. The groundwater elevations presented in this table were used to create an isopotential map presented as Figure 2. Due to the cycling operation of each recovery well, the pump off elevation was used to prepare the isopotential map. Consistent with previous results, the capture zone extends laterally north to south approximately 430 feet and east to west approximately 160 feet (see Figure 2), which indicates that the collection system is effectively maintaining groundwater capture.

– *FLOW MEASUREMENTS*
Flow measurements for the collection system from start-up through April 26, 2018 have been recorded with the current monitoring period measurements included in Attachment 1. In general, the volume of groundwater collected and treated during the current monitoring period (approximately 2,069,497 gallons) was within the mid-range of historical quantities over the same time span (i.e., annual); of which approximately 98.2% was discharged to the North Infiltration Gallery (NIG) and approximately 1.8% to the South Infiltration Gallery (SIG).

– *PRODUCT RECOVERY*
Since July 2009, ten recovery wells (RW-1, 2, 3, B, C, D, F, G, H, and I), one monitoring well (MWN-31A), and 8 piezometers (BPP-05, 06, 08, 13, 17, 19, 23, and 24) that have historically contained measureable product. Since start-up these locations have been monitored monthly for product accumulation as part of routine O&M. Any well/piezometer exhibiting product thickness measurements greater than 0.3 feet are manually purged of accumulated product utilizing a portable skimmer pump, bailer, or an absorbent sock. Recovered product was quantified, reported in Attachment 1, and contained on-site in 55-gallon drums with secondary containment. During the current monitoring period approximately 28.25 gallons (or 207.26 pounds) of product was removed which represents approximately 2.1% of the total approximately 1,360 gallons (or 9,780 pounds) since the April 2005 start-up. Based on the product thickness levels and recovered quantities since start-up, it appears that the rate of light non-aqueous phase liquid (LNAPL) being removed at the Site has significantly slowed, which we expect to continue.

Product thickness measurements from the current monitoring period were performed concurrent with groundwater level measurements on December 8, 2017 and May 11, 2018 at on-site piezometers, monitoring wells, and recovery wells with the results presented in Table 2 and Table 3. The product recovery log sheet for the current monitoring period is included in Attachment 1.

– *TREATMENT SYSTEM REMOVAL*
Table 4 summarizes the treatment system performance for the current monitoring period. Effluent analytical results indicate greater than 99.8% reduction in VOC concentration for the current monitoring period. Table 5 summarizes the mass (i.e. 1,788 pounds) of aqueous-phase liquid (APL) removed.

YEAR 13 GROUNDWATER MONITORING SUMMARY

Field activities for the current monitoring period were performed in accordance with the Groundwater Monitoring Plan (dated November 24, 2004) without deviation. Table 6 summarizes the Year 13 field parameters and analytical results. Field data forms are provided in Attachment 2.

Compounds detected above method detection limits are shown on Table 6 with their associated concentration and NYSDEC Groundwater Quality Standard (NYSDEC TOGS 1.1.1, Ambient Water Quality Standards and Guidance Values, June 1998) for comparison. Guidance Values are presented where Standards have not been established for a specific compound. Concentrations exceeding NYSDEC Groundwater Quality Standards/Guidance Values (GWQS/GV) are shaded. In general, total VOC analytical results for the current monitoring event appear similar in comparison to historical concentrations for wells MWN-53A and MWN-54A. A pronounced decline in total VOC concentration continues for well MWN-55AR.

On December 5, 2017, the NYSDEC issued a request for Turnkey to sample additional parameters as part of the routine groundwater monitoring. This request included analysis of 1,4-Dioxane and 21 perfluorinated chemicals (PFCs) listed by NYSDEC, as a part of a state-wide initiative for emerging contaminants. One monitoring location was selected form the former benzol tank area (MWN-55AR) to be sampled for these emerging contaminants.

Emergent contaminant analysis for 1,4-dioxane (via EPA Method 8270D Selective Ion Monitoring (SIM)) and several of the 21 PFCs requested (via Method EPA 537) were detected above laboratory method detection limits at the location sampled. However, no groundwater quality standards are available for these parameters currently. The analytical results are summarized on Table 6. Low concentrations of several PFCs were reported above laboratory detection limits in the Field Blank.

ANNUAL ASSESSMENT OF DATA TRENDS

The following observations and assessments are based upon comparison of Year 13 data to data collected during previous years of operation.

- **Downgradient Groundwater Quality Trends**: Historical downgradient groundwater monitoring time versus concentration plots are presented in Attachment 3. Examination of the historical groundwater data indicates, in general, BTEX compounds are the primary compounds detected in downgradient groundwater. As indicated in the plots, and consistent with previous results, groundwater quality continues to show improvement from pre-ICM conditions for all three monitoring locations.

- **ICM Operation & Performance:** The groundwater collection and treatment system has been operated nearly continuous within design parameters each year with the exception of shutdowns for routine cleaning and repairs. In general, the total concentration of influent sample VOCs has been declining since 2005 from a high of 161.9 mg/L to the most recent concentration of 14.01 mg/L (see Attachment 4).

- **Hydraulic Capture:** The second semi-annual shallow groundwater isopotential map for Year 13 is presented as Figure 2. Based upon examination of the isopotential map prepared from May 2018 (second semi-annual event), a significant zone of hydraulic capture continues to exist. Although groundwater elevations fluctuate monitoring events, the overall shape and size of the capture zone changes very little year over year indicating that the ICM collection system consistently continues to maintain effective groundwater capture at the Site.

- **Flow Measurements:** The total volume of groundwater collected and treated since the April 2005 start-up is approximately 30,994,000 gallons; approximately 27,646,000 gallons (89%) of treated groundwater was discharged to the NIG and approximately 3,348,000 gallons (11%) was discharged to the SIG. During the current monitoring year, almost all treated groundwater was discharged to the NIG. A minor quantity of treated groundwater (approximately 37,156 gallons) was temporarily discharged to the SIG from January 3, to January 15, 2018 while the discharge line to the NIG was frozen.

- **Total VOC Mass Removed:** From the April 2005 start-up through the current monitoring period, product thickness versus time plots indicate a significant decrease in product thickness in all monitoring points historically containing measurable product, including recovery well RW-2, and at some monitoring locations, no measurable product continues to be observed. Since start-up, approximately 30,994,000 gallons of groundwater has been collected and treated and nearly 26,206 pounds of APL mass and approximately 9,979 pounds of LNAPL removed (see Table 5). The total mass of aqueous- and non-aqueous-phase VOC contamination removed from the groundwater since start-up and recycled is approximately 36,186 pounds (or 18.09 tons). As indicated in the bar chart and evidenced by the removal of nearly 18.1 tons of contaminant mass, significant progress has been and continues to be made with operation of this ICM.

- **Treatment System Influent/Effluent Quality:** All performance monitoring (i.e., influent and effluent) VOCs reported above laboratory detection limits as well as time versus concentration plots since start-up are summarized in Attachment 4. The constituents of primary concern (COPCs) presented in Attachment 4 include total VOCs and BTEX compounds. Secondary constituent VOCs detected infrequently or frequently reported at trace concentrations include acetone, 2-butanone, carbon disulfide, chlorobenzene, cyclohexane, 1,2-dichlorbenzene, isopropylbenzene, methylcyclohexane, methylene chloride, 1,2,4-Trimethlybenzene and 1,3,5-Trimethlybenezene. Initially, from May 2005 through August 2005, the COPCs detected in the monitored influent samples increased (see plots in Attachment 4). However, concentrations from September 2005 through to the present, have generally been decreasing (with concentrations likely varying with infiltration events). Stabilizing influent VOC concentrations may be indicative of substantially reduced presence of LNAPL as previously discussed. Now that hydraulic capture has been established, the source plume substantially contained, and recoverable free-phase LNAPL has greatly declined along with a decreasing influent concentration trend, influent analysis will continue to be a leading indicator of system recovery performance going forward.

NYSDEC EQuIS Deliverables

On January 4, and June 6, 2018, TurnKey submitted the analytical data in Electronic Data Deliverable (EDD) format for the current monitoring event to the NYSDEC on behalf of Tecumseh to satisfy the NYSDEC EQuIS submittal requirement. TurnKey received confirmation on January 19 and June 19, 2018 that the submittals were successfully uploaded, and the data is available for use within the NYSDEC system.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Brock Greene
Project Environmental Scientist

ec: S. Radon, (NYSDEC – Region 9)
A. Zwack, (NYSDEC – Region 9)
M. Brady, (NYSDEC – Region 9)
K. Nagel, (Tecumseh)
P. Werthman, (TurnKey)

File: 0071-017-910

TABLES

TABLE 1

ICM MONITORING SCHEDULE
YEAR 13 MONITORING PERIOD

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Event No. [1]	Monitoring Event	Event Frequency	Water Level / LNAPL Monitoring Date	Performance Monitoring Date	Groundwater Monitoring Date
--	March-05	pre-start-up	03/16/05	--	03/18/05
0	April-05 (04/26/05)	start-up	--	05/04/05	--
1	May-05	monthly	05/23/05	05/31/05	--
2	June-05	monthly/quarterly	06/30/05	06/30/05	06/30/05
3	July-05	monthly	07/29/05	08/04/05	--
4	August-05	monthly	08/26/05	08/29/05	--
5	September-05	monthly/quarterly	09/22/05	09/23/05	09/23/05
6	October-05	monthly	10/24/05	10/31/05	--
Y1Q3	December-05	quarterly	12/20/05	12/05/05	12/05/05
Y1Q4	April-06	quarterly	04/10/06	04/14/06	04/14/06
Y2Q1	July-06	quarterly	07/10/06	07/10/06	07/10/06
Y2Q2	October-06	quarterly	10/30/06	10/30/06	10/20/06
Y2Q3	January-07	quarterly	01/18/07	01/18/07	01/18/07
Y2Q4	April-07	quarterly	04/23/07	04/16/07	04/16/07
Y3SA1	October-07	semi-annual	10/18/07	10/19/07	10/19/07
Y3SA2	April-08	semi-annual	04/10/08	04/10/08	04/10/08
Y4SA1	November-08	semi-annual	11/17/08	11/17/08	11/17/08
Y4SA2	April-09	semi-annual	04/08/09	04/08/09	04/08/09
Y5SA1	November-09	semi-annual	11/13/09	11/13/09	11/13/09
Y5SA2	April-10	semi-annual	04/29/10	04/29/10	04/29/10
Y6SA1	October-10	semi-annual	10/22/10	10/22/10	10/22/10
Y6SA2	April-11	semi-annual	04/26/11	04/26/11	04/26/11
Y7SA1	October-10	semi-annual	10/28/11	10/28/11	10/28/11
Y7SA2	April-11	semi-annual	05/01/12	05/01/12	05/01/12
Y8SA1	October-12	semi-annual	10/03/12	10/03/12	10/03/12
Y8SA2	April-13	semi-annual	04/04/13	04/04/13	04/04/13
Y9SA1	October-13	semi-annual	10/29/13	10/29/13	10/29/13
Y9SA2	April-14	semi-annual	04/21/14	04/21/14	04/21/14
Y10SA1	October-14	semi-annual	10/21/14	10/21/14	10/21/14
Y10SA2	April-15	semi-annual	05/01/15	04/30/15	05/01/15
Y11SA1	October-15	semi-annual	No Sampling Event		
Y11SA2	April-16	semi-annual	04/06/16	04/06/16	04/06/16
Y12	October-16	semi-annual	10/24/16	10/26/16	10/21/16
	April-16	semi-annual	04/05/16	04/05/16	04/05/16
Y13	December-17	semi-annual	12/08/17	12/20/17	12/20/17
	April-18	semi-annual	05/11/18	04/19/18	04/18/18
Y14	October-18	semi-annual	TBC	TBC	TBC
	April-19	semi-annual	TBC	TBC	TBC

Notes:

1. Event number includes the first six monthly performance monitoring events (i.e., 1 through 6) followed by quarterly events (i.e., Q3, Q4 and so on),
2. Q = quarter
3. SA = semi-annual
4. TBC = to be completed
5. Y = years following start-up; year 1, year 2, year 3, etc.

Start-up Date: **04/26/05**
Final Day of Current Event: **04/26/18**
No. of Days Since Startup: **4748**

Annual Breakdown:

Semi-Annual	*Month*	
SA1	*May*	
	June	
	July	
	August	
	September	
	OCTOBER	monitoring event
SA2	*November*	
	December	
	January	
	February	
	March	
	APRIL	monitoring event

TABLE 2

SUMMARY OF GROUNDWATER ELEVATIONS
December 8, 2017 (Y13SA1)

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)	"Pump Off" Probe Elevation (fmsl)	Corrected Groundwater Elevation [3] (fmsl)
RECOVERY WELLS (12)							
RW-1	583.03	NP	6.50	NP	576.53	573.00	576.53
RW-2	582.97	NP	5.99	NP	576.98	573.00	576.98
RW-3	582.61	NP	6.16	NP	576.45	na	576.45
RW-A	583.26	NP	6.40	NP	576.86	573.00	576.86
RW-B	584.06	NP	7.49	NP	576.57	573.00	576.57
RW-C	583.88	10.51	10.52	0.01	573.36	573.00	573.37
RW-D	583.76	NP	5.44	NP	578.32	573.00	578.32
RW-E	583.71	NP	7.54	NP	576.17	573.00	576.17
RW-F	583.68	5.51	5.68	0.17	578.00	573.00	578.14
RW-G	583.38	7.11	7.18	0.07	576.20	573.00	576.26
RW-H	583.11	NP	7.11	NP	576.00	573.00	576.00
RW-I	582.89	11.41	11.43	0.02	571.46	573.00	571.48
PIEZOMETERS (14)							
BPP-03	585.18	NP	7.64	NP	577.54	na	577.54
BPP-04	*~ D E S T R O Y E D ~*						
BPP-05	*~ D E S T R O Y E D ~*						
BPP-05R	585.18	NP	7.16	NP	578.02	na	578.02
BPP-06	583.42	7.70	7.71	0.01	575.71	na	575.72
BPP-07	*~ D E S T R O Y E D ~*						
BPP-08	*~ D E S T R O Y E D ~*						
BPP-09	*~ D E S T R O Y E D ~*						
BPP-13	584.69	7.70	7.71	0.01	576.98	na	576.99
BPP-17	584.73	NP	7.98	NP	576.75	na	576.75
BPP-18	585.38	NP	7.73	NP	577.65	na	577.65
BPP-19	585.67	NP	9.58	NP	576.09	na	576.09
BPP-20	585.73	NP	8.90	NP	576.83	na	576.83
BPP-21	586.33	NP	8.65	NP	577.68	na	577.68
BPP-22	585.57	NP	7.70	NP	577.87	na	577.87
BPP-23	586.19	NP	6.29	NP	579.90	na	579.90
BPP-24	585.29	NP	7.36	NP	577.93	na	577.93
BPP-25	*~ D E S T R O Y E D ~*						
BPP-26	584.29	NP	7.18	NP	577.11	na	577.11
BPP-27	*~ D E S T R O Y E D ~*						
P-18S	*~ D E S T R O Y E D ~*						
P-19S	584.58	NP	7.33	NP	577.25	na	577.25
P-20S	*~ D E S T R O Y E D ~*						

TABLE 2 (continued)

SUMMARY OF GROUNDWATER ELEVATIONS
December 8, 2017 (Y13SA1)

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)	"Pump Off" Probe Elevation (fmsl)	Corrected Groundwater Elevation [3] (fmsl)
MONITORING WELLS (13)							
MWN-09	584.78	NP	10.71	NP	574.07	na	574.07
MWN-19A	585.15	NP	8.04	NP	577.11	na	577.11
MWN-21A	583.85	NP	7.02	NP	576.83	na	576.83
MWN-27C	584.86	NP	6.72	NP	578.14	na	578.14
MWN-30A	585.43	NP	7.38	NP	578.05	na	578.05
MWN-31A	583.80	NP	6.95	NP	576.85	na	576.85
MWN-32A	587.04	NP	10.40	NP	576.64	na	576.64
MWN-45A	584.43	NP	9.65	NP	574.78	na	574.78
MWN-46A	582.62	NP	5.88	NP	576.74	na	576.74
MWN-47A	585.79	NP	10.79	NP	575.00	na	575.00
MWN-53A	584.19	NP	9.42	NP	574.77	na	574.77
MWN-54A	584.84	NP	9.48	NP	575.36	na	575.36
MWN-55A	*~ D E S T R O Y E D ~*						
MWN-55AR	585.59	NP	7.67	NP	577.92	na	577.92
STAFF GAUGES (1)							
SG-01 (canal)	581.90	NP	7.75	NP	574.15	na	574.15

Notes:

1. **BOLDED BLUE** wells have historically contained measureable free-phase product.
2. Ground and top of riser (TOR) elevations as surveyed by TurnKey on December 16, 2004.
3. Groundwater elevation corrected based on the presence of free product (i.e., LNAPL).
4. " Destroyed " = well/piezometer destroyed.
5. fbTOR = feet below top of riser.
6. fmsl = feet above mean sea level.
7. NP = no measureable product was present

TABLE 3

SUMMARY OF GROUNDWATER ELEVATIONS
May 11, 2018 (Y13SA2)

