



December 5, 2017

**VIA CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

Mr. Scott Buckner  
CITGO Petroleum Corporation  
2316 Terminal Drive  
Arlington Heights, Illinois 60005

**RE: Annual Groundwater Monitoring Report**  
CITGO Milwaukee Terminal  
9235 North 107<sup>th</sup> Street  
Milwaukee, Wisconsin

Dear Mr. Buckner,

Groundwater & Environmental Services, Inc. (GES) has prepared the *Annual Groundwater Monitoring Report* on behalf of CITGO Petroleum Corporation (CITGO) to present the results of the 2017 groundwater sampling event at the above-referenced facility.

Should you have any questions or require additional information, please contact Principal Hydrogeologist, Melissa Blaha at [mblaha@gesonline.com](mailto:mblaha@gesonline.com) or at (866) 455-2419 extension 4038.

**GROUNDWATER & ENVIRONMENTAL SERVICES, INC.**

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

Amber Verbick  
Senior Project Manager

Encl: *Annual Groundwater Monitoring Report*

Cc: Binyoti Amungwafor, Wisconsin Department of Natural Resources, 2300 North Martin Luther King Drive, Milwaukee, Wisconsin 53212



**ANNUAL GROUNDWATER MONITORING REPORT**

CITGO Milwaukee Terminal  
9235 North 107<sup>th</sup> Street  
Milwaukee, Wisconsin

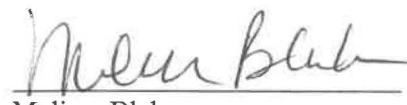
*Prepared for:*

Mr. Scott Buckner  
CITGO Petroleum Corporation  
2316 Terminal Drive  
Arlington Heights, Illinois 60005

*Prepared by:*

**Groundwater & Environmental Services, Inc.**  
1050 Corporate Boulevard, Suite C  
Aurora, Illinois 60505

  
Amber Verbick  
Senior Project Manager

  
Melissa Blaha  
Principal Hydrogeologist

December 5, 2017

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## 1.0 INTRODUCTION

Groundwater & Environmental Services, Inc. (GES), on behalf of CITGO Petroleum Corporation (CITGO), conducted a groundwater sampling event on September 21, 2017 at the CITGO Milwaukee Terminal located at 9235 North 107<sup>th</sup> Street, Milwaukee, Milwaukee County, Wisconsin (site). The Site Location Map, Local Area Map and Site Map are presented as **Figure 1**, **Figure 2** and **Figure 3**, respectively.

## 2.0 MONITORING DATA

On September 21, 2017, GES conducted a groundwater sampling event at the site. Six monitoring wells (MW-101, MW-103, MW-104, MW-105, MW-112, and MW-113) and three piezometers (PZ-101, PZ-113, and PZ-114) were sampled. Each monitoring well and piezometer was gauged to determine the groundwater elevation. The data from the monitoring wells was used to evaluate the groundwater flow direction for the shallow aquifer, and the data from the piezometers was used to determine the groundwater flow direction for the intermediate aquifer. The measured depth of groundwater beneath the site in the monitoring wells is between 2.63-feet and 9.27-feet below top of casing (TOC). The measured depth of groundwater beneath the site in the piezometers is between 1.74-feet and 6.47-feet below TOC. Utilizing these measurements, the groundwater flow for the shallow aquifer beneath the site was evaluated to be in a southeasterly direction as illustrated on **Figure 4**. The groundwater flow for the intermediate aquifer beneath the site was evaluated to be in the easterly direction as illustrated on **Figure 5**. The groundwater elevation measurements have been summarized on **Table 1**.

A minimum of three well volumes were purged from each monitoring well prior to the collection of the groundwater samples. Aqueous samples were placed in laboratory provided glassware, packed on ice in shipping containers and submitted under proper chain of custody to Pace Analytical Services, LLC (Pace), of Green Bay, Wisconsin, for analysis of petroleum volatile organic compounds (PVOCs) utilizing United States Environmental Protection Agency (USEPA) Methods 8260. The groundwater samples included one duplicate sample (DUP) from MW-103. The location of monitoring wells and piezometers and their respective groundwater analytical data are illustrated on **Figure 6**. The historical groundwater analytical data are summarized on **Table 2**. The groundwater analytical laboratory report is provided in **Appendix A**.

## 3.0 GROUNDWATER QUALITY

Groundwater analytical laboratory results from the September 21, 2017 sampling event were compared to the Preventative Action Limit (PAL) and the Enforcement Standard (ES) established in Chapter NR 140.05 of the Wisconsin Administrative Code (WAC). The following is a summary of the groundwater analytical laboratory results:

- The groundwater sample collected from monitoring well MW-103 showed a methyl tertiary-butyl ether (MTBE) concentration of 43.3 µg/L, exceeding the PAL of 12 µg/L, but below the ES of 60 µg/L; benzene, toluene, ethylbenzene, total xylenes and total trimethylbenzenes concentrations were all below their PAL and ES limits. Note the duplicate sample (DUP) from monitoring well MW-103 showed a MTBE concentration of 43.5 µg/L; which also exceeds the PAL;
- The groundwater sample collected from piezometer PZ-101 showed a benzene concentration of 24.5 µg/L, exceeding the PAL of 0.5 µg/L and the ES of 5 µg/L; toluene, ethylbenzene,



total xylenes, MTBE and total trimethylbenzenes concentrations were all below their PAL and ES limits;

- The groundwater sample collected from piezometer PZ-114 showed a MTBE concentration of 47.2 µg/L, exceeding the PAL of 12 µg/L, but below the ES of 60 µg/L; benzene, toluene, ethylbenzene, total xylenes and total trimethylbenzenes were all below their PAL and ES limits; and
- All other monitoring wells (MW-101, MW-104, MW-105, MW-112 and MW-113) and piezometer PZ-113 had concentrations below the laboratory detection limits.

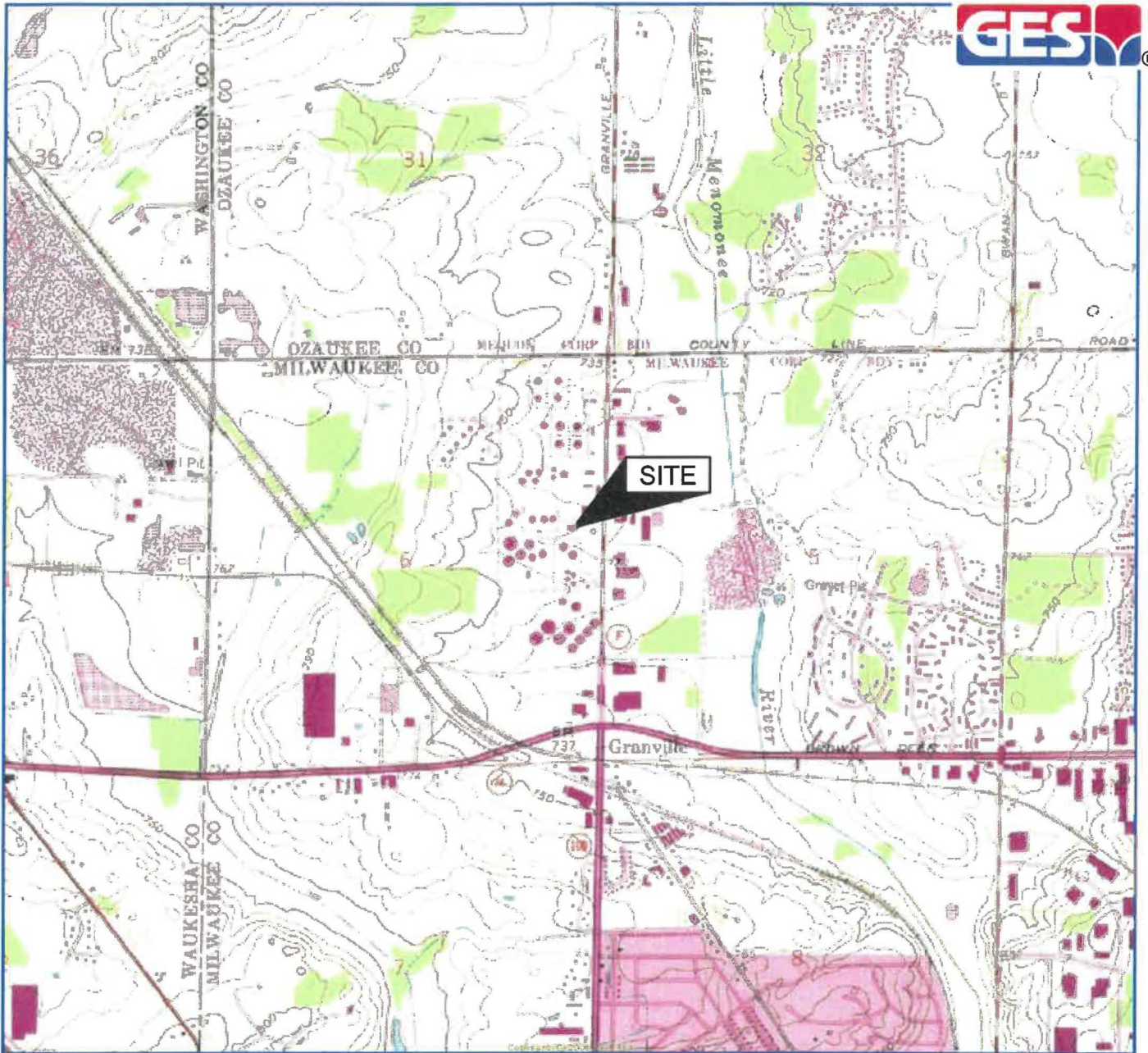
#### **4.0 CONCLUSIONS & RECOMMENDATIONS**

Groundwater analytical results from the September 2017 sampling event generally compared with the September 2016 sampling event showed stable concentrations when compared to historical concentrations. Monitoring well MW-103 had an increase in the MTBE concentration and was similar to the November 2011 sampling event. Piezometer PZ-114 also had an increase in MTBE. No other wells or piezometers had increased concentrations.

Based on the results of the September 2017 groundwater sampling event, GES recommends bi-annual groundwater monitoring at the site.

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**FIGURES**



SOURCE: USGS 7.5 MINUTE SERIES  
 TOPOGRAPHIC QUADRANGLE 1994  
 MENOMONEE FALLS, WISCONSIN  
 CONTOUR INTERVAL = 10'

TOWNSHIP - 8N  
 RANGE - 21E  
 SECTION - 6



QUADRANGLE LOCATION

DRAFTED BY: E.M.E. (N.J.)	<b>SITE LOCATION MAP</b>					
CHECKED BY:				<b>CITGO PETROLEUM CORPORATION MILWAUKEE TERMINAL 9235 N 107th STREET MILWAUKEE, WISCONSIN</b>		
REVIEWED BY:						
NORTH 	<b>Groundwater &amp; Environmental Services, Inc.</b> 1050 CORPORATE BOULEVARD, SUITE C, AURORA, IL 60505					
	SCALE IN FEET 	DATE 12-4-13	FIGURE 1			
	0	2000				





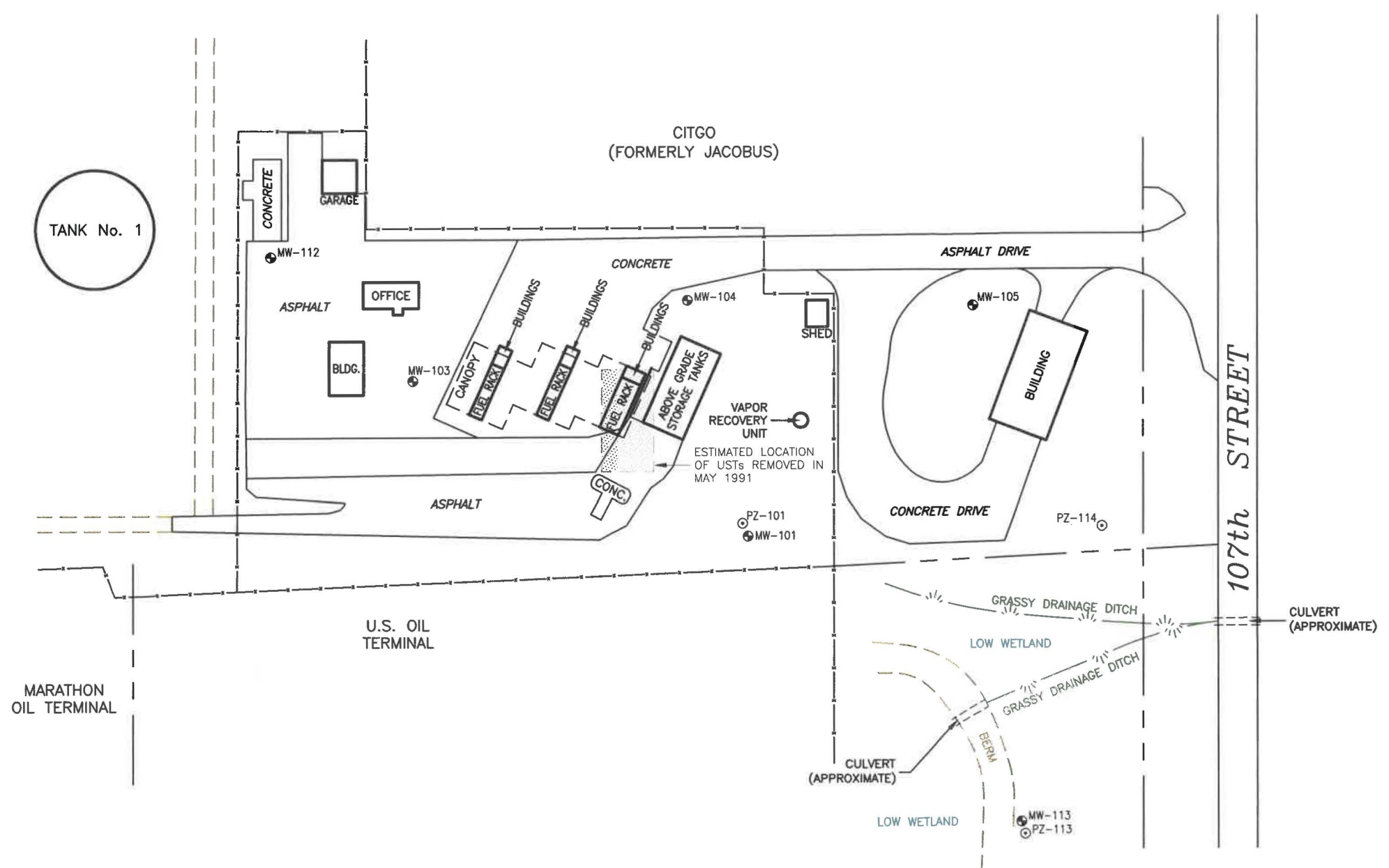
SOURCE: Google Earth Imagery, Imagery Date: July 28, 2011.

DRAFTED BY: E.M.E. (N.J.)	<b>LOCAL AREA MAP</b>		
CHECKED BY:	<b>CITGO PETROLEUM CORPORATION MILWAUKEE TERMINAL 9235 N 107th STREET MILWAUKEE, WISCONSIN</b>		
REVIEWED BY:	<b>Groundwater &amp; Environmental Services, Inc. 1050 CORPORATE BOULEVARD, SUITE C, AURORA, IL 60505</b>		
NORTH 	SCALE IN FEET (APPROXIMATE)	DATE	FIGURE
		12-4-13	2



**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- - - CHAIN LINK FENCE
- ⊕ MONITORING WELL
- ⊙ PIEZOMETER

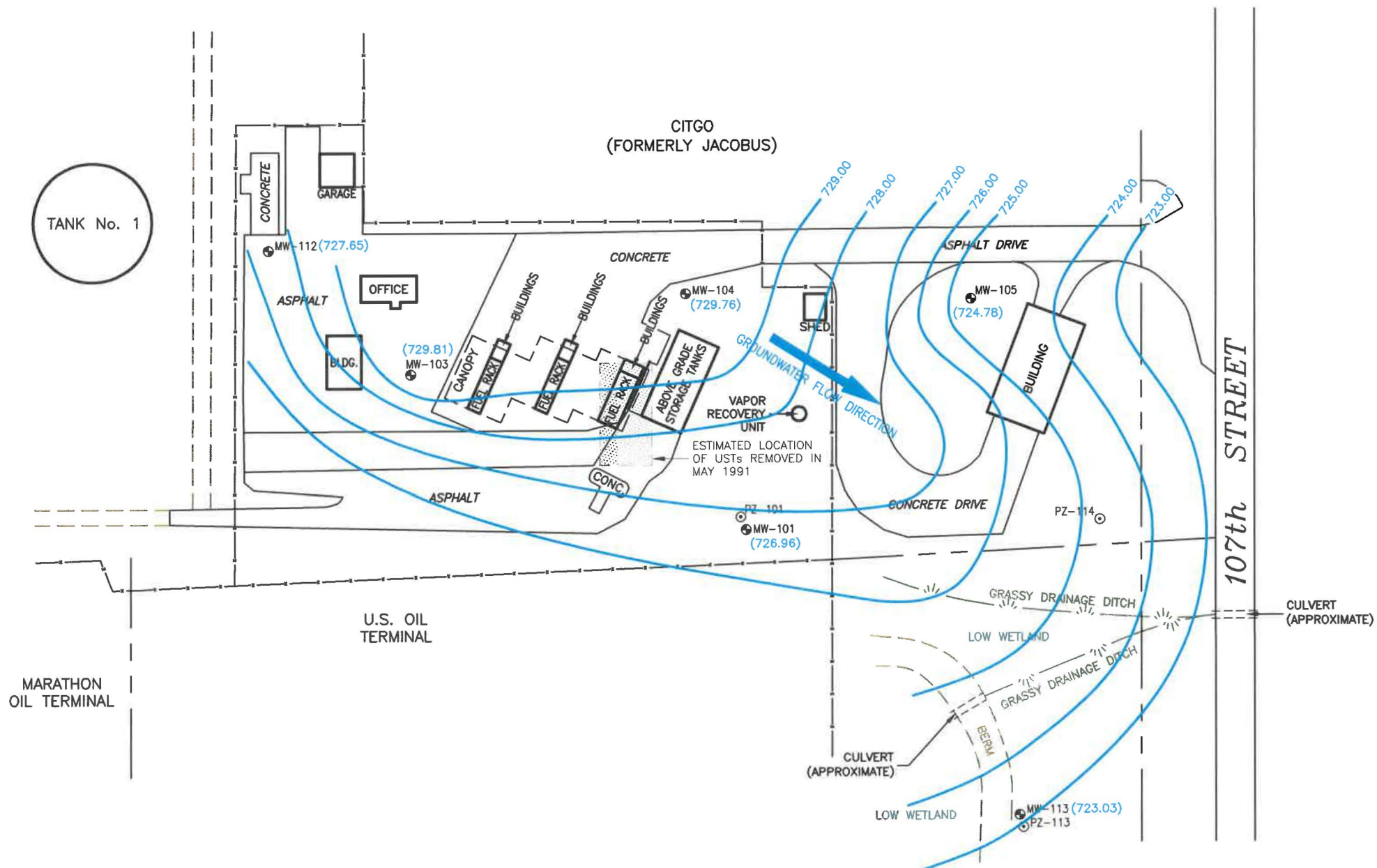


DRAFTED BY: T.P.	<b>SITE MAP</b>		
CHECKED BY:	<b>CITGO PETROLEUM CORPORATION MILWAUKEE TERMINAL 9235 N 107th STREET MILWAUKEE, WISCONSIN</b>		
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1050 CORPORATE BOULEVARD, SUITE C, AURORA, IL 60505		
NORTH 	SCALE IN FEET	DATE	FIGURE
	 0 (APPROXIMATE) 80	11-08-17	3