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)	"Pump Off" Probe Elevation (fmsl)	Corrected Groundwater Elevation [3] (fmsl)
RECOVERY WELLS (12)							
RW-1	583.03	9.49	9.50	0.01	573.53	573.00	573.54
RW-2	582.97	6.05	6.08	0.03	576.89	573.00	576.92
RW-3	582.61	NP	7.42	NP	575.19	na	575.19
RW-A	583.26	NP	5.57	NP	577.69	573.00	577.69
RW-B	584.06	NP	14.80	NP	569.26	573.00	569.26
RW-C	583.88	NP	9.34	NP	574.54	573.00	574.54
RW-D	583.76	NP	11.24	NP	572.52	573.00	572.52
RW-E	583.71	NP	7.50	NP	576.21	573.00	576.21
RW-F	583.68	7.45	7.61	0.16	576.07	573.00	576.20
RW-G	583.38	7.60	7.71	0.11	575.67	573.00	575.76
RW-H	583.11	7.49	7.75	0.26	575.36	573.00	575.58
RW-I	582.89	NP	13.63	NP	569.26	573.00	569.26
PIEZOMETERS (14)							
BPP-03	585.18	NP	7.55	NP	577.63	na	577.63
BPP-04	*~ D E S T R O Y E D ~*						
BPP-05	*~ D E S T R O Y E D ~*						
BPP-05R	585.18	NP	7.15	NP	578.03	na	578.03
BPP-06	583.42	8.21	8.73	0.52	574.69	na	575.12
BPP-07	*~ D E S T R O Y E D ~*						
BPP-08	*~ D E S T R O Y E D ~*						
BPP-09	*~ D E S T R O Y E D ~*						
BPP-13	584.69	8.83	9.31	0.48	575.38	na	575.78
BPP-17	584.73	8.18	8.30	0.12	576.43	na	576.53
BPP-18	585.38	NP	7.89	NP	577.49	na	577.49
BPP-19	585.67	NP	8.92	NP	576.75	na	576.75
BPP-20	585.73	NP	8.29	NP	577.44	na	577.44
BPP-21	586.33	NP	8.54	NP	577.79	na	577.79
BPP-22	585.57	NP	7.68	NP	577.89	na	577.89
BPP-23	586.19	NP	9.63	NP	576.56	na	576.56
BPP-24	585.29	NP	7.34	NP	577.95	na	577.95
BPP-25	*~ D E S T R O Y E D ~*						
BPP-26	584.29	NP	7.26	NP	577.03	na	577.03
BPP-27	*~ D E S T R O Y E D ~*						
P-18S	*~ D E S T R O Y E D ~*						
P-19S	584.58	NP	7.36	NP	577.22	na	577.22
P-20S	*~ D E S T R O Y E D ~*						

TABLE 3 (continued)

SUMMARY OF GROUNDWATER ELEVATIONS
May 11, 2018 (Y13SA2)

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)	"Pump Off" Probe Elevation (fmsl)	Corrected Groundwater Elevation [3] (fmsl)
MONITORING WELLS (13)							
MWN-09	584.78	NP	11.35	NP	573.43	na	573.43
MWN-19A	585.15	NP	8.03	NP	577.12	na	577.12
MWN-21A	583.85	NP	6.83	NP	577.02	na	577.02
MWN-27C	584.86	NP	6.73	NP	578.13	na	578.13
MWN-30A	585.43	NP	7.41	NP	578.02	na	578.02
MWN-31A	583.80	NP	7.51	NP	576.29	na	576.29
MWN-32A	587.04	NP	10.31	NP	576.73	na	576.73
MWN-45A	584.75	NP	10.18	NP	574.57	na	574.57
MWN-46A	584.75	NP	5.93	NP	578.82	na	578.82
MWN-47A	585.79	NP	11.28	NP	574.51	na	574.51
MWN-53A	584.19	NP	8.85	NP	575.34	na	575.34
MWN-54A	584.84	NP	9.42	NP	575.42	na	575.42
MWN-55A	*~ D E S T R O Y E D ~*						
MWN-55AR	585.59	NP	7.59	NP	578.00	na	578.00
STAFF GAUGES (1)							
SG-01 (canal)	581.90	NP	8.51	NP	573.39	na	573.39

Notes:

1. **BOLDED BLUE** wells have historically contained measureable free-phase product.
2. Ground and top of riser (TOR) elevations as surveyed by TurnKey on December 16, 2004.
3. Groundwater elevation corrected based on the presence of free product (i.e., LNAPL).
4. " Destroyed " = well/piezometer destroyed.
5. fbTOR = feet below top of riser.
6. fmsl = feet above mean sea level.
7. NP = no measureable product was present

TABLE 4

AIR STRIPPER INFLUENT/EFFLUENT ANALYTICAL DATA SUMMARY
YEAR 13 MONITORING PERIOD

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Parameter	CAS No.	Influent	Effluent	Influent	Effluent
		12-20-17 (Y13SA1)		4-19-18 (Y13SA2)	
TCL Volatile Organic Compounds (mg/L):					
Acetone	*67-64-1*	ND	0.0061	ND	0.0062
Benzene	*71-43-2*	27	ND	13	0.016
2-Butanone	*78-93-3*	ND	ND	ND	ND
Ethylbenzene	*100-41-4*	ND	ND	0.14 J	ND
1,2-Dichloroethane	*107-06-2*	0.63	ND	ND	ND
Methyl cyclohexane	*108-87-2*	ND	ND	ND	ND
Toluene	*108-88-3*	1 J	ND	0.33 J	ND
1,3,5-Trimethylbenzene	*108-67-8*	ND	ND	ND	ND
1,3,4-Trimethylbenzene	*95-63-6*	ND	ND	ND	ND
Xylenes, Total	*1330-20-7*	0.55 J	ND	0.54 J	0.00096 J
Total VOCs	--	29.18 J	0.0061	14.01	0.02316 J
		Percent Reduction:	***99.98%***	**Percent Reduction:**	***99.83%***

Notes:

1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. J = Estimated value. Result is less than the quantitation limit but greater than zero.
3. ND = parameter was not detected above laboratory reporting limit and is reported herein as not detected (ND).

TABLE 5

ESTIMATED MASS OF DISSOLVED-PHASE VOCs PER MONITORING EVENT
REMOVED FROM GOUNDWATER
Y13 ANNUAL EVENT

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Date of Collection	Event	Event	INFLUENT VOLATILE ORGANIC CONCENTRATION COMPOUND (mg/L)				Total VOCs (mg/L)	Moving Average (mg/L)	Treated Volume		Percent Reduction	APL Mass Removed Per Event (A x B x C)			LNAPL Mass Removed Per Event [1]			Total Mass Removed (APL & LNAPL) (pounds)	
			B	E	T	X		A	gallons	liters	C	mg	pounds	pounds (cumulative)	gallons	pounds	pounds (cumulative)	per event	cumulative
									B										
05/04/05	start-up	Apr-05	91 D	0.42	10 D	2.7	104.12	104.12	218,276	826,262	100%	86,030,396.36	190	190	0.00	0	0	190	190
05/31/05	M1	May-05	57 D	0.4	6.1 D	2.6	66.10	85.11	89,216	337,718	99.98%	28,737,451.31	63	253	19.92	146	146	210	399
06/30/05	M2	Jun-05	65 D	0.39	6.3 D	3	74.69	81.64	384,303	1,454,741	99.99%	118,748,295.49	262	515	9.35	69	215	330	730
08/04/05	M3	Aug-05	69 D	0.4 J	8.7	2.6	80.70	81.40	295,121	1,117,151	99.95%	90,893,417.55	200	715	6.13	45	260	245	975
08/29/05	M4	Aug-05	120 D	2.9 J	16	23	161.90	97.50	305,166	1,155,175	98.91%	111,404,221.74	246	961	3.74	27	287	273	1,248
09/23/05	M5	Sep-05	120 D	1.1 J	13	9.5 J	143.60	105.19	510,119	1,931,004	99.97%	203,051,770.59	448	1,409	139.74	1,025	1,312	1,473	2,721
10/31/05	M6	Oct-05	120 D	0.81 J	12	5.7 J	138.51	109.95	484,182	1,832,823	99.98%	201,470,681.43	444	1,853	44.82	329	1,641	773	3,494
12/05/05	Y1Q3	Dec-05	100 D	0.79 J	14	5.6 J	120.39	111.25	1,295,322	4,903,312	99.77%	544,244,928.85	1,200	3,053	74.93	550	2,191	1,750	5,244
04/10/07	Y1Q4	Apr-07	120	1 J	16	7.6 J	144.60	114.96	1,040,553	3,938,909	99.54%	450,720,988.56	994	4,047	99.60	731	2,922	1,725	6,968
07/10/07	Y2Q1	Jul-07	110	1.2 J	15	8.5 J	134.70	116.93	942,933	3,569,379	99.97%	417,245,795.23	920	4,967	80.51	591	3,512	1,511	8,479
10/30/07	Y2Q2	Oct-07	63	0.69 J	8.1	4.9 J	76.69	113.27	432,400	1,636,807	99.35%	184,200,452.05	406	5,373	77.19	566	4,079	972	9,452
01/18/07	Y2Q3	Jan-07	93	1.1	14	7.7	115.80	113.48	521,768	1,975,101	99.90%	223,916,857.31	494	5,867	34.86	256	4,334	749	10,201
04/16/07	Y2Q4	Apr-07	110	0.8	12	5.7	128.50	114.64	465,708	1,762,891	99.91%	201,913,233.74	445	6,312	19.92	146	4,481	591	10,792
10/19/07	Y3SA1	Oct-07	81	0.74 J	5.5	4.5	91.74	113.00	377,088	1,427,429	98.86%	159,464,685.36	352	6,664	51.72	379	4,860	731	11,524
04/10/08	Y3SA2	Apr-08	70	< 1	4.7	2.7 J	78.40	110.70	1,186,475	4,491,282	99.76%	495,973,802.94	1,094	7,757	126.58	929	5,789	2,022	13,546
11/17/08	Y4SA1	Nov-08	40	0.3 J	1.6	1.3 J	43.20	106.48	784,835	2,970,914	99.93%	316,114,104.11	697	8,454	31.96	234	6,023	932	14,477
04/08/09	Y4SA2	Apr-09	78 D	0.66 DJ	8.5 D	4.4 D	91.56	105.60	566,020	2,142,612	99.97%	226,191,960.65	499	8,953	7.47	55	6,078	554	15,031
11/13/09	Y5SA1	Nov-09	100 D	0.79 DJ	8.6 D	4.4 D	113.79	106.06	779,293	2,949,936	99.89%	312,511,292.04	689	9,642	13.30	98	6,175	787	15,818
04/29/10	Y5SA2	Apr-10	73 D	< 1	2.9 D	2.1 D	79.00	104.63	1,639,458	6,206,004	98.90%	642,198,015.52	1,416	11,058	12.32	90	6,266	1,506	17,324
10/22/10	Y6SA1	Oct-10	71 D	< 1	4.7 D	2.7 D	79.40	103.37	1,208,425	4,574,372	99.76%	471,715,704.63	1,040	12,098	26.79	197	6,462	1,237	18,561
04/26/11	Y6SA2	Apr-11	55	< 1	6.1	3.3	65.40	101.56	1,023,146	3,873,017	99.95%	393,152,451.47	867	12,965	43.00	315	6,778	1,182	19,743
10/28/11	Y7SA1	Oct-12	87	1.5	17	11	116.50	102.24	1,015,933	3,845,713	99.97%	393,069,466.27	867	13,832	70.08	514	7,292	1,381	21,124
05/01/12	Y7SA2	Apr-11	76	< 1	5.7	2.8	85.50	101.51	858,183	3,248,566	99.99%	329,737,424.85	727	14,559	43.84	322	7,614	1,049	22,173
10/03/12	Y8SA1	Oct-12	49	< 1	2.4	1.1 J	53.50	99.51	769,882	2,914,311	99.99%	289,980,190.29	639	15,198	36.93	271	7,885	910	23,083
04/04/13	Y8SA2	Apr-11	75 D	0.43 J	6.2	29.6	111.23	99.98	1,567,627	5,934,095	99.99%	593,236,260.39	1,308	16,506	38.85	285	8,170	1,593	24,676
10/30/13	Y9SA1	Oct-13	48	< 2.5	4.7	1.67 J	56.87	98.32	1,450,192	5,489,556	99.98%	539,639,942.60	1,190	17,696	42.64	313	8,482	1,503	26,179
04/21/14	Y9SA2	Apr-14	64	0.69 J	8.3	3.8	76.79	97.53	2,058,564	7,792,488	99.99%	759,887,855.02	1,676	19,372	57.85	424	8,907	2,100	28,279
10/30/14	Y10SA1	Oct-14	34	< 1.2	3.6	2.15 J	40.95	95.50	1,283,541	4,858,717	99.84%	463,287,606.38	1,022	20,393	35.66	262	9,168	1,283	29,562
04/30/15	Y10SA2	Apr-15	67	< 2.5	4.1	1.4 J	75.00	94.80	954,826	3,614,398	99.95%	342,464,920.14	755	21,149	35.11	258	9,426	1,013	30,575
04/05/16	Y11SA2	Apr-16	63	< 2.5	2.6	2.4 J	70.50	93.99	1,604,223	6,072,626	99.97%	570,580,698.66	1,258	22,407	8.63	63	9,489	1,321	31,896
10/26/16	Y12SA1	Oct-16	90	0.88 J	8.3	5.6 J	104.78	94.34	1,182,202	4,475,107	99.98%	422,078,437.75	931	23,337	24.00	176	9,665	1,107	33,003
04/05/17	Y12SA2	Apr-17	94	<2.5	9	3.68 J	106.68	94.72	1,629,980	6,170,126	99.98%	584,327,114.40	1,288	24,626	14.50	106	9,772	1,395	34,398
12/20/17	**Y13SA1**	**Dec-18**	**27**	**<2.5**	**1 J**	**0.55 J**	**28.55**	92.72	**1,059,020**	**4,008,814**	**99.98%**	**371,608,348.59**	**819**	**25,445**	**17.90**	**131**	**9,903**	**951**	**35,348**
04/19/18	**Y13SA2**	**Apr-18**	**13**	**0.14 J**	**0.33 J**	**0.54 J**	**14.01**	90.40	**1,010,477**	**3,825,060**	**99.83%**	**345,203,171.44**	**761**	**26,206**	**10.35**	**76**	**9,979**	**837**	**36,186**
								TOTALS:	**30,994,457**		**99.81%**		**26,206**		**1,360.19**	**9,979**		**36,186**	

Total Mass Removed: (APL & LNAPL) **36,186** **pounds**
18.09 **tons**

Notes:
1. LNAPL Mass removal conversion: 8.337 pounds/gallon of water x specific gravity of benzol (0.88) = 7.3366 pounds/gallon.
2. APL = aqueous-phase liquid; dissolved phase
3. LNAPL = light non-aqueous phase liquid; floats on water
4. B = benzene
5. E = ethylbenzene
6. T = toluene
7. X = total xylenes

= current monitoring period

TABLE 6

DOWNGRADIENT GROUNDWATER ANALYTICAL DATA SUMMARY [1,2]
YEAR 13 MONITORING PERIOD

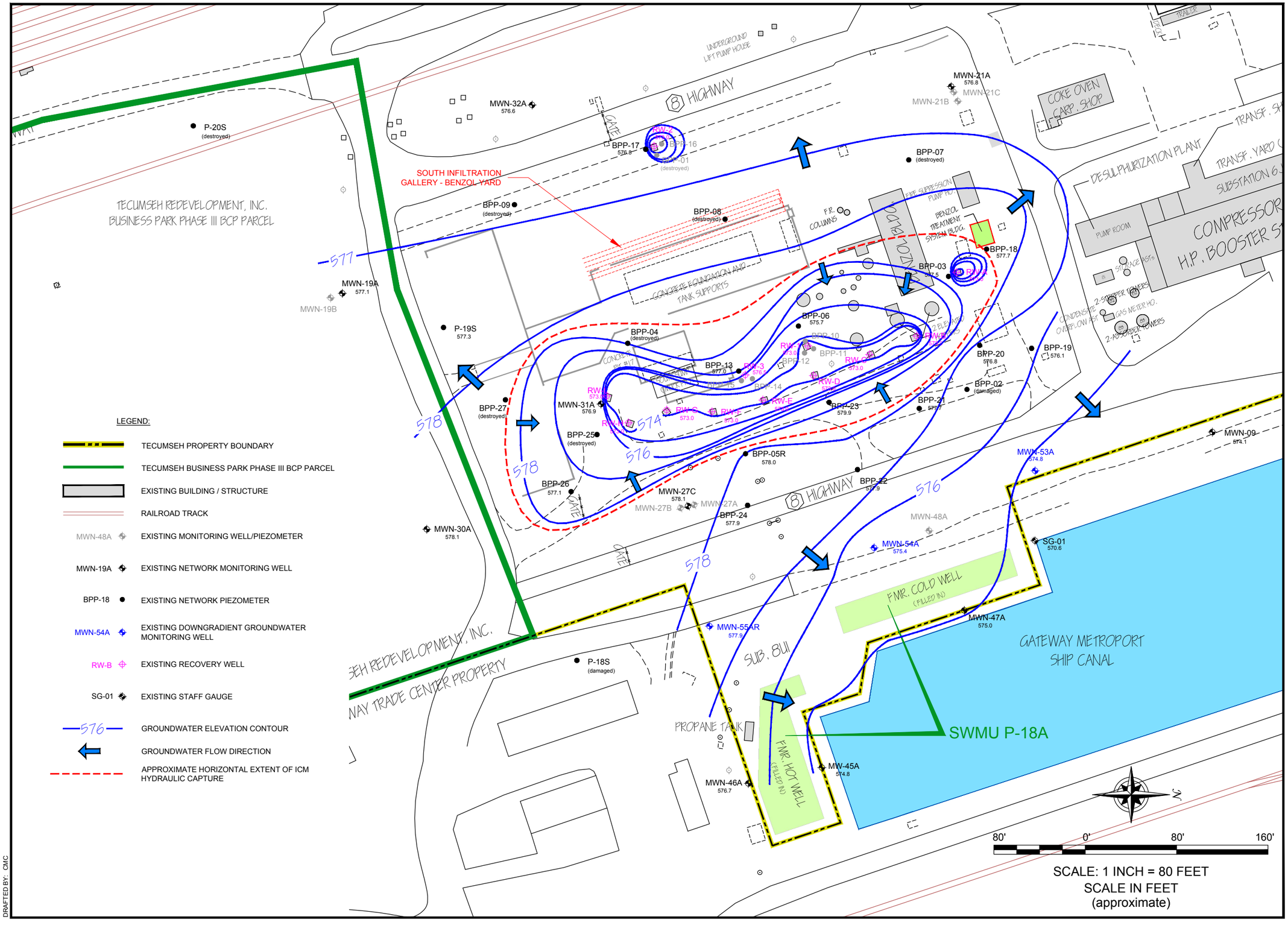
Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

PARAMETER	12/20/2017			4/18/2018			GWQS/GV [4]
	MWN-53A	MWN-54A	MWN-55AR	MWN-53A	MWN-54A	MWN-55AR	
Field Measurements [3]							
pH (units)	7.11	7.71	**11.03**	7.21	7.55	**11.90**	6.5 - 8.5
Temperature (^{o}C)	12.0	12.1	11.1	7.8	7.8	6.3	NA
Sp. Conductance (uS)	1403	2567	5179	1133	1355	3508	NA
Turbidity (NTU)	1.86	6.17	1.2	9.28	15.2	12	NA
Dissolved Oxygen (ppm)	3.98	2.64	1.71	1.85	1.48	1.51	NA
Eh (mV)	- 58	- 111	- 176	-85	-119	-225	NA
TCL Volatile Organic Compounds, Method 8260B (mg/L):							
1,2,4-Trimethylbenzene	ND	ND	0.0011 J	ND	ND	ND	0.005
Acetone	ND	ND	ND	0.0022 J	ND	0.0017 J	0.05
Benzene	ND	**44**	**0.067**	**0.023**	**86**	**0.1**	0.001
Ethylbenzene	ND	**0.55 J**	0.0021 J	ND	**0.94 J**	0.0018 J	0.005
1,2-Dichloroethane	ND	**1**	**0.0015**	ND	ND	ND	0.0006
Isopropylbenzene	ND	ND	0.0011 J	ND	ND	0.00096 J	0.005
Toluene	ND	ND	0.0021 J	ND	ND	0.0047	0.005
Xylenes, Total	ND	**1.85 J**	0.0034	ND	**2.66 J**	**0.0055 J**	0.005
Semi-Volatile Organic Compounds 8270 (SIM) (ng/L):							
1,4 - Dioxane	NA	NA	NA	NA	NA	295	NA
Perfluorinated Alkyl Acids (ng/L)							
Perfluorobutanoic acid (PFBA)	NA	NA	NA	NA	NA	75.2	NA
Perfluroropentanoic acid (PFPeA)	NA	NA	NA	NA	NA	257	NA
Perfluorobutanesulfonic Acid (PFBS)	NA	NA	NA	NA	NA	0.636 J	NA
Perflurorohexanoic acid (PFHxA)	NA	NA	NA	NA	NA	164	NA
Perfluroroheptanoic acid (PFHpA)	NA	NA	NA	NA	NA	53.1	NA
Perfluorooctanoic acid (PFOA)	NA	NA	NA	NA	NA	15.3	NA
1H,1H,2H,2H-Perfluorooctaneslfonic Acid (6:2FTS)	NA	NA	NA	NA	NA	19.7	NA
Perfluorononanoic acid (PFNA)	NA	NA	NA	NA	NA	4.98	NA
Perfluorooctanesulfonic acid (PFOS)	NA	NA	NA	NA	NA	4.76	NA
Perfluorodecanoic Acid (PFDA)	NA	NA	NA	NA	NA	3.75	NA
1H,1H,2H,2H-Perfluorodecanessulfonic Acid (8:2FTS)	NA	NA	NA	NA	NA	0.778 J	NA

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. Shaded values represent exceedances of the GWQS.
3. Field measurements were collected immediately before groundwater sample collection.
4. NYSDEC Class "GA" Groundwater Quality Standards/Guidance Values (GWQS/GV) as per 6 NYCRR Part 703.
5. J = Estimated value
6. "NA" = Not Applicable; a GWQS/GV has not been established for this compound.
7. "ND" indicates parameter was not detected above laboratory reporting limit and is reported herein as not detected (ND).

FIGURES

F:\CAD\TurnKey\Tecumseh Redevelopment\Corrective Measures\ICM - Benzol Plant\PERFORMANCE & GWM REPORTS\Y13\SA2 (May 2016)\Figure 1 - Site Plan (isopotential map)_Dec 2017.dwg



LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- TECUMSEH BUSINESS PARK PHASE III BCP PARCEL
- EXISTING BUILDING / STRUCTURE
- RAILROAD TRACK
- MWN-48A — EXISTING MONITORING WELL/PIEZOMETER
- MWN-19A — EXISTING NETWORK MONITORING WELL
- BPP-18 — EXISTING NETWORK PIEZOMETER
- MWN-54A — EXISTING DOWNGRADIENT GROUNDWATER MONITORING WELL
- RW-B — EXISTING RECOVERY WELL
- SG-01 — EXISTING STAFF GAUGE
- 576 — GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE HORIZONTAL EXTENT OF ICM HYDRAULIC CAPTURE

DATE: JUNE 2012
DRAFTED BY: CMC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

TurnKey Environmental Restoration, LLC

JOB NO.: 0071-017-910

GROUNDWATER ISOPOTENTIAL MAP DECEMBER 8, 2017

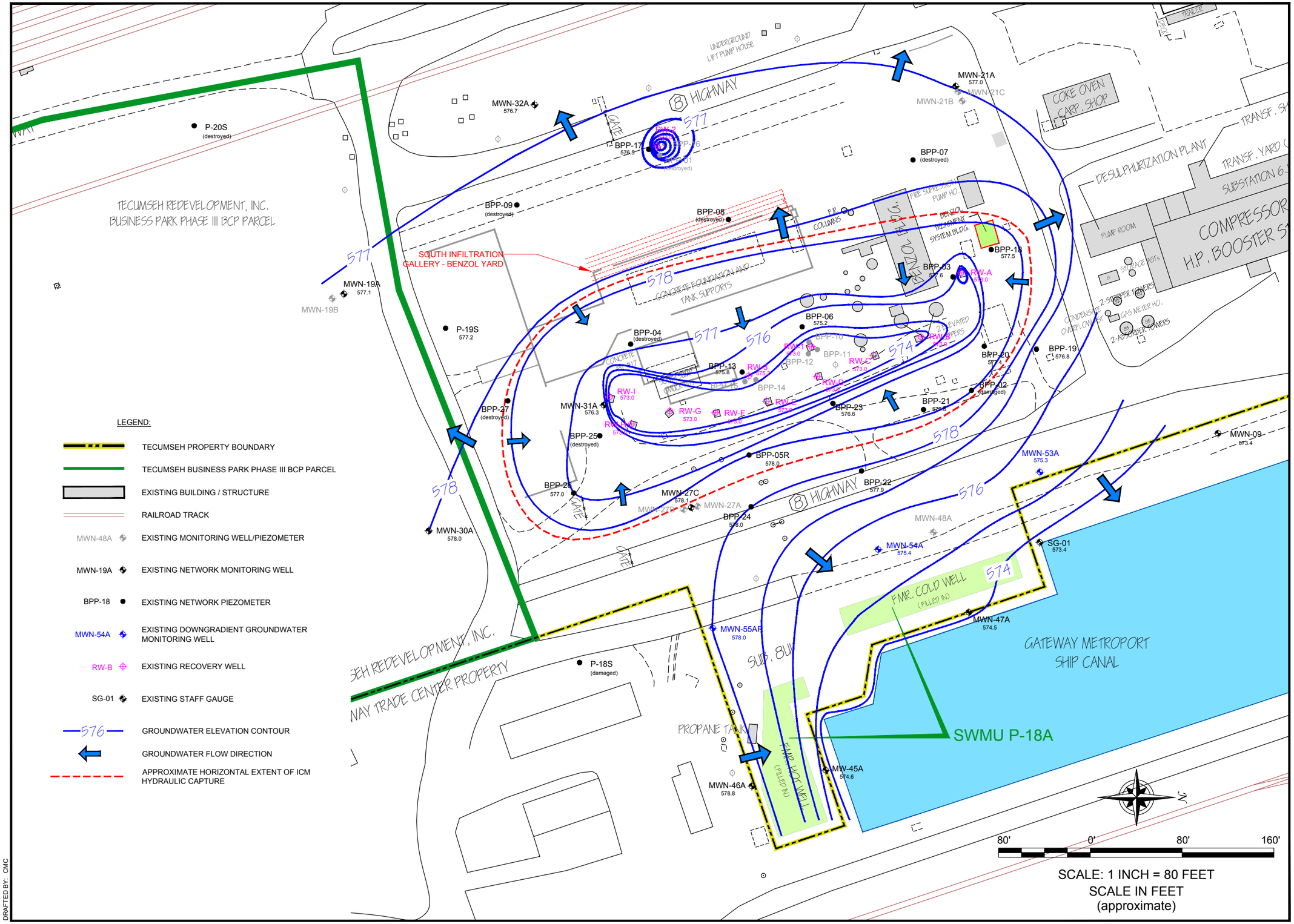
BENZOL PLANT - INTERIM CORRECTIVE MEASURES

FORMER BETHLEHEM STEEL LACKAWANNA COKE DIVISION SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 1

F:\CAD\TurnKey\Tecumseh Redevelopment\Corrective Measures\ICM - Benzol Plant\PERFORMANCE & GWM REPORTS\Y13\SA2 (May 2018)\Figure 2; Site Plan (isopotential map)_May 2018.dwg



LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- TECUMSEH BUSINESS PARK PHASE III BCP PARCEL
- EXISTING BUILDING / STRUCTURE
- RAILROAD TRACK
- MWN-48A — EXISTING MONITORING WELL/PIEZOMETER
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- GROUNDWATER FLOW DIRECTION
- APPROXIMATE HORIZONTAL EXTENT OF ICM HYDRAULIC CAPTURE

DATE: JUNE 2018
DRAFTED BY: CMC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

JOB NO.: 0071-017-910

GROUNDWATER ISOPOTENTIAL MAP
MAY 11, 2018

BENZOL PLANT - INTERIM CORRECTIVE MEASURES

FORMER BETHLEHEM STEEL LACKAWANNA COKE DIVISION SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 2

ATTACHMENT 1

INTERIM CORRECTIVE MEASURES PROCESS LOG

ATTACHMENT 1-1

SYSTEM WATER FLOW DATA
YEAR 13 MONITORING PERIOD

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Date	Report Period	Operator Initials	Air Stripper						
			Total Influent Flow (gal)	Total Influent Flow This Period (gal)	Monthly Total Flow	Total Effluent Flow to SIG (gal)	Total Effluent Flow to SIG This Period (gal)	Total Effluent Flow to NIG (gal)	Total Effluent Flow to NIG This Period (gal)
05/01/17	Y13SA1	MLJ	28,956,860	31,900	351,080	3,310,845	0	25,646,015	31,900
05/04/17		MLJ	28,997,840	40,980		3,310,845	0	25,686,995	40,980
05/09/17		BMG	29,067,850	70,010		3,310,845	0	25,757,005	70,010
05/15/17		MLJ	29,144,940	77,090		3,310,845	0	25,834,095	77,090
05/19/17		MLJ	29,174,760	29,820		3,310,845	0	25,863,915	29,820
05/22/17		MLJ	29,203,670	28,910		3,310,845	0	25,892,825	28,910
05/26/17		MLJ	29,236,310	32,640		3,310,845	0	25,925,465	32,640
05/30/17		MLJ	29,276,040	39,730		3,310,845	0	25,965,195	39,730
06/02/17		MLJ	29,301,080	25,040	172,520	3,310,845	0	25,990,235	25,040
06/06/17		MLJ	29,307,060	5,980		3,310,845	0	25,996,215	5,980
06/08/17		MLJ	29,324,460	17,400		3,310,845	0	26,013,615	17,400
06/12/17		MLJ	29,352,010	27,550		3,310,845	0	26,041,165	27,550
06/16/17		MLJ	29,378,730	26,720		3,310,845	0	26,067,885	26,720
06/19/17		MLJ	29,399,080	20,350		3,310,845	0	26,088,235	20,350
06/22/17		MLJ	29,414,680	15,600		3,310,845	0	26,103,835	15,600
06/27/17		MLJ	29,442,580	27,900		3,310,845	0	26,131,735	27,900
06/29/17		MLJ	29,448,560	5,980		3,310,845	0	26,137,715	5,980
07/06/17		MLJ	29,485,450	36,890	158,240	3,310,845	0	26,174,605	36,890
07/11/17		MLJ	29,509,770	24,320		3,310,845	0	26,198,925	24,320
07/13/17		MLJ	29,517,670	7,900		3,310,845	0	26,206,825	7,900
07/20/17		BMG	29,561,090	43,420		3,310,845	0	26,250,245	43,420
07/25/17		BMG	29,594,810	33,720		3,310,845	0	26,283,965	33,720
07/28/17		BMG	29,606,800	11,990		3,310,845	0	26,295,955	11,990
08/02/17		BMG	29,622,590	15,790	158,160	3,310,845	0	26,311,745	15,790
08/08/17		BMG	29,644,080	21,490		3,310,845	0	26,333,235	21,490
08/17/17		BMG	29,692,570	48,490		3,310,845	0	26,381,725	48,490
08/23/17		BMG	29,730,630	38,060		3,310,845	0	26,419,785	38,060
08/31/17		BMG	29,764,960	34,330		3,310,845	0	26,454,115	34,330
09/08/17		BMG	29,800,420	35,460	120,350	3,310,845	0	26,489,575	35,460
09/13/17		BMG	29,822,490	22,070		3,310,845	0	26,511,645	22,070
09/19/17		BMG	29,851,080	28,590		3,310,845	0	26,540,235	28,590
09/25/17		CEH	29,875,630	24,550		3,310,845	0	26,564,785	24,550
09/28/17		CEH	29,885,310	9,680		3,310,845	0	26,574,465	9,680
10/02/17		CEH	29,895,530	10,220	98,670	3,310,845	0	26,584,685	10,220
10/06/17		CEH	29,895,530	0		3,310,845	0	26,584,685	0
10/09/17		CEH	29,907,710	12,180		3,310,845	0	26,596,865	12,180
10/12/17		CEH	29,919,810	12,100		3,310,845	0	26,608,965	12,100
10/17/17		CEH	29,937,760	17,950		3,310,845	0	26,626,915	17,950
10/20/17		CEH	29,948,650	10,890		3,310,845	0	26,637,805	10,890
10/24/17		CEH	29,963,670	15,020		3,310,845	0	26,652,825	15,020
10/26/17		CEH	29,969,430	5,760		3,310,845	0	26,658,585	5,760
10/30/17		CEH	29,983,980	14,550		3,310,845	0	26,673,135	14,550
11/01/17	Y13SA2	CEH	30,002,280	18,300	154,110	3,310,845	0	26,691,435	18,300
11/06/17		CEH	30,054,690	52,410		3,310,845	0	26,743,845	52,410
11/09/17		CEH	30,091,400	36,710		3,310,845	0	26,780,555	36,710
11/13/17		CEH	30,099,070	7,670		3,310,845	0	26,788,225	7,670
11/16/17		CEH	30,124,190	25,120		3,310,845	0	26,813,345	25,120
11/20/17		CEH	30,132,550	8,360		3,310,845	0	26,821,705	8,360
11/22/17		CEH	30,136,940	4,390		3,310,845	0	26,826,095	4,390
11/27/17		CEH	30,138,090	1,150		3,310,845	0	26,827,245	1,150
12/04/17		CEH	30,149,080	10,990	72,040	3,310,845	0	26,838,235	10,990
12/07/17		CEH	30,157,820	8,740		3,310,845	0	26,846,975	8,740
12/11/17		CEH	30,165,820	8,000		3,310,845	0	26,854,975	8,000
12/18/17		CEH	30,166,380	560		3,310,845	0	26,855,535	560
12/21/17		CEH	30,193,580	27,200		3,310,845	0	26,882,735	27,200
12/28/17		CEH	30,210,130	16,550		3,310,845	0	26,899,285	16,550
01/03/18		CEH	30,217,865	7,735	146,474	3,310,845	0	26,907,020	7,735
01/05/18		CEH	30,230,034	12,169		3,323,014	12,169	26,907,020	0
01/08/18		CEH	30,245,083	15,049		3,338,063	15,049	26,907,020	0
01/11/18		BMG	30,255,021	9,938		3,348,001	9,938	26,907,020	0
01/15/18		CEH	30,259,707	4,686		3,348,001	0	26,911,706	4,686
01/15/18		BMG	30,262,427	2,720		3,348,001	0	26,914,426	2,720
01/18/18		CEH	30,291,466	29,039		3,348,001	0	26,943,465	29,039
01/22/18		CEH	30,316,100	24,634		3,348,001	0	26,968,099	24,634
01/25/18		CEH	30,335,900	19,800		3,348,001	0	26,987,899	19,800
01/29/18		CEH	30,356,604	20,704		3,348,001	0	27,008,603	20,704