M:\Graphics\1400-Chicago\Citgo\9235 Milwaukee-WI SM.dwg, B-80, tpeters

**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- - - CHAIN LINK FENCE
- ⊕ MONITORING WELL
- ⊙ PIEZOMETER
- (727.65) GROUNDWATER ELEVATION (feet)
- ~ GROUNDWATER CONTOUR (feet)



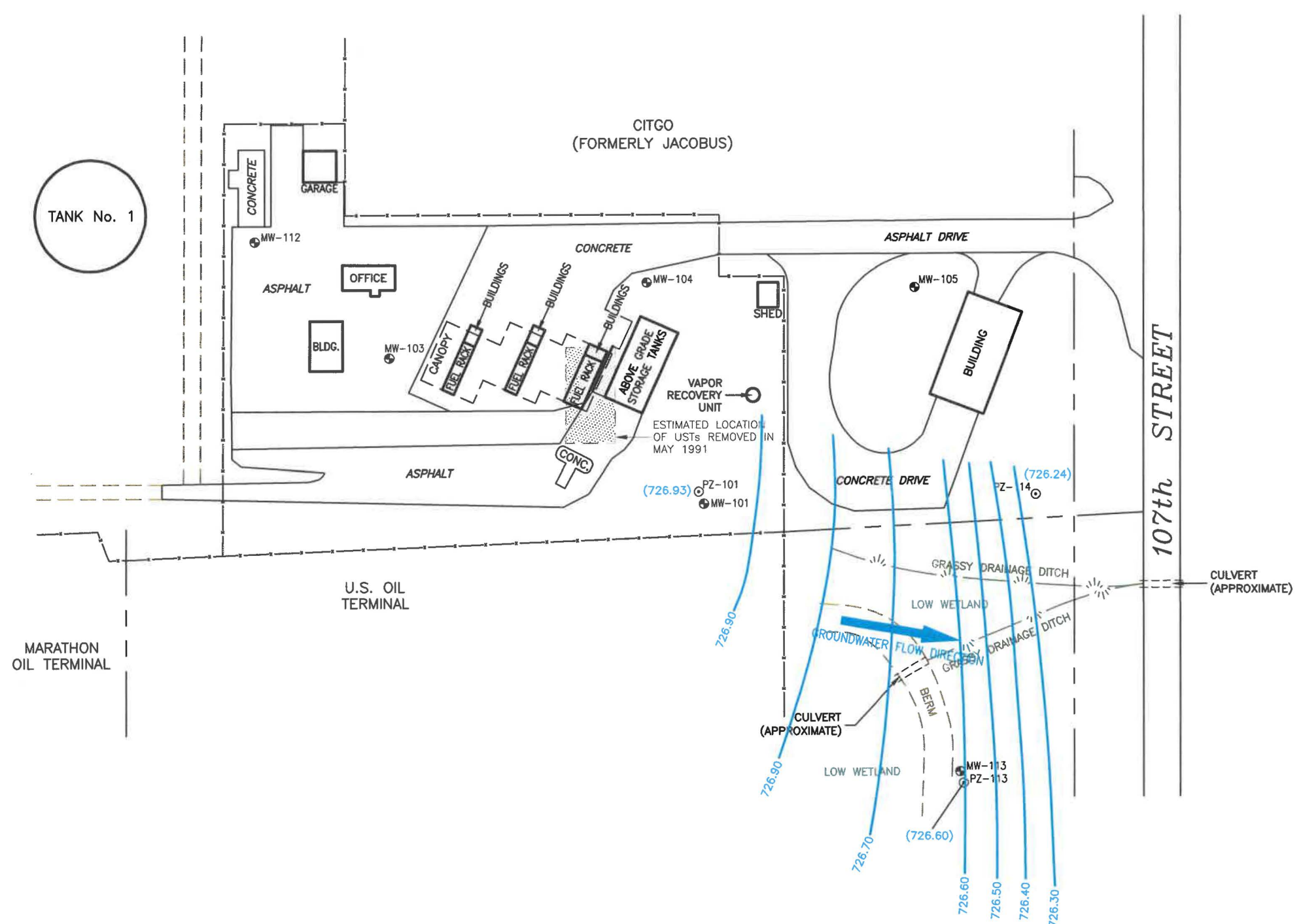
DRAFTED BY: T.P.	<b>SHALLOW GROUNDWATER ELEVATION CONTOUR MAP SEPTEMBER 21, 2017</b>		
CHECKED BY:	<b>CITGO PETROLEUM CORPORATION MILWAUKEE TERMINAL 9235 N 107th STREET MILWAUKEE, WISCONSIN</b>		
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1050 CORPORATE BOULEVARD, SUITE C, AURORA, IL 60505		
NORTH 	SCALE IN FEET	DATE	FIGURE
	 0 (APPROXIMATE) 80	11-08-17	4

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**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- - - CHAIN LINK FENCE
- ⊕ MONITORING WELL
- ⊙ PIEZOMETER
- (726.93) GROUNDWATER ELEVATION (feet)
- ~ GROUNDWATER CONTOUR (feet)



DRAFTED BY: T.P.	<b>PIEZOMETER INTERMEDIATE GROUNDWATER ELEVATION CONTOUR MAP SEPTEMBER 21, 2017</b>	
CHECKED BY:	<b>CITGO PETROLEUM CORPORATION MILWAUKEE TERMINAL 9235 N 107th STREET MILWAUKEE, WISCONSIN</b>	
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1050 CORPORATE BOULEVARD, SUITE C, AURORA, IL 60505	
NORTH 	SCALE IN FEET 	DATE 11-08-17
	0 (APPROXIMATE) 80	FIGURE 5

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MW-112	B	MTBE
8/28/1995	ND	ND
3/2/1998	<1	<1
9/10/1998	<1	<1
6/1/1999	<1	<1
12/8/1999	<0.13	<0.16
5/26/2000	<0.1	<0.25
6/10/2002	<b>3.9</b>	<0.43
11/5/2003	<b>0.58 Q</b>	<0.58
11/29/2004	<0.14	<0.36
10/28/2005	<b>1.8</b>	<0.36
10/19/2006	<0.25	<0.23
11/1/2007	<0.25	<0.23
11/18/2008	<0.25	<0.23
12/4/2009	<0.39	<0.38
11/10/2010	<0.39	<0.38
11/30/2011	<b>2.2</b>	<0.38
11/7/2012	<0.5	<1
11/4/2013	<0.5	<1
11/6/2014	<0.5	<1
9/26/2016	<0.5	<1
9/21/2017	<0.5	<0.17

MW-103	B	MTBE
8/25/1995	ND	<b>140</b>
9/21/1995	ND	<b>80</b>
6/12/1996	ND	<b>46</b>
3/2/1998	<1	<1
9/10/1998	<1	<1
6/1/1999	<1	<b>130</b>
12/8/1999	<0.83	<b>310</b>
5/26/2000	<0.5	<b>380</b>
6/10/2002	<2.2	<b>580</b>
11/5/2003	<1.5	<b>600</b>
11/29/2004	<0.55	<b>550</b>
10/28/2005	<0.14	<b>390</b>
10/19/2006	<1.2	<b>420</b>
11/1/2007	<2.5	<b>400</b>
11/18/2008	<10 RL3	<b>310</b>
12/4/2009	<0.39	<b>289</b>
11/10/2010	<0.39	<b>254</b>
11/30/2011	<0.39	<b>43.8</b>
11/7/2012	<0.5	8.9
11/4/2013	<0.5	13
11/6/2014	<0.5	9.5
9/26/2016	<0.5	19
9/21/2017	<0.5	<b>43.3</b>

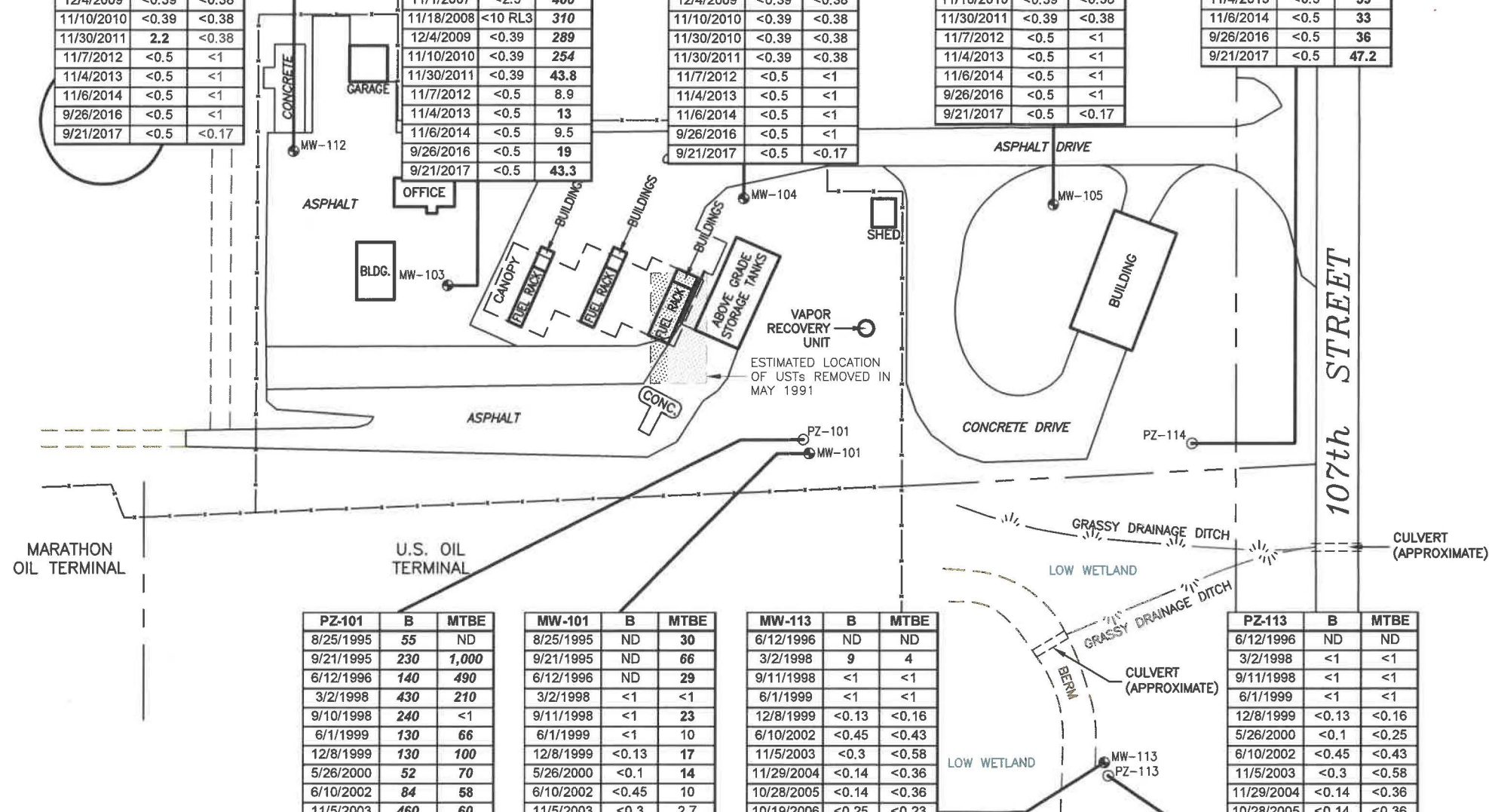
MW-104	B	MTBE
8/25/1995	ND	ND
6/12/1996	ND	ND
3/2/1998	<1	<1
9/11/1998	<1	<1
6/1/1999	<1	<1
12/8/1999	<0.13	0.39
6/10/2002	<0.45	<0.43
11/5/2003	<0.3	<0.58
11/29/2004	<0.14	<0.36
10/28/2005	<0.14	<0.36
10/19/2006	<0.25	<0.23
11/1/2007	<0.25	<0.23
11/18/2008	<25	<0.23
12/4/2009	<0.39	<0.38
11/10/2010	<0.39	<0.38
11/30/2011	<0.39	<0.38
11/7/2012	<0.5	<1
11/4/2013	<0.5	<1
11/6/2014	<0.5	<1
9/26/2016	<0.5	<1
9/21/2017	<0.5	<0.17

MW-105	B	MTBE
8/25/1995	ND	ND
3/2/1998	<1	<1
9/10/1998	<1	<1
6/1/1999	<1	<1
12/8/1999	<0.13	<0.16
6/10/2002	<0.45	<0.43
11/5/2003	<0.3	<0.58
11/29/2004	<0.14	<0.36
10/28/2005	<0.14	<0.36
10/19/2006	<0.25	<0.23
11/1/2007	<0.25	<0.23
11/18/2008	<0.25	<0.23
12/4/2009	<0.39	<0.38
11/10/2010	<0.39	<0.38
11/30/2011	<0.39	<0.38
11/7/2012	<0.5	<1
11/4/2013	<0.5	<1
11/6/2014	<0.5	<1
9/26/2016	<0.5	<1
9/21/2017	<0.5	<0.17

PZ-114	B	MTBE
4/14/2000	<0.5	<b>46</b>
5/26/2000	<0.1	<b>16</b>
6/10/2002	<0.45	<b>25</b>
11/5/2003	<0.3	<b>41</b>
11/29/2004	<0.14	<b>45</b>
10/28/2005	<0.14	<b>52</b>
10/19/2006	<0.25	<b>34</b>
11/1/2007	<0.25	<b>33</b>
11/18/2008	<0.25	<b>31</b>
12/4/2009	<0.39	<b>54.8</b>
11/10/2010	<0.39	<b>52</b>
11/30/2011	<0.39	<b>40.2</b>
11/7/2012	<0.5	<b>48</b>
11/4/2013	<0.5	<b>39</b>
11/6/2014	<0.5	<b>33</b>
9/26/2016	<0.5	<b>36</b>
9/21/2017	<0.5	<b>47.2</b>

**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- x-x- CHAIN LINK FENCE
- ⊕ MONITORING WELL
- ⊙ PIEZOMETER
- B BENZENE CONCENTRATION (µg/L)
- MTBE METHYL *tert*-BUTYL ETHER
- µg/L MICROGRAMS PER LITER
- J ESTIMATED CONCENTRATION
- Q ANALYTE DETECTED BETWEEN THE LIMIT OF DETECTION AND THE LIMIT OF QUANTITATION
- ND or < NOT DETECTED ABOVE THE LABORATORY METHOD DETECTION LIMIT
- Bold** EXCEED NR 140 PREVENTIVE ACTION LIMIT
- Bold/Italics** EXCEED NR 140 ENFORCEMENT STANDARD



PZ-101	B	MTBE
8/25/1995	<b>55</b>	ND
9/21/1995	<b>230</b>	<b>1,000</b>
6/12/1996	<b>140</b>	<b>490</b>
3/2/1998	<b>430</b>	<b>210</b>
9/10/1998	<b>240</b>	<1
6/1/1999	<b>130</b>	<b>66</b>
12/8/1999	<b>130</b>	<b>100</b>
5/26/2000	<b>52</b>	<b>70</b>
6/10/2002	<b>84</b>	<b>58</b>
11/5/2003	<b>460</b>	<b>60</b>
11/29/2004	<b>330</b>	<b>57</b>
10/28/2005	<b>260</b>	<b>92</b>
10/19/2006	<b>140</b>	<b>54</b>
11/1/2007	0.29 J	3.8
11/18/2008	1.1	3.4
12/4/2009	<b>101</b>	<b>15.3</b>
11/10/2010	<b>67</b>	10
11/30/2011	<b>30.7</b>	10.2
11/7/2012	<b>5.5</b>	6.6
11/4/2013	<b>21</b>	8.1
11/6/2014	<b>25</b>	8.6
9/26/2016	<b>41</b>	6.1
9/21/2017	<b>24.5</b>	6.3

MW-101	B	MTBE
8/25/1995	ND	<b>30</b>
9/21/1995	ND	<b>66</b>
6/12/1996	ND	<b>29</b>
3/2/1998	<1	<1
9/11/1998	<1	<b>23</b>
6/1/1999	<1	10
12/8/1999	<0.13	<b>17</b>
5/26/2000	<0.1	<b>14</b>
6/10/2002	<0.45	10
11/5/2003	<0.3	2.7
11/29/2004	<0.14	<b>16</b>
10/28/2005	<0.14	0.41 Q
10/19/2006	<0.25	0.39
11/1/2007	<0.25	0.33 J
11/18/2008	<0.25	0.37 J
12/4/2009	<0.39	<0.38
11/10/2010	<0.39	<0.38
11/30/2011	<0.39	<0.38
11/7/2012	<0.5	<1
11/4/2013	<0.5	<1
11/6/2014	<0.5	<1
9/26/2016	<0.5	<1
9/21/2017	<0.5	0.21 J

MW-113	B	MTBE
6/12/1996	ND	ND
3/2/1998	<b>9</b>	<b>4</b>
9/11/1998	<1	<1
6/1/1999	<1	<1
12/8/1999	<0.13	<0.16
6/10/2002	<0.45	<0.43
11/5/2003	<0.3	<0.58
11/29/2004	<0.14	<0.36
10/28/2005	<0.14	<0.36
10/19/2006	<0.25	<0.23
11/1/2007	<0.25	<0.23
11/18/2008	<0.25	<0.23
12/4/2009	<0.39	<0.38
11/9/2010	<0.39	<0.38
11/29/2011	<0.39	<0.38
11/7/2012	<0.5	<1
11/4/2013	<0.5	<1
11/6/2014	<0.5	<1
9/26/2016	<0.5	<1
9/21/2017	<0.5	<0.17

PZ-113	B	MTBE
6/12/1996	ND	ND
3/2/1998	<1	<1
9/11/1998	<1	<1
6/1/1999	<1	<1
12/8/1999	<0.13	<0.16
5/26/2000	<0.1	<0.25
6/10/2002	<0.45	<0.43
11/5/2003	<0.3	<0.58
11/29/2004	<0.14	<0.36
10/28/2005	<0.14	<0.36
10/19/2006	<0.25	<0.23
11/1/2007	<0.25	<0.23
11/18/2008	<0.25	<0.23
12/4/2009	<0.39	<0.38
11/9/2010	<0.39	<0.38
11/30/2011	<0.39	<0.38
11/7/2012	<0.5	<1
11/4/2013	<0.5	<1
11/6/2014	<0.5	<1
9/26/2016	<0.5	<1
9/21/2017	<0.5	<0.17

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SOURCE: AEROSTAR ENVIRONMENT SERVICES, INC. DEC. 2009.