ATTACHMENT 1-1

SYSTEM WATER FLOW DATA
YEAR 13 MONITORING PERIOD

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Date	Report Period	Operator Initials	Air Stripper						
			Total Influent Flow (gal)	Total Influent Flow This Period (gal)	Monthly Total Flow	Total Effluent Flow to SIG (gal)	Total Effluent Flow to SIG This Period (gal)	Total Effluent Flow to NIG (gal)	Total Effluent Flow to NIG This Period (gal)
02/01/18	Y13SA2	CEH	30,373,453	16,849	252,895	3,348,001	0	27,025,452	16,849
02/05/18		CEH	30,421,661	48,208		3,348,001	0	27,073,660	48,208
02/08/18		CEH	30,444,014	22,353		3,348,001	0	27,096,013	22,353
02/12/18		CEH	30,470,796	26,782		3,348,001	0	27,122,795	26,782
02/16/18		CEH	30,502,366	31,570		3,348,001	0	27,154,365	31,570
02/19/18		CEH	30,518,381	16,015		3,348,001	0	27,170,380	16,015
02/23/18		CEH	30,568,844	50,463		3,348,001	0	27,220,843	50,463
02/26/18		CEH	30,609,499	40,655		3,348,001	0	27,261,498	40,655
03/01/18		CEH	30,625,020	15,521	176,956	3,348,001	0	27,277,019	15,521
03/05/18		CEH	30,650,552	25,532		3,348,001	0	27,302,551	25,532
03/08/18		CEH	30,664,885	14,333		3,348,001	0	27,316,884	14,333
03/12/18		CEH	30,692,744	27,859		3,348,001	0	27,344,743	27,859
03/15/18		CEH	30,712,015	19,271		3,348,001	0	27,364,014	19,271
03/19/18		CEH	30,725,830	13,815		3,348,001	0	27,377,829	13,815
03/22/18		CEH	30,734,609	8,779		3,348,001	0	27,386,608	8,779
03/26/18		CEH	30,762,835	28,226		3,348,001	0	27,414,834	28,226
03/29/18		CEH	30,786,455	23,620		3,348,001	0	27,438,454	23,620
04/02/18		CEH	30,813,177	26,722	208,002	3,348,001	0	27,465,176	26,722
04/05/18		CEH	30,847,720	34,543		3,348,001	0	27,499,719	34,543
04/09/18		CEH	30,877,134	29,414		3,348,001	0	27,529,133	29,414
04/12/18		CEH	30,907,670	30,536		3,348,001	0	27,559,669	30,536
04/16/18		CEH	30,922,604	14,934		3,348,001	0	27,574,603	14,934
04/20/18		CEH	30,940,460	17,856		3,348,001	0	27,592,459	17,856
04/23/18		CEH	30,973,458	32,998		3,348,001	0	27,625,457	32,998
04/26/18		CEH	30,994,457	20,999		3,348,001	0	27,646,456	20,999

Notes: SIG = south infiltration gallery
NIG = north infiltration gallery
NM = not measured

= current monitoring period

Y13 TOTAL:	2,069,497	gallons	100%
Y13 discharge to NIG:	2,032,341	gallons	98.2%
Y13 discharge to SIG:	37,156	gallons	1.8%
Total Flow to NIG Since Start-up:	27,646,456	gallons	89%
Total Flow to SIG Since Start-up:	3,348,001	gallons	11%
System Flow TOTAL:	30,994,457	gallons	

ATTACHMENT 1-2

PRODUCT RECOVERY SUMMARY
YEAR 13 MONITORING PERIOD

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Date	Report Period	Operator Initials	Monitoring Location and Quantity (gallons)												
			RW-1	RW-2	RW-A	RW-B	RW-C	RW-D	RW-E	RW-F	RW-I	RW-G	BPP-08	BPP-14	BPP-17	BPP-23
05/22/17	Y13SA1	MLJ	--	2.50	--	--	--	--	--	--	--	--	--	--	--	--
06/19/17		MLJ	--	2.00	--	--	--	--	--	1.50	--	3.00	--	--	--	--
07/28/17		BMG	1.50	3.50	--	--	--	--	--	--	--	--	--	--	--	--
08/30/17		CFD	--	1.40	--	--	--	--	--	--	--	--	--	--	--	--
09/15/17		CFD	--	1.00	--	--	--	--	--	--	--	--	--	--	--	--
10/25/17		CFD	--	--	--	--	--	--	--	--	--	1.50	--	--	--	--
11/27/17	Y13SA2	CEH	--	--	--	--	--	--	--	0.50	--	--	--	--	--	--
12/28/17		CFD	--	--	--	--	--	--	--	0.70	0.25	--	--	--	--	--
01/31/18		CFD	--	1.00	--	--	--	--	--	0.30	--	0.50	--	--	--	0.30
02/13/18		CFD	0.50	--	--	--	--	--	--	0.60	--	0.10	--	--	0.10	--
03/20/18		CEH	--	1.50	--	--	--	--	--	1.00	--	1.00	--	--	--	--
04/23/18		CEH	--	1.00	--	--	--	--	--	0.75	--	0.25	--	--	--	--
Y13 SUBTOTAL:			**2.00**	**13.90**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.35**	**0.25**	**6.35**	**0.00**	**0.00**	**0.10**	**0.30**
SUBTOTAL (since start-up):			**111.16**	**1032.77**	**1.00**	**6.65**	**97.14**	**19.14**	**2.75**	**73.27**	**0.75**	**12.48**	**0.30**	**0.05**	**0.40**	**2.46**
Y13 TOTALS:			**28.25 gallons or 207.26 pounds**													
TOTAL (since start-up):			**1360.30 gallons or 9,979.93 pounds**													

Notes:

1. " -- " = no product was recovered from this location.

= current monitoring period

ATTACHMENT 2

PROJECT FIELD FORMS

TABLE 3

SUMMARY OF GROUNDWATER ELEVATIONS

12-8-17 (insert date of measurement here)

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Lackawanna, New York

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater [8] Elevation (fmsl)	Corrected Groundwater Elevation [3] (fmsl)
RECOVERY WELLS (12)						
RW-1	583.03		6.50	0.00	583.03	583.03
RW-2	582.97		5.791	0.00	582.97	582.97
RW-3	582.61	Taken 12-22-17 →	6.16	0.00	582.61	582.61
RW-A	583.26		6.40	0.00	583.26	583.26
RW-B	584.06		7.49	0.00	584.06	584.06
RW-C	583.88	10.51	10.52	0.00	583.88	583.88
RW-D	583.76		5.44	0.00	583.76	583.76
RW-E	583.71		7.54	0.00	583.71	583.71
RW-F	583.68	5.51	5.68	0.00	583.68	583.68
RW-G	583.38	7.11	7.18	0.00	583.38	583.38
RW-H	583.11		7.11	0.00	583.11	583.11
RW-I	582.89	11.41	11.43	0.00	582.89	582.89
PIEZOMETERS (22)						
BPP-03	585.18		7.64	0.00	585.18	585.18
BPP-04	~ D E S T R O Y E D ~					
BPP-05	585.18		7.16	0.00	585.18	585.18
BPP-06	583.42	7.70	7.71	0.00	583.42	583.42
BPP-07	~ D E S T R O Y E D ~					
BPP-08	~ D E S T R O Y E D ~					
BPP-09	~ D E S T R O Y E D ~					
BPP-13	584.69	7.70	7.71	0.00	584.69	584.69
BPP-17	584.73		7.98	0.00	584.73	584.73
BPP-18	585.38		7.73	0.00	585.38	585.38
BPP-19	585.67		9.58	0.00	585.67	585.67
BPP-20	585.73		8.90	0.00	585.73	585.73
BPP-21	586.33		8.65	0.00	586.33	586.33
BPP-22	585.57		7.70	0.00	585.57	585.57
BPP-23	586.19		6.39	0.00	586.19	586.19
BPP-24	585.29		7.36	0.00	585.29	585.29
BPP-25	~ D E S T R O Y E D ~					
BPP-26	584.29		7.15	0.00	584.29	584.29
BPP-27	~ D E S T R O Y E D ~					
P-18S	~ D E S T R O Y E D ~					
P-19S	584.58		7.33	0.00	584.58	584.58
P-20S	~ D E S T R O Y E D ~					
STAFF GAUGES (1)						

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 3

SUMMARY OF GROUNDWATER ELEVATIONS

12-8-17 (insert date of measurement here)

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Lackawanna, New York

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater [8] Elevation (fmsl)	Corrected Groundwater Elevation [3] (fmsl)
SG-01 (canal)	581.90		7.75	0.00	581.90	581.90
MONITORING WELLS (13)						
MWN-09	584.78		10.71	0.00	584.78	584.78
MWN-19A	585.15		8.04	0.00	585.15	585.15
MWN-21A	583.85		7.02	0.00	583.85	583.85
MWN-27C	584.86		6.72	0.00	584.86	584.86
MWN-30A	585.43		7.38	0.00	585.43	585.43
MWN-31A	583.80		6.95	0.00	583.80	583.80
MWN-32A	587.04		10.40	0.00	587.04	587.04
MWN-45A	584.43		9.65	0.00	584.43	584.43
MWN-46A	582.62		5.88	0.00	582.62	582.62
MWN-47A	585.79		10.79	0.00	585.79	585.79
MWN-53A	584.19		9.12	0.00	584.19	584.19
MWN-54A	585.84		9.48	0.00	585.84	585.84
MWN-55AR	585.59		7.67	0.00	585.59	585.59

Notes:

1. **BOLDED BLUE** wells have historically contained free-phase product.
2. Ground and top of riser (TOR) elevations as surveyed by TurnKey on December 16, 2004.
3. Groundwater elevation corrected based on the presence of free product (i.e., LNAPL).
4. " Destroyed " = well/piezometer destroyed; replacement well/piezometer will be installed upon completion of asbestos abatement within the Benzol Plant Area
5. fbTOR = feet below top of riser.
6. fmsl = feet above mean sea level.
7. NP = no measureable product was present
8. Monitoring Well

= product has been historically measured within this well/piezometer
= depth to water/product measurement inserted here

GROUNDWATER FIELD FORM

Project Name: Benzol Plant ICM
Location: Tecumseh Lackawanna Site
Project No.: 0071-017-910
Date: 12-20-17
Field Team: CEH

Well No. MWN-53A

Product Depth (fbTOR):
DTW (static) (fbTOR): 9.25
Total Depth (fbTOR): 18.14

Diameter (inches): 2
Water Column (ft): 8.89
One Well Volume (gal): 1.45
Total Volume Purged (gal):

Sample Date / Time: 12-20-17 / 1030
DTW when sampled: 10.81'
Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
Method: Dedicated tubing and submersible pump

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1000	0 Initial	2.20	6.70	11.2	1615	>1000	3.30	29	Turbid, no odor
1005	1 10.61	1.00	6.97	11.0	1419	45.9	4.02	-14	clear, no odor
1010	2 10.61	2.00	7.04	11.0	1453	8.41	4.13	-41	" " "
1015	3 10.74	3.00	7.07	12.0	1414	4.15	4.07	-50	" " "
1020	4 10.80	4.00	7.10	12.0	1405	3.12	4.04	-55	" " "
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1030	S1 10.81	5.00	7.11	12.0	1403	1.86	3.98	-58	clear, no odor
1040	S2 10.81	8.00	7.03	12.0	1398	2.32	3.79	-61	" " "

Well No. MWN-54A

Product Depth (fbTOR):
DTW (static) (fbTOR): 9.35
Total Depth (fbTOR): 20.31

Diameter (inches): 2
Water Column (ft): 10.96
One Well Volume (gal): 1.79
Total Volume Purged (gal):

Sample Date / Time: 12-20-17 / 1130
DTW when sampled: 9.96'
Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
Method: Dedicated tubing and submersible pump

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1050	0 Initial	2.20	7.54	11.7	2596	46.0	3.43	-24	clear, slight petrol odor
1056	1 9.93	2.00	7.60	12.1	2544	13.70	2.77	-72	" " "
1103	2 9.94	3.50	7.60	12.3	2543	10.20	3.02	-83	" " "
1108	3 9.94	4.50	7.69	11.9	2569	16.50	2.83	-100	" " "
1110	4 9.96	5.00	7.67	12.0	2582	8.27	2.76	-107	" " "
1115	5 9.96	6.00	7.66	12.0	2562	8.96	2.67	-110	" " "
	6								
	7								
	8								
	9				583.29				
	10				583.03				
Sample Information:					## 2567				
1130	S1 9.96	8.00	7.71	12.1	[illegible]	6.17	2.64	-111	clear, slight petrol odor
1140	S2 9.96	10.00	7.66	12.1	2571	4.64		-114	" " "

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

GROUNDWATER FIELD FORM

Project Name: Benzol Plant ICM
Location: Tecumseh Lackawanna Site
Project No.: 0071-017-910
Date: 12-20-17
Field Team: CEH

Well No. MWN-55AR			Diameter (inches): 2			Sample Date / Time: 12-20-17 / 1230			
Product Depth (fbTOR):			Water Column (ft): 4.16			DTW when sampled: 8.52			
DTW (static) (fbTOR): 7.15			One Well Volume (gal): 0.68			Purpose: ☐ Development ☐ Sample ☑ Purge & Sample			
Total Depth (fbTOR): 11.31			Total Volume Purged (gal):			Method: Dedicated tubing and submersible pump			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1150	0 Initial	2.20	12.33	12.3	4152	39.7	2.09	-221	clear, slight odor
1156	1 8.49	1.50	12.47	12.0	4612	12.8	1.69	-210	clear, "
1159	2 8.49	2.50	12.12	11.9	5052	7.08	1.38	-200	" " "
1203	3 8.52	4.00	11.66	10.9	5121	3.43	1.44	-181	" " "
1208	4 8.51	5.00	11.30	11.3	5159	1.74	1.70	-185	" " "
1213	5 8.51	6.00	11.13	11.2	5169	1.50	1.83	-180	" " "
1218	6 8.51	7.00	11.06	11.1	5186	1.71	1.86	-177	" " "
1223	7 8.52	8.00	11.04	11.0	5189	1.11	1.80	-179	" " "
	8								
	9								
	10								
Sample Information:									
1230	S1 8.52	9.00	11.03	11.1	5179	1.20	1.71	-176	clear, slight odor
1240	S2 8.52	11.00	11.00	11.1	5183	1.10	1.83	-180	" " "

Well No.			Diameter (inches):			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			One Well Volume (gal):			Purpose: ☐ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR):			Total Volume Purged (gal):			Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9				583.29				
	10				583.03				
Sample Information:					##				
	S1				582.63				
	S2								

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name: Benzol Plant ICM

Project No.: 0071-017-910

Client: Tecumseh Redevelopment, Inc.

Location: Former Benzol Plant Tank Storage Area (SWMU P-11)

SAMPLE DESCRIPTION

I.D.: **Influent**

Matrix: ☐ SURFACE WATER ☐ STORM ☐ SEEP ☑ GROUNDWATER

SAMPLE INFORMATION

Date Collected: 12-20-17

Time Collected: 1400

Date Shipped to Lab: 12-21-17

Collected By: CEH

Sample Type: ☐ POINT ☑ GRAB ☐ COMPOSITE

Sample Collection Method: ☐ DIRECT DIP ☐ POLY. DISP. BAILER ☐ SS / POLY. DIPPER ☐ ISCO SAMPLER ☐ PERISTALTIC PUMP ☑ OTHER, SAMPLE PORT

SAMPLING INFORMATION

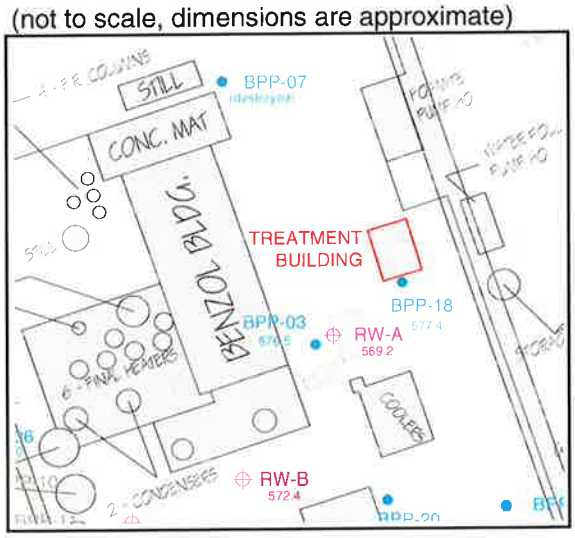
Weather: Cloudy

Air Temperature: 34° F

Parameter	First	Last	Units
pH	--	--	units
Temp.	--	--	°C
Cond.	--	--	mS
Turbidity	--	--	NTU
Eh / ORP	--	--	mV
D.O.	--	--	ppm
Odor	--	--	olfactory
Appearance	--	--	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)
NA	NA	NA

SAMPLE DESCRIPTION (appearance, olfactory):

SAMPLE ANALYSIS (depth, laboratory analysis required):

Target Compound List (TCL) volatile organic compounds (VOCs) per USEPA Method 8260B

ADDITIONAL REMARKS:

PREPARED BY: Chester Voorhees **DATE:** 12-20-17

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name: Benzol Plant ICM

Project No.: 0071-017-910

Client: Tecumseh Redevelopment, Inc.