DRAFTED BY: E.V.	<b>GROUNDWATER CONCENTRATION MAP SEPTEMBER 21, 2017</b>	
CHECKED BY:	<b>CITGO PETROLEUM CORPORATION MILWAUKEE TERMINAL 9235 N 107th STREET MILWAUKEE, WISCONSIN</b>	
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1050 CORPORATE BOULEVARD, SUITE C, AURORA, IL 60505	
NORTH 	SCALE IN FEET 0 (APPROXIMATE) 80	DATE 11-28-17
		FIGURE 6



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**TABLES**

Table 1

**GROUNDWATER ELEVATION DATA**

CITGO - Milwaukee Terminal  
 9235 N 107th Street  
 Milwaukee, Wisconsin

Well ID	Top of Casing (NGVD)	Sample Date	Depth to Water (feet)	Groundwater Elevation
MW-101	733.23	8/25/1995	14.47	718.76
		10/16/1995	5.68	727.55
		6/12/1996	4.56	728.67
		1/2/1998	6.70	726.53
		3/2/1998	3.91	729.32
		9/10/1998	6.49	726.74
		6/1/1999	5.30	727.93
		12/8/1999	6.83	726.40
		5/26/2000	5.20	728.03
		7/26/2000	5.72	727.51
		6/10/2002	4.67	728.56
		11/5/2003	5.35	727.88
		11/29/2004	6.19	727.04
		10/28/2005	6.52	726.71
		10/19/2006	5.33	727.90
		11/1/2007	5.64	727.59
		11/18/2008	6.53	726.70
		12/4/2009	5.93	727.30
		11/9/2010	6.65	726.58
		11/30/2011	5.75	727.48
11/7/2012	6.46	726.77		
11/4/2013	6.27	726.96		
11/6/2014	5.97	727.26		
9/26/2016	5.30	727.93		
9/21/2017	6.27	726.96		
MW-102	731.14	8/25/1995	2.63	728.51
		10/16/1995	2.59	728.55
		6/13/1996	1.49	729.65
		1/2/1998	3.30	727.84
		3/2/1998	1.15	729.99
		9/10/1998	5.10	726.04
		6/1/1999	3.28	727.86
		12/8/1999	3.68	727.46
		5/26/2000	3.38	727.76
		7/26/2000	3.58	727.56
		6/10/2002	2.77	728.37
		11/5/2003	Buried in gravel drive	
		11/29/2004	Well abandoned July 30, 2004	

Table 1

**GROUNDWATER ELEVATION DATA**

CITGO - Milwaukee Terminal  
 9235 N 107th Street  
 Milwaukee, Wisconsin

Well ID	Top of Casing (NGVD)	Sample Date	Depth to Water (feet)	Groundwater Elevation
MW-103	732.44	8/25/1995	2.49	729.95
		10/16/1995	2.50	729.94
		6/12/1996	1.16	731.28
		1/2/1998	4.80	727.64
		3/2/1998	1.18	731.26
		9/10/1998	2.92	729.52
		6/1/1999	1.85	730.59
		12/8/1999	3.54	728.90
		5/26/2000	2.00	730.44
		7/26/2000	2.41	730.03
		6/10/2002	2.27	730.17
		11/5/2003	3.25	729.19
		11/29/2004	2.30	730.14
		10/28/2005	3.36	729.08
		10/19/2006	2.00	730.44
		11/1/2007	2.16	730.28
		11/18/2008	2.69	729.75
		12/4/2009	1.67	730.77
		11/9/2010	3.51	728.93
		11/30/2011	1.85	730.59
11/7/2012	2.61	729.83		
11/4/2013	2.64	729.80		
11/6/2014	2.57	729.87		
9/26/2016	1.79	730.65		
9/21/2017	2.63	729.81		
MW-104	735.06	8/25/1995	10.57	724.49
		10/16/1995	4.92	730.14
		6/12/1996	3.82	731.24
		1/2/1998	5.62	729.44
		3/2/1998	4.08	730.98
		9/10/1998	5.38	729.68
		6/1/1999	4.75	730.31
		12/8/1999	5.09	729.97
		5/26/2000	4.36	730.70
		7/26/2000	5.08	729.98
		6/10/2002	4.19	730.87
		11/5/2003	4.36	730.70
		11/29/2004	4.72	730.34
		10/28/2005	5.16	729.90
		10/19/2006	4.16	730.90
		11/1/2007	4.97	730.09
		11/18/2008	5.02	730.04
		12/4/2009	4.62	730.44
		11/9/2010	5.28	729.78
		11/30/2011	4.55	730.51
11/7/2012	5.13	729.93		
11/4/2013	4.58	730.48		
11/6/2014	4.62	730.44		
9/26/2016	3.90	731.16		
9/21/2017	5.30	729.76		

Table 1

**GROUNDWATER ELEVATION DATA**

CITGO - Milwaukee Terminal  
 9235 N 107th Street  
 Milwaukee, Wisconsin

Well ID	Top of Casing (NGVD)	Sample Date	Depth to Water (feet)	Groundwater Elevation
MW-105	729.88	8/25/1995	10.11	719.77
		10/16/1995	2.90	726.98
		1/2/1998	5.79	724.09
		3/2/1998	3.19	726.69
		9/10/1998	4.80	725.08
		6/1/1999	3.28	726.60
		12/8/1999	4.23	725.65
		5/26/2000	2.61	727.27
		7/26/2000	4.41	725.47
		6/10/2002	3.59	726.29
		11/5/2003	2.95	726.93
		11/29/2004	3.59	726.29
		10/28/2005	4.36	725.52
		10/19/2006	2.00	727.88
		11/1/2007	4.56	725.32
		11/18/2008	4.51	725.37
		12/4/2009	3.56	726.32
		11/9/2010	4.66	725.22
		11/30/2011	3.04	726.84
		11/7/2012	3.63	726.25
11/4/2013	3.53	726.35		
11/6/2014	4.53	725.35		
9/26/2016	3.68	726.20		
9/21/2017	5.10	724.78		
MW-112	732.62	8/28/1995	3.64	728.98
		10/16/1995	3.58	729.04
		1/2/1998	4.90	727.72
		3/2/1998	2.32	730.30
		9/10/1998	6.80	725.82
		6/1/1999	3.32	729.30
		12/8/1999	5.68	726.94
		5/26/2000	4.34	728.28
		7/26/2000	4.12	728.50
		6/10/2002	2.49	730.13
		11/5/2003	3.28	729.34
		11/29/2004	4.60	728.02
		10/28/2005	6.46	726.16
		10/19/2006	3.18	729.44
		11/1/2007	4.32	728.30
		11/18/2008	5.20	727.42
		12/4/2009	3.74	728.88
		11/9/2010	5.86	726.76
		11/30/2011	3.20	729.42
		11/7/2012	5.14	727.48
11/4/2013	4.63	727.99		
11/6/2014	4.33	728.29		
9/26/2016	2.70	729.92		
9/21/2017	4.97	727.65		

Table 1

**GROUNDWATER ELEVATION DATA**

CITGO - Milwaukee Terminal  
 9235 N 107th Street  
 Milwaukee, Wisconsin

Well ID	Top of Casing (NGVD)	Sample Date	Depth to Water (feet)	Groundwater Elevation
MW-113	732.30	6/12/1996	6.36	725.94
		11/9/2010	3.51	728.79
		1/2/1998	6.06	726.24
		3/2/1998	6.19	726.11
		9/10/1998	6.96	725.34
		6/1/1999	6.21	726.09
		12/8/1999	6.97	725.33
		5/26/2000	6.60	725.70
		7/26/2000	7.80	724.50
		6/10/2002	6.50	725.80
		11/5/2003	5.55	726.75
		11/29/2004	7.00	725.30
		10/28/2005	9.21	723.09
		10/19/2006	5.55	726.75
		11/1/2007	7.64	724.66
		11/18/2008	7.04	725.26
		12/4/2009	5.58	726.72
		11/9/2010	7.72	724.58
		11/30/2011	5.99	726.31
		PZ-101	733.40	11/7/2012
11/4/2013	6.35			725.90
11/6/2014	6.76			725.54
9/26/2016	6.28			726.02
9/21/2017	9.27			723.03
8/25/1995	5.38			728.02
10/16/1995	5.32			728.08
6/12/1996	3.82			729.58
1/2/1998	6.36			727.04
3/2/1998	3.85			729.55
9/10/1998	7.33			726.07
6/1/1999	4.65			728.75
12/8/1999	7.20			726.20
5/26/2000	4.40			729.00
7/26/2000	5.65			727.75
6/10/2002	4.01			729.39
11/5/2003	5.23			728.17
11/29/2004	6.69			726.71
10/28/2005	7.96			725.44
10/19/2006	4.78			728.62
11/1/2007	5.53	727.87		
11/18/2008	6.92	726.48		
12/4/2009	5.08	728.32		
11/9/2010	7.19	726.21		
11/30/2011	4.81	728.59		
11/7/2012	6.62	726.78		
11/4/2013	6.38	727.02		
11/6/2014	5.62	727.78		
9/26/2016	4.73	728.67		
9/21/2017	6.47	726.93		

Table 1

**GROUNDWATER ELEVATION DATA**

CITGO - Milwaukee Terminal  
 9235 N 107th Street  
 Milwaukee, Wisconsin

Well ID	Top of Casing (NGVD)	Sample Date	Depth to Water (feet)	Groundwater Elevation	
PZ-102	731.21	8/25/1995	2.90	728.31	
		10/16/1995	2.72	728.49	
		6/13/1996	4.51	726.70	
		12/4/2009	3.56	727.65	
		3/2/1998	1.36	729.85	
		9/10/1998	4.85	726.36	
		6/1/1999	2.22	728.99	
		12/8/1999	4.82	726.39	
		5/26/2000	2.86	728.35	
		7/26/2000	2.64	728.57	
		6/10/2002	1.67	729.54	
		11/5/2003	Buried in gravel drive		
		11/29/2004	Well abandoned July 30, 2004		
PZ-113	732.54	6/12/1996	3.31	729.23	
		1/2/1998	5.89	726.65	
		3/2/1998	3.36	729.18	
		9/10/1998	6.82	725.72	
		6/1/1999	4.10	728.44	
		12/8/1999	6.69	725.85	
		5/26/2000	3.96	728.58	
		7/26/2000	5.13	727.41	
		6/10/2002	3.46	729.08	
		11/5/2003	5.02	727.52	
		11/29/2004	6.18	726.36	
		10/28/2005	7.35	725.19	
		10/19/2006	4.38	728.16	
		11/1/2007	5.19	727.35	
		11/18/2008	6.26	726.28	
		12/4/2009	4.60	727.94	
		11/9/2010	6.61	725.93	
		11/30/2011	4.51	728.03	
		11/7/2012	6.17	726.37	
		11/4/2013	5.88	726.66	
11/6/2014	5.26	727.28			
9/26/2016	4.24	728.30			
9/21/2017	5.97	726.57			