Location: Former Benzol Plant Tank Storage Area (SWMU P-11)

SAMPLE DESCRIPTION

I.D.: **Effluent**

Matrix: ☐ SURFACE WATER ☐ STORM ☐ SEEP ☑ GROUNDWATER

SAMPLE INFORMATION

Date Collected: 12-20-17

Time Collected: 1410

Date Shipped to Lab: 12-21-17

Collected By: CEH

Sample Type: ☐ POINT ☑ GRAB ☐ COMPOSITE

Sample Collection Method: ☐ DIRECT DIP ☐ POLY. DISP. BAILER ☐ SS / POLY. DIPPER ☐ ISCO SAMPLER ☐ PERISTALTIC PUMP ☑ OTHER, SAMPLE PORT

SAMPLING INFORMATION

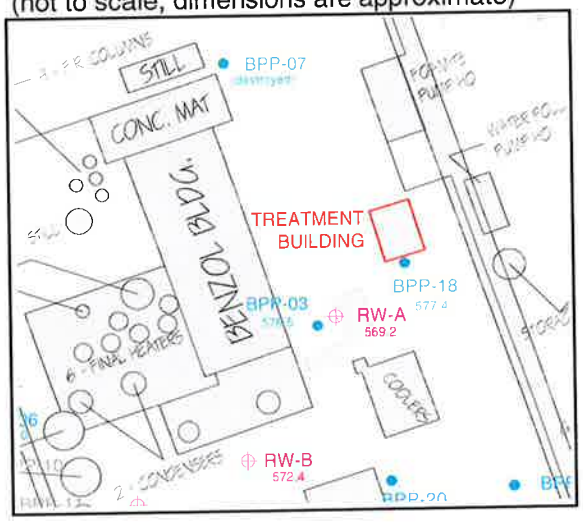
Weather: Cloudy

Air Temperature: 34°F

Parameter	First	Last	Units
pH	--	--	units
Temp.	--	--	°C
Cond.	--	--	mS
Turbidity	--	--	NTU
Eh / ORP	--	--	mV
D.O.	--	--	ppm
Odor	--	--	olfactory
Appearance	--	--	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)
NA	NA	NA

SAMPLE DESCRIPTION (appearance, olfactory):

SAMPLE ANALYSIS (depth, laboratory analysis required):

Target Compound List (TCL) volatile organic compounds (VOCs) per USEPA Method 8260B

ADDITIONAL REMARKS:

PREPARED BY: Chester Harbuster **DATE:** 12-20-17

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: Benzol Plant ICM

Project No.: T0071-017-910

Client: Tecumseh

Date: 12-20-17

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	945	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [ ] 6212375 [X] 6223973 [ ]	CEH	4.00 7.00 10.01	3.98 7.06 10.01	
[X] Turbidity meter	NTU	955	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) [ ] 13120C030432 (Q) [X]	CEH	< 0.4 or 10 for 2100 Q 20 100 800	10.8 22.9 99.9 810	
[ ] Turbidity meter	NTU		LaMotte 2020	6523-1816 (La) [ ]		0.0 NTU 1.0 NTU 10.0 NTU		
[X] Sp. Cond. meter	uS mS	945	Myron L Company Ultra Meter 6P	6213516 [ ] 6243084 [ ] 6212375 [ ] 6223973 [ ]	CEH	1413 mS @ 25 °C	1410	
[ ] PID	ppm		MinRAE 2000			open air zero _____ ppm Iso. Gas		MIBK response factor = 1.0
[X] Dissolved Oxygen	ppm	1000	HACH Model HQ30d	080700023281 [ ] 100500041867 [ ] 140200100319 [ ]	CEH	100% Satuartion	100%	
[ ] Particulate meter	mg/m^3					zero air		
[ ] Oxygen	%					open air		
[ ] Hydrogen sulfide	ppm					open air		
[ ] Carbon monoxide	ppm					open air		
[ ] LEL	%					open air		
[ ] Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: CEH **DATE:** 12-20-17

GROUNDWATER FIELD FORM

Project Name: Benzol Plan ICM Date: 4-18-18

Location: Tecumseh Lackawanna Site Project No.: 0071-017-910 Field Team: BMG

Well No. MWN-53A

Product Depth (fbTOR): NR	Diameter (inches): 2	Sample Date / Time: 4-18-18 / 946
DTW (static) (fbTOR): 7.50	Water Column (ft): 10.64	DTW when sampled: 7.80
Total Depth (fbTOR): 18.14	One Well Volume (gal): 1.73	Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
	Total Volume Purged (gal): 1.2	Method: Dedicated tubing and submersible pump

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
938	0	Initial	0	6.99	6.9	1163	15.9	2.60	-41	clear, No odor
940	1	7.80	0.2	7.20	8.0	1166	11.3	1.79	-73	
942	2	7.85	0.4	7.18	8.2	1153	14.8	1.85	-85	
944	3	7.86	0.6	7.21	7.9	1143	14.3	1.62	-86	
	4									
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
946	S1	7.80	1.0	7.21	7.8	1133	9.24	1.85	-85	
950	S2	7.80	1.2	7.25	7.3	1124	5.89	1.85	-85	

Well No. MWN-54A

Product Depth (fbTOR): NA	Diameter (inches): 2	Sample Date / Time: 4-18-18 / 1022
DTW (static) (fbTOR): 8.32	Water Column (ft): 11.99	DTW when sampled: 8.54
Total Depth (fbTOR): 20.31	One Well Volume (gal): 1.95	Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
	Total Volume Purged (gal): 0.6	Method: Dedicated tubing and submersible pump

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1014	0	Initial	0	7.48	8.0	1458	29.2	1.64	-92	clear, Slight odor
1016	1	8.57	0.2	7.54	8.1	1391	16.6	1.24	-109	
1018	2	8.57	0.3	7.55	7.8	1369	13.8	1.15	-114	
1020	3	8.54	0.4	7.56	7.7	1357	14.6	1.11	-116	
	4									
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1022	S1	8.54	0.5	7.55	7.8	1355	15.2	1.10	-119	
1025	S2	8.57	0.6	7.55	8.1	1346	14.2	1.61	-122	

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: BMG

GROUNDWATER FIELD FORM

Project Name: Benzol Plan ICM | Date: 4-18-18

Location: Tecumseh Lackawanna Site | Project No.: 0071-017-910 | Field Team: BMG

Well No. MWN-55A			Diameter (inches): 2			Sample Date / Time: 4-18-18 / 1113			
Product Depth (fbTOR): NA			Water Column (ft): 10.28			DTW when sampled: 6.92			
DTW (static) (fbTOR): 6.54			One Well Volume (gal): 1.68			Purpose: ☐ Development ☐ Sample ☑ Purge & Sample			
Total Depth (fbTOR): 16.82			Total Volume Purged (gal):			Method: Dedicated tubing and submersible pump			

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1107	0 Initial	0	11.92	5.9	3485	22.5	3.03	-219	clear No odor
1109	1 6.94	0.2	11.91	6.1	3532	16.6	1.58	-226	
1111	2 6.92	0.3	11.94	6.2	3542	12.4	1.89	-231	
	3 6.92								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1113	S1 6.92	0.4	11.90	6.3	3503	12.0	1.51	-225	
1116	S2 8.00	0.6	11.75	6.4	3437	7.50	1.34	-216	

continued

Well No. MWN-55A			Diameter (inches): 2			Sample Date / Time: 4-18-18 / 1146			
Product Depth (fbTOR): NA			Water Column (ft): 10.28			DTW when sampled: 7.10			
DTW (static) (fbTOR): 7.95			One Well Volume (gal): 1.68			Purpose: ☐ Development ☐ Sample ☒ Purge & Sample			
Total Depth (fbTOR): 16.82			Total Volume Purged (gal):			Method: bailer after 1134			

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1124	0 Initial 7.15	1.7	11.44	6.4	3268	5.01	1.28	-99	clear No odor 1
1134	1 7.09	3.4	10.86	6.8	3180	5.20	104	-187	2 - bailer
1146	2 7.10	5.1	10.05	7.1	2796	5.44	1.78	-172	3
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
1155	S2 7.15	6.8	9.95	7.0	2921	9.61	1.65	-183	

1130

REMARKS: FB through bailer with string inside
1124 - 1155 purge and sample for PFOA's only

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: Brock Greene

GROUNDWATER FIELD FORM

Project Name: PFCs | Date: 4-18-18

Location: Tecumseh Lackawanna Site | Project No.: 0071-017-910 | Field Team:

Well No. MWN-11			Diameter (inches): 4"			Sample Date / Time: 4-18-18 / 1440			
Product Depth (fbTOR): NA			Water Column (ft): 8.15			DTW when sampled: ~~TD~~ 25.15			
DTW (static) (fbTOR): 25.15			One Well Volume (gal) 5.32			Purpose: ☐ Development ☐ Sample ☑ Purge & Sample			
Total Depth (fbTOR): 33.30			Total Volume Purged (gal): 16.5			Method: ~~Dedicated tubing and submersible pump~~ bailer			

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1341	0	Initial	0	11.71	12.8	988.8	4.06	2.14	-180	Clear, No odor
1403	1	25.15	5.4	11.72	12.6	1000	4.44	1.75	-177	
1419	2	25.15	10.8	11.74	12.1	1007	4.25	1.56	-193	
1440	3	25.15	16.2	11.75	11.9	1018	4.25	1.78	-201	
	4									
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
	S1									
1450	S2	25.15	16.5	11.76	11.6	1020	3.33	1.88	-195	

Well No. MWN-25A			Diameter (inches): 2"			Sample Date / Time: 4-18-18 / 1601			
Product Depth (fbTOR): NA			Water Column (ft): 6.78			DTW when sampled: 15.55			
DTW (static) (fbTOR): 15.55			One Well Volume (gal) 1.11			Purpose: ☐ Development ☐ Sample ☑ Purge & Sample			
Total Depth (fbTOR): 22.33			Total Volume Purged (gal): 3.5			Method: ~~Dedicated tubing and submersible pump~~ bailer			

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1537	0	Initial	0	11.62	9.3	614.1	5.21	5.42	-140	Clear, No odor
1545	1	15.55	1.1	9.91	9.5	1007	6.49	2.88	-121	
1554	2	15.55	2.2	9.07	9.8	1078	5.04	2.76	-157	
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1601	S1	15.55	3.3	9.01	9.9	1109	5.15	2.65	-165	
1618	S2	15.55	3.5	9.06	8.9	1055	4.81	3.24	-160	

REMARKS: MWN-25A may have coal dust in well

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: BMG

TURNKEY ENVIRONMENTAL RESTORATION, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: 2018 Benzol Plant ICM sampling

Project No.: 6071-017-910

Client: Tecumseh

Date: 4-18-18

Instrument Source: ☒ BM ☐ Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
☒ pH meter	units	846	Myron L Company Ultra Meter 6P	6213516 ☐ 6243084 ☐ 6212375 ☐ 6243003 ☒ 6223973 ☐	BMB	4.00 7.00 10.01	3.99 7.01 10.01	
☒ Turbidity meter	NTU	839	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) ☐ 13120C030432 (Q) ☐ 17110C062619 (Q) ☒	BMB	10 NTU verification <0.4 20 100 800	10.0 ~~20.0~~ ~~98.5~~ 797	10.0 20.1 99.3 797
☐ Turbidity meter	NTU		LaMotte 2020	6523-1816 (La) ☐		0.0 NTU 1.0 NTU 10.0 NTU		
☒ Sp. Cond. meter	uS mS	842	Myron L Company Ultra Meter 6P	6213516 ☐ 6243084 ☐ 6212375 ☐ 6243003 ☒ 6223973 ☐	BMB	1413 mS @ 25 °C	1413	
☐ PID	ppm		MinRAE 2000			open air zero ____ ppm Iso. Gas		MIBK response factor = 1.0
☒ Dissolved Oxygen	ppm	828	HACH Model HQ30d	080700023281 ☐ 100500041867 ☒ 140200100319 ☐	BMB	100% Satuartion	100%	
☐ Particulate meter	mg/m^3					zero air		
☐ Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: Brock Greene **DATE:** 4-18-18

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name: Benzol Plant ICM

Project No.: 0071-017-910

Client: Tecumseh Redevelopment, Inc.

Location: Former Benzol Plant Tank Storage Area (SWMU P-11)

SAMPLE DESCRIPTION

I.D.: **Influent**

Matrix: ☐ SURFACE WATER ☐ STORM ☐ SEEP ☑ GROUNDWATER

SAMPLE INFORMATION

Date Collected: 4-19-18

Time Collected: 1115

Date Shipped to Lab: 4-19-18

Collected By: BMG

Sample Type: ☐ POINT ☑ GRAB ☐ COMPOSITE

Sample Collection Method: ☐ DIRECT DIP ☐ SS / POLY. DIPPER ☐ PERISTALTIC PUMP ☐ POLY. DISP. BAILER ☐ ISCO SAMPLER ☑ OTHER, SAMPLE PORT

SAMPLING INFORMATION

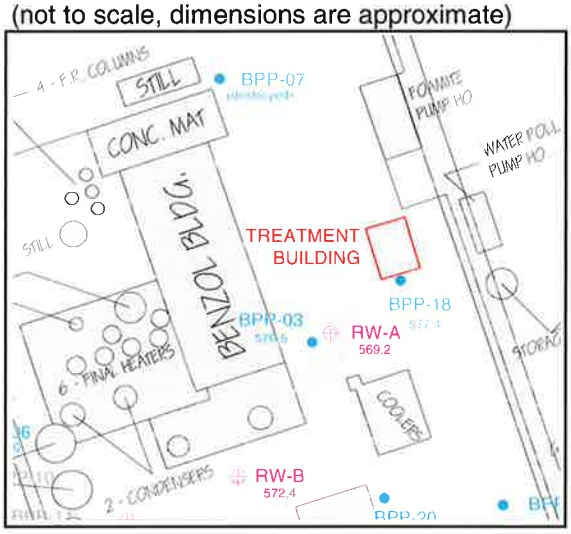
Weather:

Air Temperature:

Parameter	First	Last	Units
pH	--	--	units
Temp.	--	--	°C
Cond.	--	--	mS
Turbidity	--	--	NTU
Eh / ORP	--	--	mV
D.O.	--	--	ppm
Odor	--	--	olfactory
Appearance	--	--	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)
NA	NA	NA

SAMPLE DESCRIPTION (appearance, olfactory): clear, slight odor

SAMPLE ANALYSIS (depth, laboratory analysis required):

Target Compound List (TCL) volatile organic compounds (VOCs) per USEPA Method 8260B

ADDITIONAL REMARKS:

PREPARED BY: BMG **DATE:** 4-19-18

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name: Benzol Plant ICM

Project No.: 0071-017-910

Client: Tecumseh Redevelopment, Inc.

Location: Former Benzol Plant Tank Storage Area (SWMU P-11)

SAMPLE DESCRIPTION

I.D.: **Effluent**

Matrix: ☐ SURFACE WATER ☐ STORM ☐ SEEP ☑ GROUNDWATER

SAMPLE INFORMATION

Date Collected: 4-19-18

Time Collected: 1130

Date Shipped to Lab: 4-19-18

Collected By: BMB

Sample Type: ☐ POINT ☑ GRAB ☐ COMPOSITE

Sample Collection Method: ☐ DIRECT DIP ☐ SS / POLY. DIPPER ☐ PERISTALTIC PUMP ☐ POLY. DISP. BAILER ☐ ISCO SAMPLER ☑ OTHER, SAMPLE PORT

SAMPLING INFORMATION

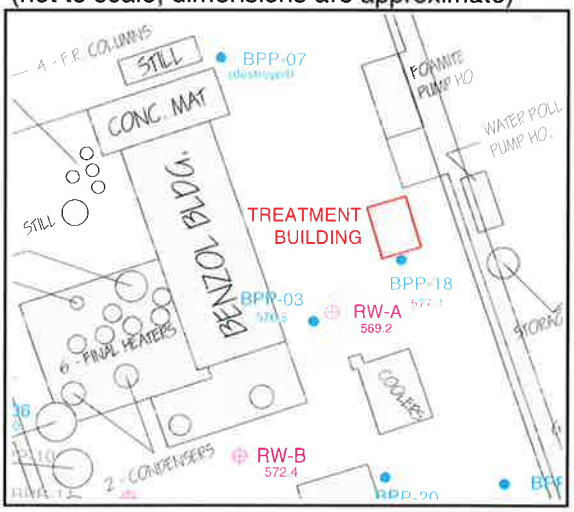
Weather:

Air Temperature:

Parameter	First	Last	Units
pH	--	--	units
Temp.	--	--	°C
Cond.	--	--	mS
Turbidity	--	--	NTU
Eh / ORP	--	--	mV
D.O.	--	--	ppm
Odor	--	--	olfactory
Appearance	--	--	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)
NA	NA	NA

SAMPLE DESCRIPTION (appearance, olfactory):

SAMPLE ANALYSIS (depth, laboratory analysis required):

Target Compound List (TCL) volatile organic compounds (VOCs) per USEPA Method 8260B

ADDITIONAL REMARKS:

PREPARED BY: Brock Greene **DATE:** 4-19-18

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: Bunzol ICM system sampling
Project No.: 007-017-910
Client: Tecumseh

Date: 4-19-18

Instrument Source: ☒ BM ☐ Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
☒ pH meter	units	823	Myron L Company Ultra Meter 6P	6213516 ☐ 6243084 ☐ 6212375 ☐ 6243003 ☒ 6223973 ☐	BMG	4.00 7.00 10.01	3.98 7.00 10.00	
☒ Turbidity meter	NTU	818	Hach 2100P or 2100Q Turbidimeter	06120C020523 (P) ☐ 13120C030432 (Q) ☐ 17110C062619 (Q) ☒	BMG	10 NTU verification <0.4 20 100 800	10.1 20.1 99.8 801	
☐ Turbidity meter	NTU		LaMotte 2020	6523-1816 (La) ☐		0.0 NTU 1.0 NTU 10.0 NTU		
☒ Sp. Cond. meter	uS mS	820	Myron L Company Ultra Meter 6P	6213516 ☐ 6243084 ☐ 6212375 ☐ 6243003 ☒ 6223973 ☐	BMG	1413 mS @ 25 °C	1413	
☐ PID	ppm		MinRAE 2000			open air zero ____ ppm Iso. Gas		MIBK response factor = 1.0
☒ Dissolved Oxygen	ppm	816	HACH Model HQ30d	080700023281 ☐ 100500041867 ☒ 140200100319 ☐	BMG	100% Satuartion	100%	
☐ Particulate meter	mg/m^3					zero air		
☐ Radiation Meter	uR/H					background area		

ADDITIONAL REMARKS:

PREPARED BY: Brock Greene **DATE:** 4-19-18

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 3

SUMMARY OF GROUNDWATER ELEVATIONS

5-11-2018

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Lackawanna, New York

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)
RECOVERY WELLS (12)					
RW-1	583.03	9.49	9.50	0.00	583.03
RW-2	582.97	6.05	6.08	0.00	582.97
RW-3	582.61	—	7.42	0.00	582.61
RW-A	583.26	—	5.57	0.00	583.26
RW-B	584.06	—	14.80	0.00	584.06
RW-C	583.88	—	9.34	0.00	583.88
RW-D	583.76	—	11.24	0.00	583.76
RW-E	583.71	—	7.50	0.00	583.71
RW-F	583.68	7.45	7.61	0.00	583.68
RW-G	583.38	7.60	7.71	0.00	583.38
RW-H	583.11	7.49	7.75	0.00	583.11
RW-I	582.89	—	13.63	0.00	582.89
PIEZOMETERS (22)					
BPP-03	585.18	—	7.55	0.00	585.18
BPP-04	~ D E S T R O Y E D ~				
BPP-05	583.21	—	7.15	0.00	583.21
BPP-06	583.42	8.21	8.73	0.00	583.42
BPP-07	~ D E S T R O Y E D ~				
BPP-08	~ D E S T R O Y E D ~				
BPP-09	~ D E S T R O Y E D ~				
BPP-13	584.69	8.83	9.31	0.00	584.69
BPP-17	584.73	8.18	8.30	0.00	584.73
BPP-18	585.38	—	7.89	0.00	585.38
BPP-19	585.67	—	8.92	0.00	585.67
BPP-20	585.73	—	8.29	0.00	585.73
BPP-21	585.08	—	8.54	0.00	585.08
BPP-22	584.72	—	7.68	0.00	584.72

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 3

SUMMARY OF GROUNDWATER ELEVATIONS

5-11-2018

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Lackawanna, New York

Well Designation [1]	TOR Elevation [2] (fmsl)	Depth to Product (if present) (fbTOR)	Depth To Water (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)
BPP-23	585.27	—	9.63	0.00	585.27
BPP-24	584.47	—	7.34	0.00	584.47
BPP-25	~ DESTROYED ~				
BPP-26	584.29	—	7.26	0.00	584.29
BPP-27	~ DESTROYED ~				
P-18S	~ DESTROYED ~				
P-19S	584.58	—	7.36	0.00	584.58
P-20S	~ DESTROYED ~				
STAFF GAUGES (1)					
SG-01 (canal)	581.90	—	8.51	0.00	581.90
MONITORING WELLS (13)					
MWN-09	584.78	—	11.35	0.00	584.78
MWN-19A	585.15	—	8.03	0.00	585.15
MWN-21A	583.85	—	6.83	0.00	583.85
MWN-27C	583.15	—	6.73	0.00	583.15
MWN-30A	585.43	—	7.41	0.00	585.43
MWN-31A	583.80	—	7.51	0.00	583.80
MWN-32A	587.04	—	10.31	0.00	587.04
MWN-45A	584.43	—	10.18	0.00	584.43
MWN-46A	582.62	—	5.93	0.00	582.62
MWN-47A	582.92	—	11.28	0.00	582.92
MWN-53A	584.19	—	8.85	0.00	584.19
MWN-54A	584.68	—	9.42	0.00	584.68
MWN-55A	584.20	—	7.59	0.00	584.20

ATTACHMENT 3

HISTORICAL GROUNDWATER MONITORING ANALYTICAL RESULTS

MWN-53A

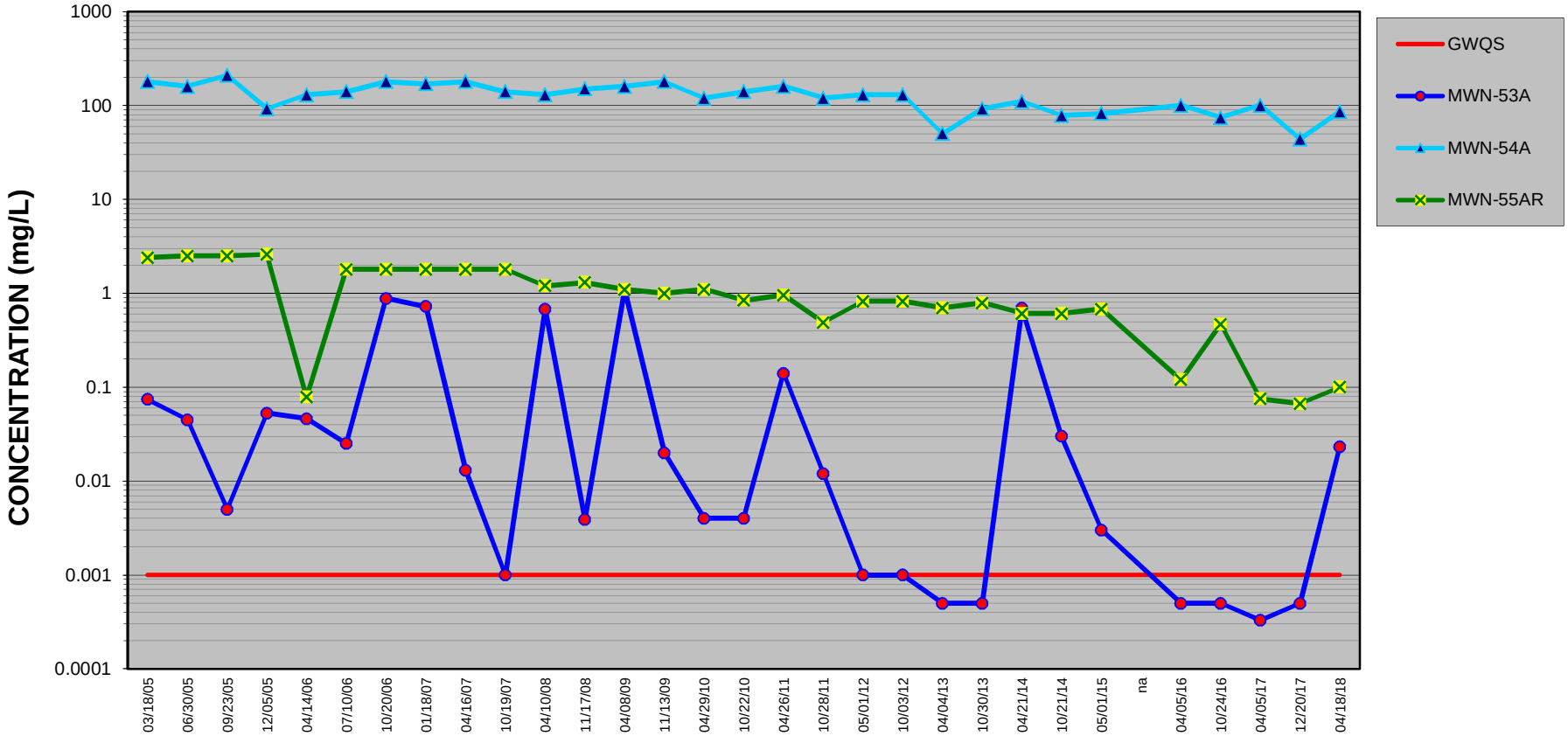
MWN-54A

MWN-55A

FIGURE 3-1

HISTORICAL GROUNDWATER QUALITY TREND IN DOWNGRADIENT WELLS
BENZENE

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.



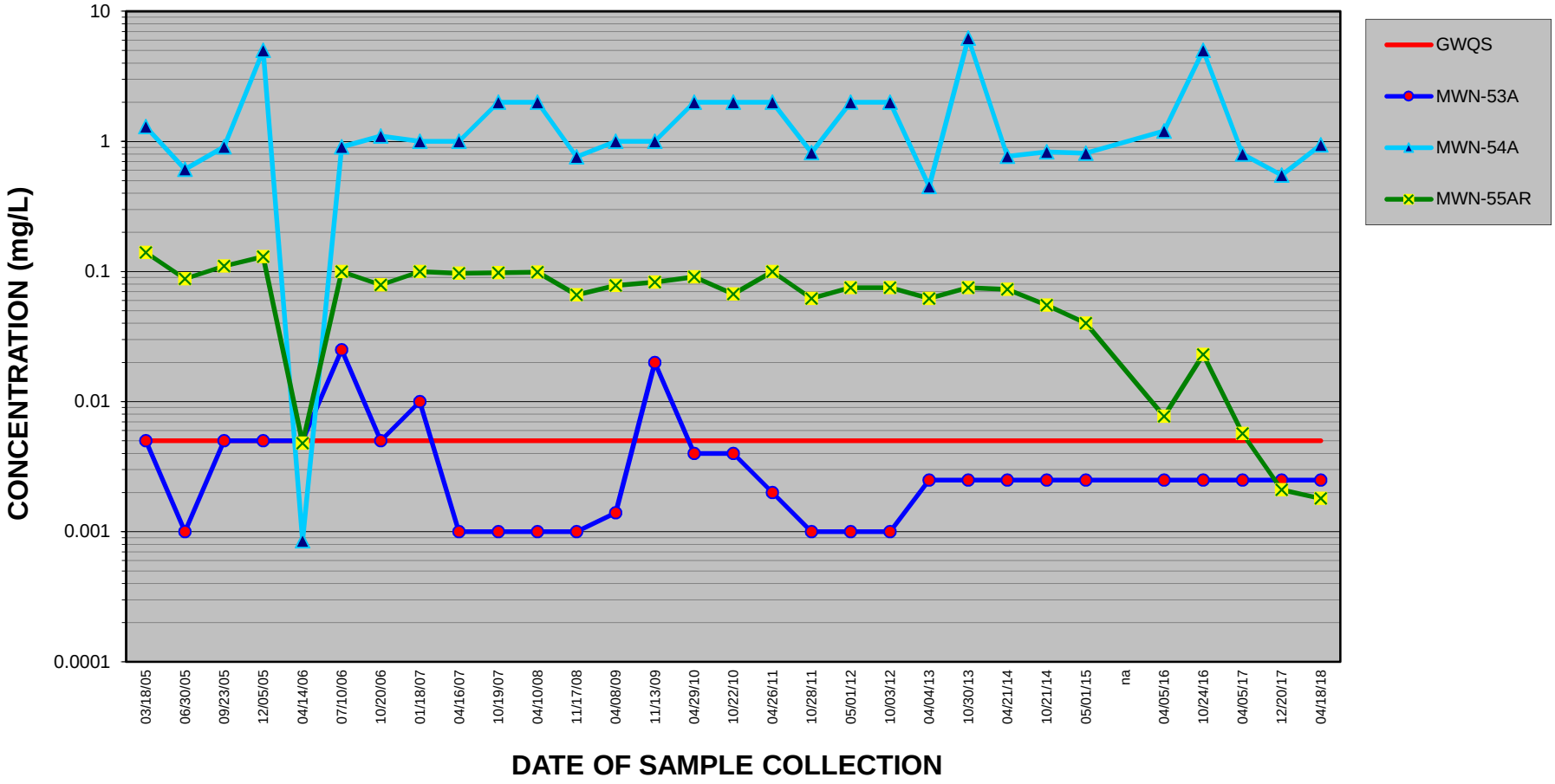
DATE OF SAMPLE COLLECTION

Note:
Sample concentrations reported as non-detect are presented as the reporting limit.
GWQS = Groundwater Quality Standard

FIGURE 3-2

HISTORICAL GROUNDWATER QUALITY TREND IN DOWNGRADIENT WELLS
ETHYLBENZENE

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

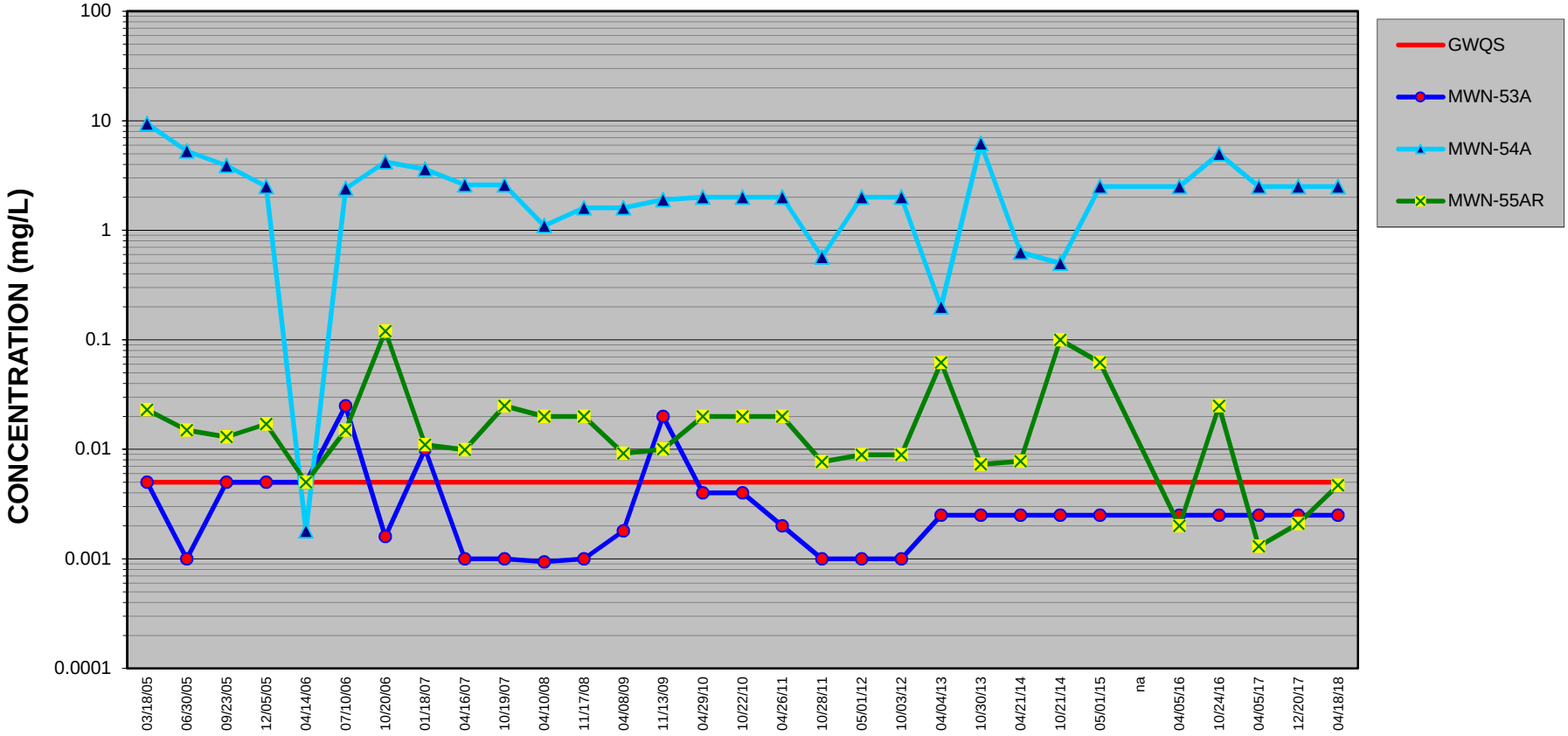


Note:
Sample concentrations reported as non-detect are presented as the reporting limit.
GWQS = Groundwater Quality Standard

FIGURE 3-3

HISTORICAL GROUNDWATER QUALITY TREND IN DOWNGRADIENT WELLS
TOLUENE

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

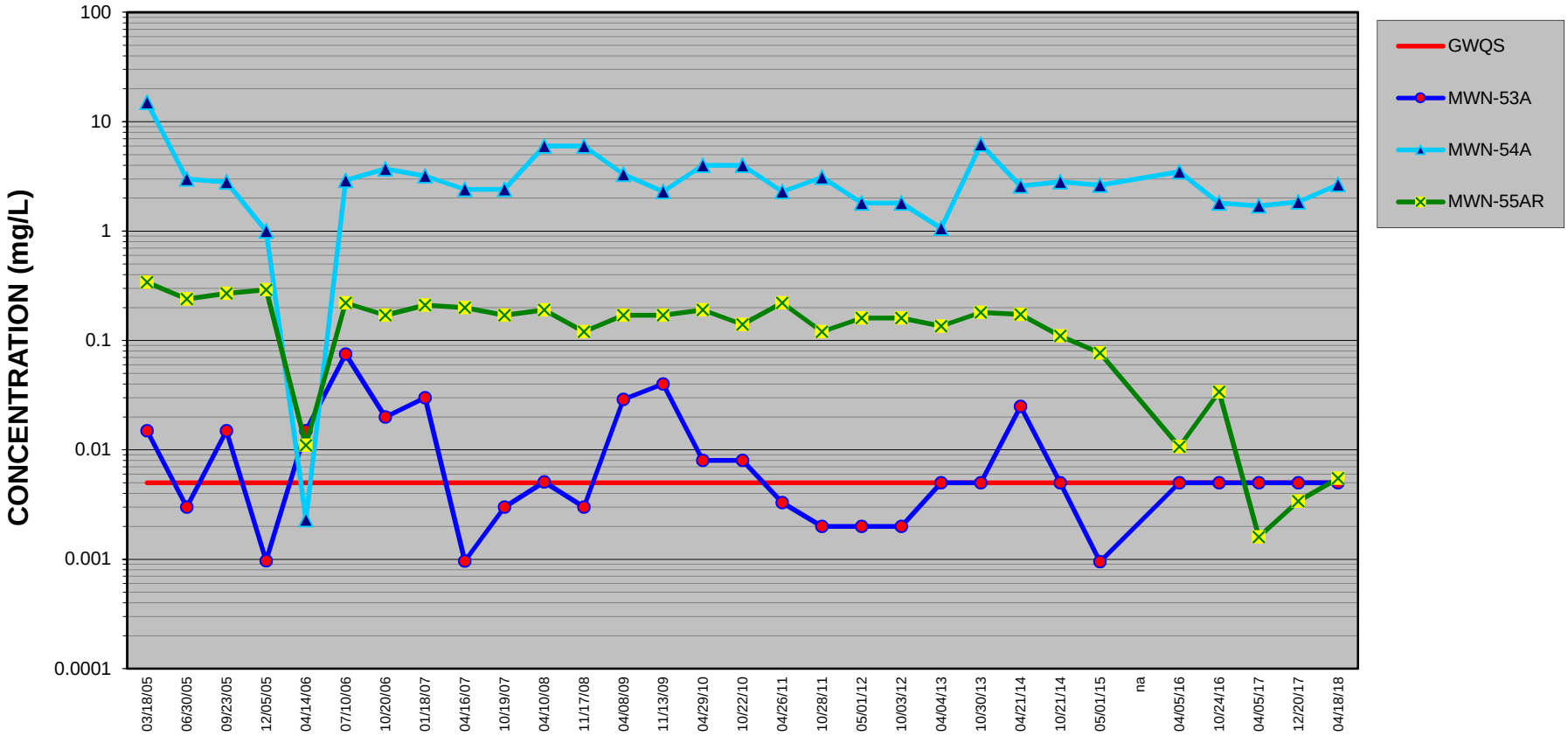


Note:
Sample concentrations reported as non-detect are presented as the reporting limit.
GWQS = Groundwater Quality Standard

FIGURE 3-4

HISTORICAL GROUNDWATER QUALITY TREND IN DOWNGRADIENT WELLS
TOTAL XYLENES

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.