Table 1

**GROUNDWATER ELEVATION DATA**

CITGO - Milwaukee Terminal  
 9235 N 107th Street  
 Milwaukee, Wisconsin

Well ID	Top of Casing (NGVD)	Sample Date	Depth to Water (feet)	Groundwater Elevation
PZ-114	727.98	5/26/2000	0.00	727.98
		7/26/2000	0.08	727.90
		6/10/2002	0.00	727.98
		11/5/2003	0.62	727.36
		11/29/2004	1.66	726.32
		10/28/2005	2.90	725.08
		10/19/2006	0.24	727.74
		11/1/2007	0.84	727.14
		11/18/2008	1.87	726.11
		12/4/2009	0.35	727.63
		11/9/2010	2.26	725.72
		11/30/2011	0.00	727.98
		11/7/2012	1.70	726.28
		11/4/2013	1.52	726.46
		11/6/2014	0.79	727.19
		9/26/2016	0.00	727.98
9/21/2017	1.74	726.24		

NOTES:

1. NGVD = National Geodetic Vertical Datum

Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCS

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCs			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
MW-101		8/25/1995	ND	ND	ND	ND	30	---
		9/21/1995	ND	ND	ND	ND	66	---
		6/12/1996	ND	ND	ND	ND	29	ND
		3/2/1998	<1	<1	<1	<1	<1	<2
		9/11/1998	<1	<1	<1	<1	23	<2
		6/1/1999	<1	<1	<1	<1	10	<2
		12/8/1999	<0.13	<0.2	<0.22	<0.23	17	<0.51
		5/26/2000	<0.1	<0.1	<0.25	<0.25	14	<0.2
		6/10/2002	<0.45	<0.68	<0.82	<1.7	10	<0.94
		11/5/2003	<0.3	<0.58	<0.6	<1.2	2.7	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	16	<0.4
		10/28/2005	<0.14	<0.36	<0.4	<0.74	0.41 Q	<0.4
		10/19/2006	<0.25	<0.11	<0.22	<0.39	0.39	<0.25
		11/1/2007	<0.25	0.14 J	<0.22	<0.39	0.33 J	<0.25
		11/18/2008	<0.25	<0.25	<0.22	<0.39	0.37 J	<0.25
		12/4/2009	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/10/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/30/2011	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	<1	<1
		11/4/2013	<0.5	<0.5	<0.5	<1	<1	<1
	11/6/2014	<0.5	<0.5	<0.5	<1	<1	<1	
	9/26/2016	<0.5	<0.5	<0.5	<1	<1	<1	
	9/21/2017	<0.5	<0.5	<0.5	<1.5	0.21 J	<1	
MW-102		8/25/1995	ND	ND	ND	ND	130	---
		9/21/1995	ND	ND	ND	ND	94	---
		6/13/1996	ND	ND	ND	ND	35	ND
		3/2/1998	3	<1	4	2	<1	2
		9/10/1998	<1	<1	<1	<1	<1	<2
		6/1/1999	<1	<1	<1	<1	36	<2
		12/8/1999	<0.13	<0.2	<0.22	<0.23	54	<0.51
		5/26/2000	<0.1	<0.1	<0.25	<0.25	26	<0.2
		6/10/2002	<0.45	<0.68	<0.82	<1.7	57	<0.94
		11/5/2003	Well buried under street bond					
		11/29/2004	Well abandoned in July 2004 during parking lot pavement					



Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCS

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCS			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
MW-103	DUP	8/25/1995	ND	ND	ND	ND	140	---
		8/25/1995	ND	ND	ND	ND	ND	---
		9/21/1995	ND	ND	ND	ND	80	---
		6/12/1996	ND	ND	ND	ND	46	ND
		3/2/1998	<1	<1	<1	<1	<1	<2
		9/10/1998	<1	<1	<1	<1	<1	<2
	DUP	6/1/1999	<1	<1	<1	<1	130	<2
		6/1/1999	<1	<1	<1	<1	220	<2
		12/8/1999	<0.83	<0.2	<0.22	<0.23	310	<0.51
		5/26/2000	<0.5	<0.5	<1.2	<1.2	380	<0.51
		6/10/2002	<2.2	<3.4	<4.1	<8.5	580	<4.7
		6/10/2002	<2.2	<3.4	<4.1	<8.5	570	<4.7
	DUP	11/5/2003	<1.5	<2.9	<3	<6	600	<3.3
		11/5/2003	<1.5	<2.9	<3	<6	600	<3.3
		11/29/2004	<0.55	<1.4	<1.6	<3	550	<1.6
		11/29/2004	<0.55	<1.4	<1.6	<3	550	<1.6
		10/28/2005	<0.14	<0.36	<0.4	<0.74	390	<0.4
		10/19/2006	<1.2	<0.55	<1.1	<2	420	<1.2
	DUP	10/19/2006	<1.2	<0.55	<1.1	<2	420	<1.2
		11/1/2007	<2.5	<1.1	<2.2	<3.9	400	<2.5
		11/18/2008	<10 RL3	<1	<0.88	<1.6	310	<1
		12/4/2009	<0.39	<0.42	<0.41	<1.25	289	<0.83
		12/4/2009	<0.39	<0.42	<0.41	<1.25	286	<0.83
		11/10/2010	<0.39	<0.42	<0.41	<1.25	254	<0.83
	DUP	11/30/2011	<0.39	<0.42	<0.41	<1.25	43.8	<0.83
		11/30/2011	<0.39	<0.42	<41	<1.25	43.7	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	8.9	<1
		11/7/2012	<0.5	<0.5	<0.5	<1	8.7	<1
		11/4/2013	<0.5	<0.5	<0.5	<1	13	<1
		11/4/2013	<0.5	<0.5	<0.5	<1	16	<1
DUP	11/6/2014	<0.5	<0.5	<0.5	<1	9.5	<1	
	11/6/2014	<0.5	<0.5	<0.5	<1	9.3	<1	
	9/26/2016	<0.5	<0.5	<0.5	<1	19	<1	
	9/26/2016	<0.5	<0.5	<0.5	<1	12	<1	
	9/21/2017	<0.5	<0.5	<0.5	<1.5	43.3	<1	
	9/21/2017	<0.5	<0.5	<0.5	<1.5	43.5	<1	

Table 2

**GROUNDWATER ANALYTICAL DATA - PVOCS**

CITGO Milwaukee Terminal  
 9235 N 107th St  
 Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCS			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
MW-104	DUP	8/25/1995	ND	ND	ND	ND	ND	---
		6/12/1996	ND	ND	ND	ND	ND	ND
		3/2/1998	<1	<1	<1	<1	<1	<2
		9/11/1998	<1	<1	<1	<1	<1	<2
		6/1/1999	<1	<1	<1	<1	<1	<2
		12/8/1999	<0.13	<0.2	<0.22	<0.23	0.39	<0.51
		6/10/2002	<0.45	<0.68	<0.82	<1.7	<0.43	<0.94
		11/5/2003	<0.3	<0.58	<0.6	<1.2	<0.58	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/28/2005	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
	10/28/2005	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4	
	10/19/2006	<0.25	0.13	<0.22	<0.39	<0.23	<0.25	
	11/1/2007	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25	
	11/18/2008	<25	<0.25	<0.22	<0.39	<0.23	<0.25	
	12/4/2009	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83	
	11/10/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83	
	11/10/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83	
	11/30/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83	
	11/30/2011	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83	
	11/7/2012	<0.5	<0.5	<0.5	<1	<1	<1	
11/4/2013	<0.5	<0.5	<0.5	<1	<1	<1		
11/6/2014	<0.5	<0.5	<0.5	<1	<1	<1		
9/26/2016	<0.5	<0.5	<0.5	<1	<1	<1		
9/21/2017	<0.5	<0.5	<0.5	<1.5	<0.17	<1		

Table 2

**GROUNDWATER ANALYTICAL DATA - PVOCS**

CITGO Milwaukee Terminal  
 9235 N 107th St  
 Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCS			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
MW-105		8/25/1995	ND	ND	ND	ND	ND	---
		3/2/1998	<1	<1	<1	<1	<1	<1
		9/10/1998	<1	<1	<1	<1	<1	<1
		6/1/1999	<1	<1	<1	<1	<1	<1
		12/8/1999	<0.13	<0.2	<0.22	<0.23	<0.16	<0.51
		6/10/2002	<0.45	<0.68	<0.82	<1.7	<0.43	<0.94
		11/5/2003	<0.3	<0.58	<0.6	<1.2	<0.58	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/28/2005	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/19/2006	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25
		11/1/2007	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25
		11/18/2008	<0.25	<0.25	<0.22	<0.39	<0.23	<0.25
		12/4/2009	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/10/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/30/2011	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	<1	<1
	11/4/2013	<0.5	<0.5	<0.5	<1	<1	<1	
	11/6/2014	<0.5	<0.5	<0.5	<1	<1	<1	
	9/26/2016	<0.5	<0.5	<0.5	<1	<1	<1	
	9/21/2017	<0.5	1.8	<0.5	<1.5	<0.17	<1	

Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCS

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCs			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
MW-112	DUP  DUP	8/28/1995	ND	ND	ND	ND	ND	---
		3/2/1998	<1	<1	<1	<1	<1	<1
		3/2/1998	<1	<1	<1	<1	<1	<1
		9/10/1998	<1	<1	<1	<1	<1	<1
		9/10/1998	<1	<1	<1	<1	<1	<1
		6/1/1999	<1	<1	<1	<1	<1	<1
		12/8/1999	<0.13	<0.2	<0.22	<0.23	<0.16	<0.51
		5/26/2000	<0.1	<0.1	<0.25	<0.25	<0.25	<0.2
		6/10/2002	3.9	<0.68	<0.82	<1.7	<0.43	<0.94
		11/5/2003	0.58 Q	<0.58	<0.6	<1.2	<0.58	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/28/2005	1.8	<0.36	<0.4	<0.74	<0.36	<0.4
		10/19/2006	<0.25	0.24	<0.22	<0.39	<0.23	<0.25
		11/1/2007	<0.25	0.24 J	<0.22	<0.39	<0.23	<0.25
		11/18/2008	<0.25	0.25	<0.22	<0.39	<0.23	<0.25
		12/4/2009	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/10/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/30/2011	2.2	<0.42	<0.41	<1.25	<0.38	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	<1	<1
11/4/2013	<0.5	<0.5	<0.5	<1	<1	<1		
11/6/2014	<0.5	<0.5	<0.5	<1	<1	<1		
9/26/2016	<0.5	<0.5	<0.5	<1	<1	<1		
9/21/2017	<0.5	<0.5	<0.5	<1.5	<0.17	<1		

Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCS

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCS			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
MW-113		6/12/1996	ND	ND	2	10	ND	4
		3/2/1998	9	<1	<1	<1	4	<2
		9/11/1998	<1	<1	<1	<1	<1	<2
		6/1/1999	<1	<1	<1	<1	<1	<2
		12/8/1999	<0.13	3.5	<0.22	<0.23	<0.16	0.3
		6/10/2002	<0.45	<0.68	<0.82	<1.7	<0.43	<0.94
		11/5/2003	<0.3	<0.58	<0.6	<1.2	<0.58	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/28/2005	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/19/2006	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25
		11/1/2007	<0.25	1.2	<0.22	<0.39	<0.23	<0.25
		11/18/2008	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25
		12/4/2009	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/9/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/29/2011	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	<1	<1
	11/4/2013	<0.5	<0.5	<0.5	<1	<1	<1	
	11/6/2014	<0.5	<0.5	<0.5	<1	<1	<1	
	9/26/2016	<0.5	<0.5	<0.5	<1	<1	<1	
	9/21/2017	<0.5	<0.5	<0.5	<1.5	<0.17	<1	

Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCS

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCs			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)	
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480	
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96	
Sample Location	Sample Type	Sample Date							
PZ-101	DUP	8/25/1995	55	ND	ND	ND	ND	---	
		9/21/1995	230	ND	ND	ND	1,000	---	
		6/12/1996	140	ND	ND	ND	490	ND	
		6/12/1996	140	ND	ND	4	490	4	
		3/2/1998	430	1	26	9	210	7	
		9/10/1998	240	<1	23	<1	<1	7	
		6/1/1999	130	<1	8	<1	66	2	
		12/8/1999	130	1	11	1.3	100	2.8	
		5/26/2000	52	0.58	4.8	<0.5	70	1	
		6/10/2002	84	0.73	24	<1.7	58	<0.94	
		11/5/2003	460	2.2	2.8	<1.2	60	<0.66	
		11/29/2004	330	0.98	1.5	0.93	57	<0.4	
		10/28/2005	260	1.5	2.1	1.5 Q	92	0.41	
		10/19/2006	140	0.87	<0.22	1.3	54	0.37	
		11/1/2007	0.29 J	0.42	<0.22	<0.39	3.8	<0.25	
		11/18/2008	1.1	<0.25	<0.22	<0.39	3.4	<0.25	
		12/4/2009	101	0.92 J	<0.41	<1.26 J	15.3	<0.83	
		11/10/2010	67	0.78 J	<0.41	1.2 J	10	<0.83	
		11/30/2011	30.7	0.47 J	<0.41	<1.25	10.2	<0.83	
		11/7/2012	5.5	<0.5	<0.5	<1	6.6	<1	
11/4/2013	21	<0.5	<0.5	<1	8.1	<1			
11/6/2014	25	<0.5	<0.5	<1	8.6	<1			
9/26/2016	41	0.51	<0.5	<1	6.1	<1			
9/21/2017	24.5	<0.5	<0.5	<1.5	6.3	<1			
PZ-102		8/28/1995	ND	ND	ND	ND	ND	---	
		6/13/1996	ND	ND	ND	ND	ND	ND	
		3/2/1998	10	2	2	4	<1	2	
		9/10/1998	<1	<1	<1	<1	<1	<2	
		6/1/1999	<1	<1	<1	<1	<1	<2	
		12/8/1999	<0.13	<0.2	<0.22	<0.23	<0.16	<0.51	
		5/26/2000	<0.1	<0.1	<0.25	<0.25	0.49	<0.2	
		6/10/2002	<0.45	<0.68	<0.82	<1.7	<0.43	<0.94	
		11/5/2003	Well buried under street bond						
		11/29/2004	Well abandoned in July 2004 during parking lot pavement						

Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCs

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCs			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
PZ-113		6/12/1996	ND	ND	ND	ND	ND	ND
		3/2/1998	<1	<1	<1	<1	<1	<2
		9/11/1998	<1	<1	<1	<1	<1	<2
		6/1/1999	<1	<1	<1	<1	<1	<2
		12/8/1999	<0.13	<0.2	<0.22	<0.23	<0.16	<0.51
		5/26/2000	<0.1	<0.1	<0.25	<0.25	<0.25	<0.2
		6/10/2002	<0.45	<0.68	<0.82	<1.7	<0.43	<0.94
		11/5/2003	<0.3	<0.58	<0.6	<1.2	<0.58	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/28/2005	<0.14	<0.36	<0.4	<0.74	<0.36	<0.4
		10/19/2006	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25
		11/1/2007	<0.25	<0.11	<0.22	<0.39	<0.23	<0.25
		11/18/2008	<0.25	<0.25	<0.22	<0.39	<0.23	<0.25
		12/4/2009	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/9/2010	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/30/2011	<0.39	<0.42	<0.41	<1.25	<0.38	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	<1	<1
	11/4/2013	<0.5	<0.5	<0.5	<1	<1	<1	
	11/6/2014	<0.5	<0.5	<0.5	<1	<1	<1	
	9/26/2016	<0.5	<0.5	<0.5	<1	<1	<1	
	9/21/2017	<0.5	<0.5	<0.5	<1.5	<0.17	<1	

Table 2

## GROUNDWATER ANALYTICAL DATA - PVOCS

CITGO Milwaukee Terminal  
9235 N 107th St  
Milwaukee, Wisconsin

Groundwater Analytical Results - PVOCS			Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	MTBE (ug/L)	Total Trimethylbenzene (ug/L)
NR 140 Enforcement Standard			5	1,000	700	10,000	60	480
NR 140 Preventive Action Limit			0.5	200	140	1,000	12	96
Sample Location	Sample Type	Sample Date						
PZ-114	DUP	4/14/2000	<0.5	<1	<1	<1	46	<2
		5/26/2000	<0.1	<0.1	<0.25	<0.25	16	<0.2
		6/10/2002	<0.45	<0.68	<0.82	<1.7	25	<0.94
		11/5/2003	<0.3	<0.58	<0.6	<1.2	41	<0.66
		11/29/2004	<0.14	<0.36	<0.4	<0.74	45	<0.4
		10/28/2005	<0.14	<0.36	<0.4	<0.74	52	<0.4
		10/19/2006	<0.25	<0.11	<0.22	<0.39	34	<0.25
		11/1/2007	<0.25	<0.11	<0.22	<0.39	33	<0.25
		11/18/2008	<0.25	<0.25	<0.22	<0.39	17	<0.25
		11/18/2008	<0.25	<0.25	<0.22	<0.39	31	<0.25
		12/4/2009	<0.39	<0.42	<0.41	<1.25	54.8	<0.83
		11/10/2010	<0.39	<0.42	<0.41	<1.25	52	<0.83
		11/30/2011	<0.39	<0.42	<0.41	<1.25	40.2	<0.83
		11/7/2012	<0.5	<0.5	<0.5	<1	48	<1
		11/4/2013	<0.5	<0.5	<0.5	<1	39	<1
11/6/2014	<0.5	<0.5	<0.5	<1	33	<1		
9/26/2016	<0.5	<0.5	<0.5	<1	36	<1		
9/21/2017	<0.5	<0.5	<0.5	<1.5	47.2	<1		

## NOTES:

1. µg/L = Parts per billion
2. <# or ND = Not detected above the laboratory method detection limit
3. **Bold** = Exceeds NR 140 PAL
4. --- or NT = Not tested
5. **Bold/Italics** = Exceeds NR 140 ES
6. Q = Analyte detected between the limit of detection and the limit of quantitation
7. J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
8. DUP = Duplicate
9. RL3 = Reporting limit raised due to high concentrations of non-target analytes



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**APPENDIX A**

Groundwater Analytical Laboratory Report



September 28, 2017

Amber Verbick  
Groundwater & Environmental Services, Inc.  
1050 Corporate Blvd  
Suite C  
Aurora, IL 60505

RE: Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

Dear Amber Verbick:

Enclosed are the analytical results for sample(s) received by the laboratory on September 23, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Christopher Hyska  
christopher.hyska@pacelabs.com  
(920)469-2436  
Project Manager

Enclosures

cc: GES Chicago



### REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

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### Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302  
Florida/NELAP Certification #: E87948  
Illinois Certification #: 200050  
Kentucky UST Certification #: 82  
Louisiana Certification #: 04168  
Minnesota Certification #: 055-999-334  
New York Certification #: 12064  
North Dakota Certification #: R-150

Virginia VELAP ID: 460263  
South Carolina Certification #: 83006001  
Texas Certification #: T104704529-14-1  
Wisconsin Certification #: 405132750  
Wisconsin DATCP Certification #: 105-444  
USDA Soil Permit #: P330-16-00157  
Federal Fish & Wildlife Permit #: LE51774A-0

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### SAMPLE SUMMARY

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40157316001	MW-101	Water	09/21/17 10:50	09/23/17 08:15
40157316002	MW-103	Water	09/21/17 09:10	09/23/17 08:15
40157316003	MW-104	Water	09/21/17 10:10	09/23/17 08:15
40157316004	MW-105	Water	09/21/17 11:15	09/23/17 08:15
40157316005	MW-112	Water	09/21/17 09:40	09/23/17 08:15
40157316006	MW-113	Water	09/21/17 12:10	09/23/17 08:15
40157316007	PZ-101	Water	09/21/17 10:40	09/23/17 08:15
40157316008	PZ-113	Water	09/21/17 12:15	09/23/17 08:15
40157316009	PZ-114	Water	09/21/17 11:45	09/23/17 08:15
40157316010	DUP-1	Water	09/21/17 09:15	09/23/17 08:15
40157316011	TRIP BLANKS	Water	09/21/17 00:00	09/23/17 08:15