DATE OF SAMPLE COLLECTION

Note:
Sample concentrations reported as non-detect are presented as the reporting limit.
GWQS = Groundwater Quality Standard

ATTACHMENT 4

HISTORICAL INFLUENT/EFFLUENT ANALYTICAL RESULTS

TABLE 4-1

SUMMARY OF HISTORICAL INFLUENT ANALYTICAL RESULTS

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Parameter	Concentration vs. Time Plot [2]	Groundwater Monitoring Event																																		
		2005									2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	2016		2017		2018
		YEAR 1									YEAR 2				YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8		YEAR 9		YEAR 10	YEAR 11		YEAR 12		YEAR 13	
		Start-Up	M1	Y1Q1 / M2	M3	M4	Y1Q2 / M5	M6	Y1Q3	Y1Q4	Y2Q1	Y2Q2	Y2Q3	Y2Q4	Y3SA1	Y3SA2	Y4SA1	Y4SA2	Y5SA1	Y5SA2	Y6SA1	Y6SA2	YYSA1	Y7SA2	Y8SA1	Y8SA2	Y9SA1	Y9SA2	Y10SA1	Y10SA2	Y11SA2	Y12SA1	Y12SA2	Y13SA1	Y13SA2	
		05/04/05	05/31/05	06/30/05	08/04/05	08/29/05	09/23/05	10/31/05	12/05/05	04/14/06	07/10/06	10/30/06	01/18/07	04/16/07	10/19/07	04/10/08	11/17/08	04/08/09	11/13/09	04/29/10	10/22/10	04/26/11	10/28/11	05/01/12	10/03/12	04/04/13	10/30/13	04/21/14	10/14/14	04/30/15	04/05/16	10/24/16	04/05/17	12/20/17	04/19/18	
Volatile Organic Compounds (VOCs) (mg/L):																																				
Acetone		0.05 ND	0.066 J	0.2 ND	2.5 ND	25 ND	25 ND	25 ND	25 ND	50 ND	50 ND	25 ND	5 ND	5 ND	5 ND	5 ND	4 ND	0.007	5 ND	5 ND	10 ND	10 ND	2 ND	10 ND	10 ND	1.2 ND	5 ND	2 ND	2.5 ND	5 ND	5 ND	5 ND	5 ND	5 ND	5 ND	
Benzene	x	91 D	57 D	65 D	69 D	120 D	120 D	120 D	100 D	120	110	63	93	110 D	81	70	40	78 D	100 D	73 D	71 D	55	87	76	49	75 D	48	64	34	67	63	90	94	27	13	
2-Butanone (MEK)		0.25 ND	0.25 ND	0.2 ND	2.5 ND	25 ND	25 ND	25 ND	25 ND	50 ND	50 ND	25 ND	5 ND	5 ND	5 ND	5 ND	4 ND	0.003 J	5 ND	5 ND	10 ND	10 ND	2 ND	10 ND	10 ND	1.2 ND	5 ND	2 ND	2.5 ND	5 ND	5 ND	5 ND	5 ND	5 ND	5 ND	
Carbon Disulfide		0.25 ND	0.25 ND	0.2 ND	2.5 ND	25 ND	25 ND	25 ND	25 ND	50 ND	50 ND	25 ND	5 ND	5 ND	5 ND	5 ND	4 ND	0.001 ND	5 ND	1 ND	1 ND	1 ND	2 ND	1 ND	1 ND	1.2 ND	5 ND	2 ND	2.5 ND	5 ND	5 ND	5 ND	5 ND	5 ND	5 ND	
Chlorobenzene		0.05 ND	0.05 ND	0.04 ND	0.5 ND	5 ND	5 ND	5 ND	5 ND	10 ND	10 ND	5 ND	1 ND	1 ND	1 ND	1 ND	0.8 ND	0.0013	1 ND	1 ND	1 ND	1 ND	2 ND	1 ND	1 ND	0.62 ND	2.5 ND	1 ND	1.2 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	
Cyclohexane		0.05 ND	0.05 ND	0.04 ND	0.5 ND	5 ND	5 ND	5 ND	5 ND	10 ND	10 ND	5 ND	1 ND	1 ND	1 ND	1 ND	0.8 ND	0.0071	1 ND	1 ND	1 ND	1 ND	2 ND	1 ND	1 ND	2.5 ND	10 ND	4 ND	5 ND	10 ND	10 ND	10 ND	10 ND	10 ND	10 ND	
1,2-Dichlorobenzene		0.05 ND	0.05 ND	0.04 ND	0.5 ND	5 ND	5 ND	5 ND	5 ND	10 ND	10 ND	5 ND	0.44 J	1 ND	1 ND	1 ND	0.8 ND	0.001 ND	1 ND	1 ND	1 ND	1 ND	2 ND	1 ND	1 ND	0.62 ND	2.5 ND	1 ND	1.2 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	0.63	2.5 ND	
Ethylbenzene	x	0.42	0.4	0.39	0.4 J	2.9 J	1.1 J	0.81 J	0.79 J	1 J	1.2 J	0.69 J	1.1	0.8 J	0.74 J	1 ND	0.3 J	0.66 DJ	0.79 DJ	1 ND	1 ND	1 ND	1.5	1 ND	1 ND	0.43 J	2.5 ND	0.69 J	1.2 ND	2.5 ND	2.5 ND	0.88 J	2.5 ND	0.88 J	0.14 J	
Isopropylbenzene		0.05 ND	0.05 ND	0.04 ND	0.5 ND	5 ND	5 ND	5 ND	5 ND	10 ND	10 ND	5 ND	1 ND	1 ND	1 ND	1 ND	0.8 ND	0.0067	1 ND	1 ND	1 ND	1 ND	2 ND	1 ND	1 ND	0.62 ND	2.5 ND	1 ND	1.2 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	
Methylcyclohexane		0.05 ND	0.05 ND	0.04 ND	0.5 ND	5 ND	5 ND	5 ND	5 ND	10 ND	10 ND	5 ND	1 ND	1 ND	1 ND	1 ND	0.8 ND	0.0048	1 ND	1 ND	1 ND	1 ND	2 ND	1 ND	1 ND	2.5 ND	10 ND	4 ND	5 ND	10 ND	10 ND	10 ND	10 ND	10 ND	10 ND	
Methylene Chloride		0.05 ND	0.05 ND	0.025 J	0.5 ND	5 ND	5 ND	5 ND	1 J	10 ND	1.8 J	0.66 J	0.88 J	1 ND	1.7	1 ND	0.8 ND	0.001 ND	1 ND	1 ND	1 ND	0.59 J	2 ND	1 ND	1 ND	0.62 ND	2.5 ND	1 ND	1.2 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	2.5 ND	
Toluene	x	10 D	6.1 D	6.3 D	8.7	16	13	12	14	16	15	8.1	14	12	5.5	4.7	1.6	8.5 D	8.6 D	2.9 D	4.7 D	6.1	17	5.7	2.4	6.2	4.7	8.3	3.6	4.1	2.6	8.3	9	1 J	0.33 J	
Xylenes, Total	x	2.7	2.6	3	2.6	23	9.5 J	5.7 J	5.6 J	7.6 J	8.5 J	4.9 J	7.7	5.7	4.5	2.7 J	1.3 J	4.4 D	4.4 D	2.1 D	2.7 D	3.3	11	2.8	1.1 J	2.96	1.67 J	3.8	2.15 J	1.4 J	2.4 J	5.6 J	3.68 J	0.55 J	0.54 J	
Total Influent VOCs	**x**	**104.12**	**66.17**	**74.72**	**80.70**	**161.90**	**143.60**	**138.51**	**121.39**	**144.60**	**136.50**	**77.35**	**117.12**	**128.50**	**93.44**	**77.40**	**43.20**	**91.59**	**113.79**	**78.00**	**78.40**	**64.99**	**116.50**	**84.50**	**52.50**	**84.59**	**54.37**	**76.79**	**39.75**	**72.50**	**68.00**	**104.78**	**106.68**	**30.06**	**14.01**	

Notes:

1. Compounds detected above the method detection limit and exceeding the GWQS for two consecutive events at a minimum of one sample location are plotted versus time.
2. B= Analyte is found in the associated blank, as well as in the sample.
3. D = Compound identified in an analysis at the secondary dilution factor.
4. J = Estimated value
5. M = monthly monitoring event
6. Y#Q# = year and quarter of performance monitoring event
7. Y#SA# = year and semi-annual performance monitoring event

Color Scheme:

= This parameter was not detected above the method detection limit; value represents the method detection limit and is not used to determine Total VOCs.

TABLE 4-2

SUMMARY OF HISTORICAL EFFLUENT ANALYTICAL RESULTS

Former Benzol Plant Tank Storage Area ICM (SWMU P-11)
Tecumseh Redevelopment Inc.

Parameter	Concentration vs. Time Plot [2]	Groundwater Monitoring Event																																		
		2005									2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	2016		2017		2018
		YEAR 1									YEAR 2				YEAR 3		YEAR 4		YEAR 5		YEAR 6		YEAR 7		YEAR 8		YEAR 9		YEAR 10	YEAR 11	YEAR 12		YEAR 13			
		Start-Up	M1	Y1Q1 / M2	M3	M4	Y1Q2 / M5	M6	Y1Q3	Y1Q4	Y2Q1	Y2Q2	Y2Q3	Y2Q4	Y3SA1	Y3SA2	Y4SA1	Y4SA2	Y5SA1	Y5SA2	Y6SA1	Y6SA2	YYSA1	Y7SA2	Y8SA1	Y8SA2	Y9SA1	Y9SA2	Y10SA1	Y10SA2	Y11SA2	Y12SA1	Y12SA2	Y13SA1	Y13SA2		
		05/04/05	05/31/05	06/30/05	08/04/05	08/29/05	09/23/05	10/31/05	12/05/05	04/14/06	07/10/06	10/30/06	01/18/07	04/16/07	10/19/07	04/10/08	11/17/08	04/08/09	11/13/09	04/29/10	10/22/10	04/26/11	10/28/11	05/01/12	10/03/12	04/04/13	10/30/13	04/21/14	10/21/14	04/30/15	04/05/16	10/24/16	04/05/17	12/20/17	04/19/18		
Volatile Organic Compounds (VOCs) (mg/L):																																				
Acetone		0.25 ND	0.25 ND	0.005 ND	0.012	0.012 J	0.011 J	0.018 J	0.1 ND	0.2 ND	0.02 J	0.2 ND	0.04 ND	0.04 ND	0.022 J	0.0059 J	0.0021 J	0.0081	0.016	0.0038 J	0.0043 J	0.0088 J	0.05 ND	0.0044 J	0.0045 J	0.0026 J	0.0064	0.0062	0.0042 J	0.013	0.0045 J	0.0029 J	0.0087	0.0061 J	0.0062	
Benzene	x	0.05 ND	0.013 J	0.0045	0.019	0.1 D	0.018	0.0084	0.2	0.53	0.012 J	0.4	0.072	0.097	0.81 D	0.16	0.025	0.018 B	0.091	0.76 D	0.16 D	0.019	0.025	0.004	0.0027	0.0023	0.0024	0.0016	0.043	0.015	0.013	0.011	0.0096	5E-04 ND	0.016	
2-Butanone (MEK)		0.05 ND	0.25 ND	0.005 ND	0.0035 J	0.009 J	0.025 ND	0.025 ND	0.1 ND	0.2 ND	0.2 ND	0.2 ND	0.04 ND	0.04 ND	0.04 ND	0.002 ND	0.005 ND	0.005 ND	0.0048 J	0.005 ND	0.01 ND	0.003 J	0.05 ND	0.001 ND	0.001 ND	0.0012 J	0.005 ND	0.005 ND	0.005 ND	0.0042 J	0.005 ND	0.005 ND	0.0028 J	0.005 ND	0.005 ND	
Carbon Disulfide		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.00044 J	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	0.005 ND	
Chlorobenzene		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	
Cyclohexane		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.0076	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	
1,2-Dichlorobenzene		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.019	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	
Ethylbenzene	x	0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.077	0.0011 J	0.00047 J	0.0049 J	0.0056 J	0.04 ND	0.0049 J	0.008 ND	0.008 ND	0.014	0.0013 J	0.0004 J	0.00022 J	0.00089 J	0.006	0.0014	0.001 ND	0.0048 J	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.00089 J	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	
Isopropylbenzene		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.026	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	
Methylcyclohexane		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.086	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.01 ND	0.00047 J	0.01 ND	0.00047 J	0.01 ND	0.01 ND	
Methylene Chloride		0.05 ND	0.05 ND	0.00069 J	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.009 J	0.04 ND	0.008 ND	0.0045 J	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	
1,2,4-Trimethylbenzene		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.001 J	0.003 ND	0.003 ND	0.003 ND	
1,2,5-Trimethylbenzene		0.05 ND	0.05 ND	0.001 ND	0.001 ND	0.005 ND	0.005 ND	0.005 ND	0.02 ND	0.04 ND	0.04 ND	0.04 ND	0.008 ND	0.008 ND	0.008 ND	0.002 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.001 ND	0.005 ND	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.003 ND	0.0015 J	0.003 ND	0.003 ND	0.003 ND	
Toluene	x	0.05 ND	0.05 ND	0.00077 J	0.0025	0.04	0.0024 J	0.0013 J	0.031	0.077	0.04 ND	0.055	0.011	0.011	0.11	0.012	0.0013	0.0022	0.0086	0.049	0.01	0.0025	0.0071	0.001 ND	0.001 ND	0.003 ND	0.003 ND	0.003 ND	0.0063	0.0011 J	0.0011 J	0.0011 J	0.0013 J	0.003 ND	0.003 ND	
Xylenes, Total	x	0.15 ND	0.15 ND	0.003 ND	0.0021 J	1.4 D	0.012 J	0.0044 J	0.044 J	0.049 J	0.12 ND	0.042 J	0.012 J	0.024 ND	0.11	0.0088	0.0025 J	0.002 J	0.006	0.041	0.0098	0.0014 J	0.01 ND	0.002 ND	0.002 ND	0.003 ND	0.003 ND	0.003 ND	0.0073 J	0.0011 J	0.001 J	0.00086 J	0.0011 J	0.003 ND	0.00096 J	
Total Effluent VOCs	**x**	**0.00010**	**0.01300**	**0.00796**	**0.03910**	**1.77260**	**0.04450**	**0.03257**	**0.27990**	**0.66160**	**0.04100**	**0.50190**	**0.11400**	**0.12850**	**1.06600**	**0.18800**	**0.03130**	**0.03052**	**0.12773**	**0.85980**	**0.18550**	**0.03470**	**0.03690**	**0.00840**	**0.00720**	**0.00610**	**0.00880**	**0.00780**	**0.06169**	**0.03440**	**0.02007**	**0.01586**	**0.02647**	**0.00610**	**0.02316**	
Percent Reduction	**--**	***100.00%***	***99.98%***	***99.99%***	***99.95%***	***98.91%***	***99.97%***	***99.98%***	***99.77%***	***99.54%***	***99.97%***	***99.35%***	***99.90%***	***99.90%***	***98.86%***	***99.76%***	***99.93%***	***99.97%***	***99.89%***	***98.90%***	***99.76%***	***99.95%***	***99.97%***	***99.99%***	***99.99%***	***99.99%***	***99.98%***	***99.99%***	***99.84%***	***99.95%***	***99.97%***	***99.98%***	***99.98%***	***99.98%***	***99.83%***	

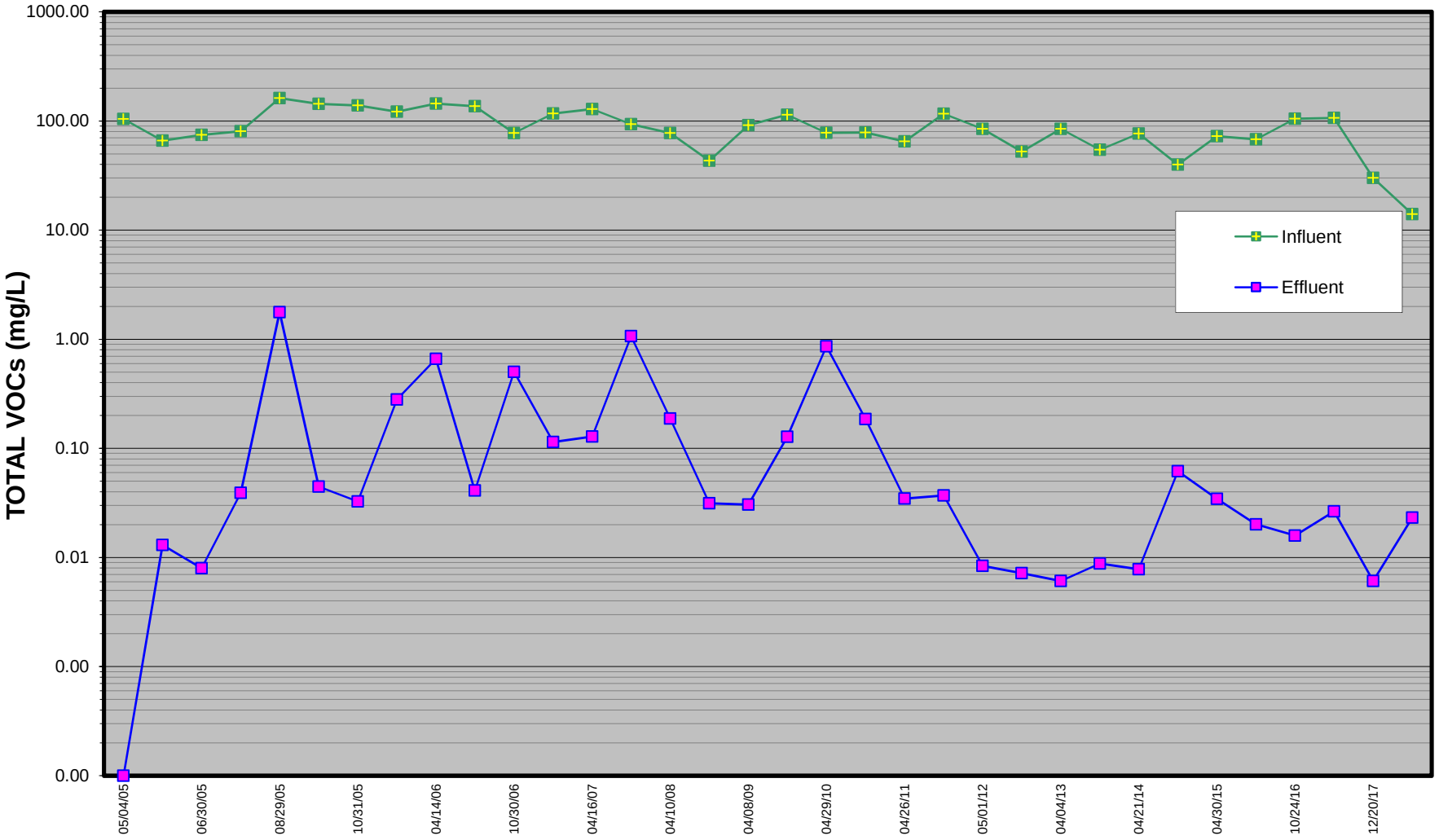
Notes:
1. Compounds detected above the method detection limit and exceeding the GWQS for two consecutive events at a minimum of one sample location are plotted versus time.
2. B= Analyte is found in the associated blank, as well as in the sample.
3. D = Compound identified in an analysis at the secondary dilution factor.
4. J = Estimated value
5. M = monthly monitoring event
6. Y#Q# = year and quarter of performance monitoring event
7. Y#SA# = year and semi-annual performance monitoring event

Color Scheme:
= This parameter was not detected above the method detection limit; value represents the method detection limit and is not used to determine Total VOCs.

FIGURE 4-1

HISTORICAL SUMMARY OF ANALYTICAL RESULTS
TOTAL VOCs

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Interim Corrective Measures

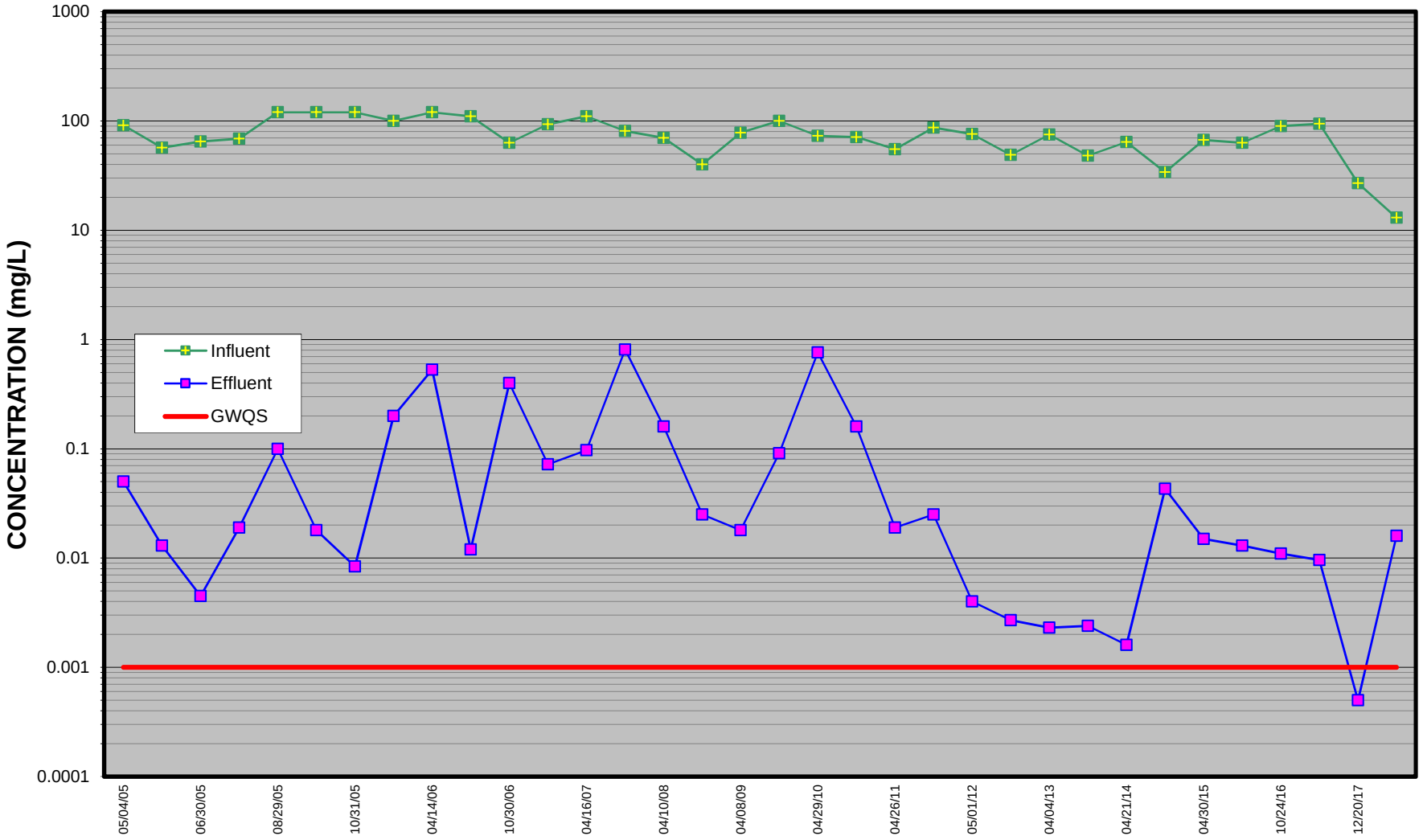


DATE OF MEASUREMENT

FIGURE 4-2

HISTORICAL SUMMARY OF ANALYTICAL RESULTS
BENZENE

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Interim Corrective Measures

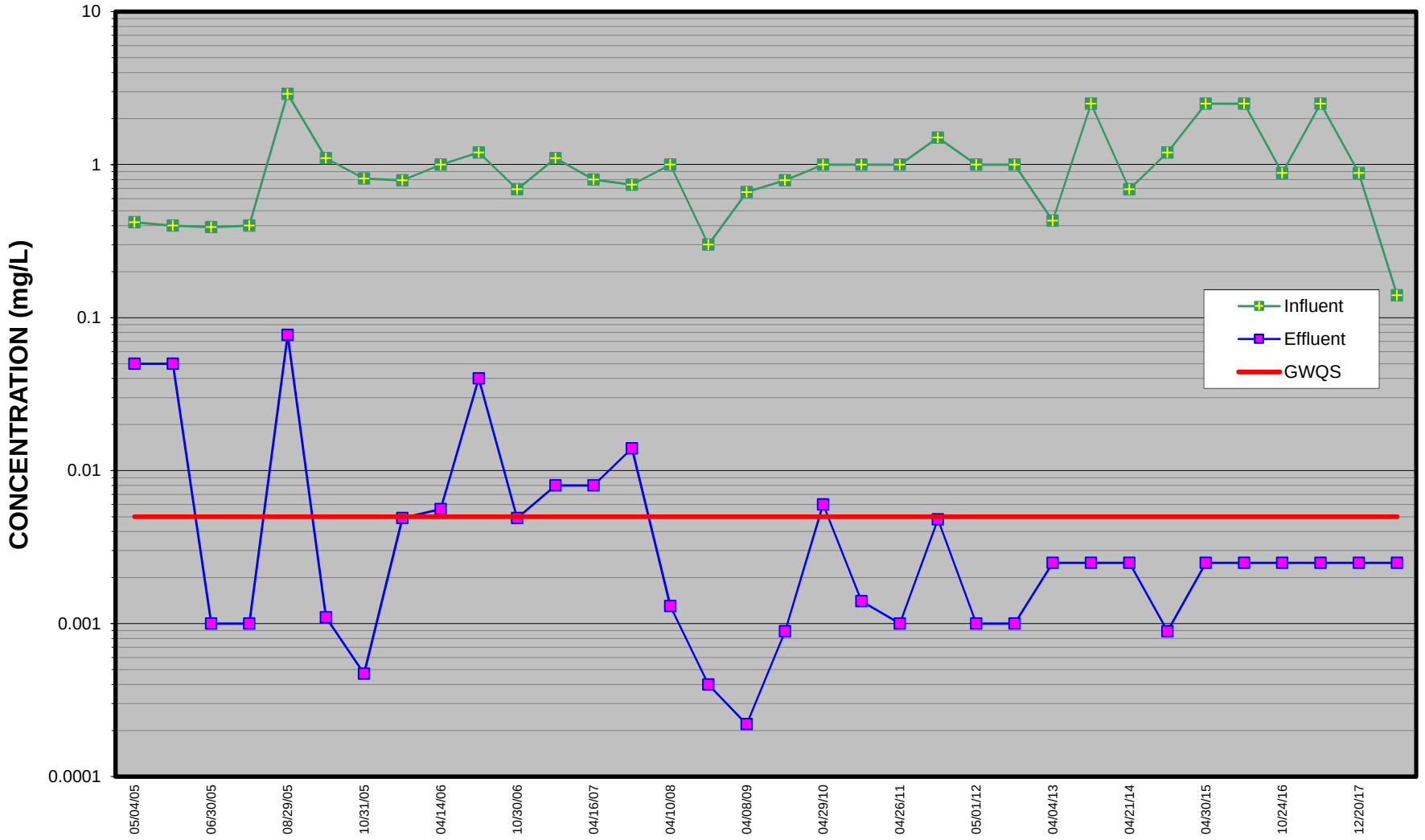


DATE OF MEASUREMENT

FIGURE 4-3

HISTORICAL SUMMARY OF ANALYTICAL RESULTS
ETHYLBENZENE

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Interim Corrective Measures

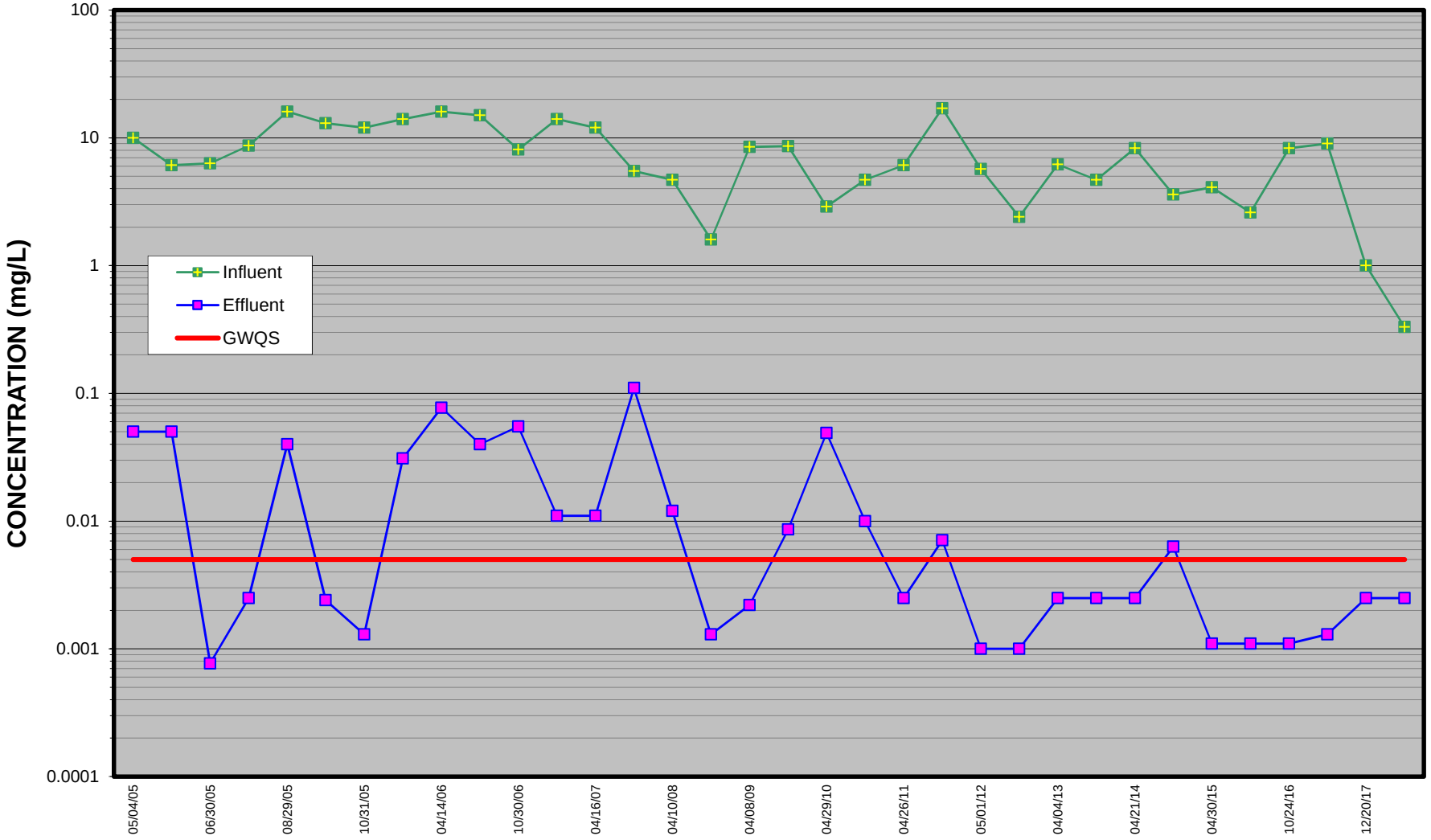


DATE OF MEASUREMENT

FIGURE 4-4

HISTORICAL SUMMARY OF ANALYTICAL RESULTS
TOLUENE

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Interim Corrective Measures

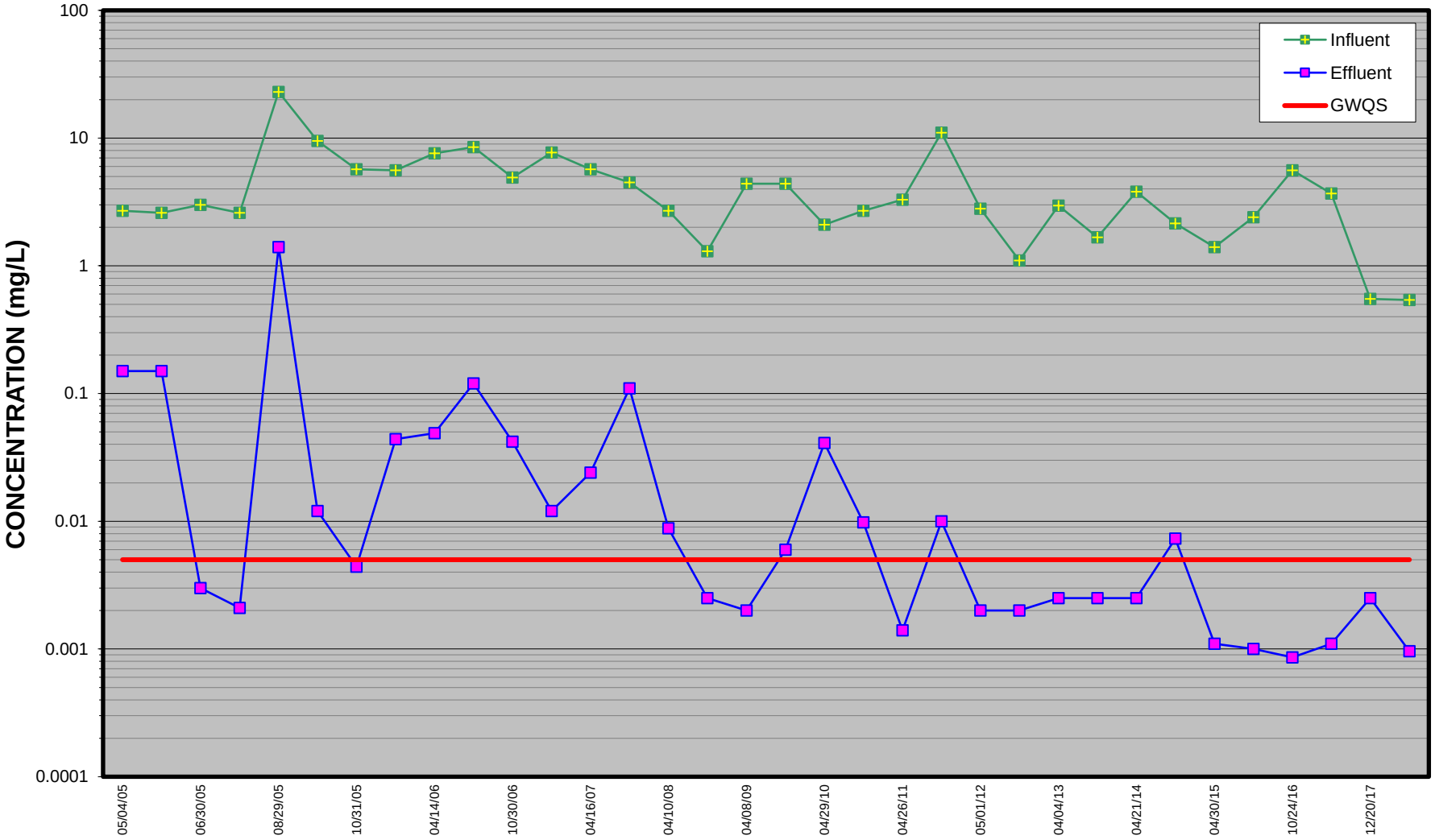


DATE OF MEASUREMENT

FIGURE 4-5

HISTORICAL SUMMARY OF ANALYTICAL RESULTS
TOTAL XYLENES

Former Benzol Plant Tank Storage Area (SWMU P-11)
Tecumseh Redevelopment, Inc.
Interim Corrective Measures



DATE OF MEASUREMENT