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### SAMPLE ANALYTE COUNT

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

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Lab ID	Sample ID	Method	Analysts	Analytes Reported
40157316001	MW-101	EPA 8260	HNW	12
40157316002	MW-103	EPA 8260	HNW	12
40157316003	MW-104	EPA 8260	HNW	12
40157316004	MW-105	EPA 8260	HNW	12
40157316005	MW-112	EPA 8260	HNW	12
40157316006	MW-113	EPA 8260	HNW	12
40157316007	PZ-101	EPA 8260	HNW	12
40157316008	PZ-113	EPA 8260	HNW	12
40157316009	PZ-114	EPA 8260	HNW	12
40157316010	DUP-1	EPA 8260	HNW	12
40157316011	TRIP BLANKS	EPA 8260	HNW	12

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### SUMMARY OF DETECTION

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>40157316001</b>	<b>MW-101</b>					
EPA 8260	Methyl-tert-butyl ether	0.21J	ug/L	1.0	09/27/17 07:54	R1
<b>40157316002</b>	<b>MW-103</b>					
EPA 8260	Methyl-tert-butyl ether	43.3	ug/L	1.0	09/27/17 10:28	
<b>40157316004</b>	<b>MW-105</b>					
EPA 8260	Toluene	1.8	ug/L	1.0	09/27/17 11:13	
<b>40157316007</b>	<b>PZ-101</b>					
EPA 8260	Benzene	24.5	ug/L	1.0	09/27/17 18:04	
EPA 8260	Methyl-tert-butyl ether	6.3	ug/L	1.0	09/27/17 18:04	
<b>40157316009</b>	<b>PZ-114</b>					
EPA 8260	Methyl-tert-butyl ether	47.2	ug/L	1.0	09/27/17 12:41	
<b>40157316010</b>	<b>DUP-1</b>					
EPA 8260	Methyl-tert-butyl ether	43.5	ug/L	1.0	09/27/17 13:03	

### REPORT OF LABORATORY ANALYSIS

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: MW-101 Lab ID: 40157316001 Collected: 09/21/17 10:50 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 07:54	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 07:54	100-41-4	
Methyl-tert-butyl ether	0.21J	ug/L	1.0	0.17	1		09/27/17 07:54	1634-04-4	R1
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 07:54	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 07:54	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 07:54	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 07:54	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 07:54	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 07:54	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	91	%	67-130		1		09/27/17 07:54	1868-53-7	
Toluene-d8 (S)	108	%	70-130		1		09/27/17 07:54	2037-26-5	
4-Bromofluorobenzene (S)	87	%	61-130		1		09/27/17 07:54	460-00-4	

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: MW-103 Lab ID: 40157316002 Collected: 09/21/17 09:10 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:28	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:28	100-41-4	
Methyl-tert-butyl ether	43.3	ug/L	1.0	0.17	1		09/27/17 10:28	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:28	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:28	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:28	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 10:28	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 10:28	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:28	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	93	%	67-130		1		09/27/17 10:28	1868-53-7	
Toluene-d8 (S)	107	%	70-130		1		09/27/17 10:28	2037-26-5	
4-Bromofluorobenzene (S)	85	%	61-130		1		09/27/17 10:28	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: MW-104 Lab ID: 40157316003 Collected: 09/21/17 10:10 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:51	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:51	100-41-4	
Methyl-tert-butyl ether	<0.17	ug/L	1.0	0.17	1		09/27/17 10:51	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:51	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:51	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:51	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 10:51	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 10:51	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 10:51	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	89	%	67-130		1		09/27/17 10:51	1868-53-7	
Toluene-d8 (S)	106	%	70-130		1		09/27/17 10:51	2037-26-5	
4-Bromofluorobenzene (S)	87	%	61-130		1		09/27/17 10:51	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: MW-105 Lab ID: 40157316004 Collected: 09/21/17 11:15 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:13	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:13	100-41-4	
Methyl-tert-butyl ether	<0.17	ug/L	1.0	0.17	1		09/27/17 11:13	1634-04-4	
Toluene	1.8	ug/L	1.0	0.50	1		09/27/17 11:13	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:13	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:13	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 11:13	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 11:13	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:13	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	91	%	67-130		1		09/27/17 11:13	1868-53-7	
Toluene-d8 (S)	107	%	70-130		1		09/27/17 11:13	2037-26-5	
4-Bromofluorobenzene (S)	85	%	61-130		1		09/27/17 11:13	460-00-4	

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### ANALYTICAL RESULTS

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: MW-112 Lab ID: 40157316005 Collected: 09/21/17 09:40 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:35	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:35	100-41-4	
Methyl-tert-butyl ether	<0.17	ug/L	1.0	0.17	1		09/27/17 11:35	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:35	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:35	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:35	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 11:35	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 11:35	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:35	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	92	%	67-130		1		09/27/17 11:35	1868-53-7	
Toluene-d8 (S)	110	%	70-130		1		09/27/17 11:35	2037-26-5	
4-Bromofluorobenzene (S)	85	%	61-130		1		09/27/17 11:35	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE

Pace Project No.: 40157316

Sample: MW-113 Lab ID: 40157316006 Collected: 09/21/17 12:10 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:57	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:57	100-41-4	
Methyl-tert-butyl ether	<0.17	ug/L	1.0	0.17	1		09/27/17 11:57	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:57	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:57	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:57	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 11:57	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 11:57	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 11:57	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	93	%	67-130		1		09/27/17 11:57	1868-53-7	
Toluene-d8 (S)	107	%	70-130		1		09/27/17 11:57	2037-26-5	
4-Bromofluorobenzene (S)	86	%	61-130		1		09/27/17 11:57	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: PZ-101 Lab ID: 40157316007 Collected: 09/21/17 10:40 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	24.5	ug/L	1.0	0.50	1		09/27/17 18:04	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 18:04	100-41-4	
Methyl-tert-butyl ether	6.3	ug/L	1.0	0.17	1		09/27/17 18:04	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 18:04	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 18:04	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 18:04	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 18:04	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 18:04	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 18:04	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	90	%	67-130		1		09/27/17 18:04	1868-53-7	
Toluene-d8 (S)	106	%	70-130		1		09/27/17 18:04	2037-26-5	
4-Bromofluorobenzene (S)	86	%	61-130		1		09/27/17 18:04	460-00-4	

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### ANALYTICAL RESULTS

Project: 1404575/06/206 CITGO MILWAUKEE

Pace Project No.: 40157316

**Sample: PZ-113**      **Lab ID: 40157316008**      Collected: 09/21/17 12:15      Received: 09/23/17 08:15      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>									
Analytical Method: EPA 8260									
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:19	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:19	100-41-4	
Methyl-tert-butyl ether	<0.17	ug/L	1.0	0.17	1		09/27/17 12:19	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:19	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:19	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:19	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 12:19	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 12:19	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:19	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	91	%	67-130		1		09/27/17 12:19	1868-53-7	
Toluene-d8 (S)	110	%	70-130		1		09/27/17 12:19	2037-26-5	
4-Bromofluorobenzene (S)	86	%	61-130		1		09/27/17 12:19	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: PZ-114 Lab ID: 40157316009 Collected: 09/21/17 11:45 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:41	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:41	100-41-4	
Methyl-tert-butyl ether	47.2	ug/L	1.0	0.17	1		09/27/17 12:41	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:41	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:41	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:41	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 12:41	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 12:41	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 12:41	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	90	%	67-130		1		09/27/17 12:41	1868-53-7	
Toluene-d8 (S)	112	%	70-130		1		09/27/17 12:41	2037-26-5	
4-Bromofluorobenzene (S)	84	%	61-130		1		09/27/17 12:41	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: DUP-1 Lab ID: 40157316010 Collected: 09/21/17 09:15 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 13:03	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 13:03	100-41-4	
Methyl-tert-butyl ether	43.5	ug/L	1.0	0.17	1		09/27/17 13:03	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 13:03	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 13:03	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 13:03	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 13:03	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 13:03	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 13:03	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	93	%	67-130		1		09/27/17 13:03	1868-53-7	
Toluene-d8 (S)	110	%	70-130		1		09/27/17 13:03	2037-26-5	
4-Bromofluorobenzene (S)	86	%	61-130		1		09/27/17 13:03	460-00-4	

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**ANALYTICAL RESULTS**

Project: 1404575/06/206 CITGO MILWAUKEE  
 Pace Project No.: 40157316

Sample: TRIP BLANKS Lab ID: 40157316011 Collected: 09/21/17 00:00 Received: 09/23/17 08:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260 MSV UST</b>		Analytical Method: EPA 8260							
Benzene	<0.50	ug/L	1.0	0.50	1		09/27/17 16:58	71-43-2	
Ethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 16:58	100-41-4	
Methyl-tert-butyl ether	<0.17	ug/L	1.0	0.17	1		09/27/17 16:58	1634-04-4	
Toluene	<0.50	ug/L	1.0	0.50	1		09/27/17 16:58	108-88-3	
1,2,4-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 16:58	95-63-6	
1,3,5-Trimethylbenzene	<0.50	ug/L	1.0	0.50	1		09/27/17 16:58	108-67-8	
Xylene (Total)	<0.0015	mg/L	0.0030	0.0015	1		09/27/17 16:58	1330-20-7	
m&p-Xylene	<1.0	ug/L	2.0	1.0	1		09/27/17 16:58	179601-23-1	
o-Xylene	<0.50	ug/L	1.0	0.50	1		09/27/17 16:58	95-47-6	
<b>Surrogates</b>									
Dibromofluoromethane (S)	89	%	67-130		1		09/27/17 16:58	1868-53-7	
Toluene-d8 (S)	109	%	70-130		1		09/27/17 16:58	2037-26-5	
4-Bromofluorobenzene (S)	85	%	61-130		1		09/27/17 16:58	460-00-4	

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### QUALITY CONTROL DATA

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

QC Batch: 268511 Analysis Method: EPA 8260  
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV UST-WATER  
Associated Lab Samples: 40157316001, 40157316002, 40157316003, 40157316004, 40157316005, 40157316006, 40157316007, 40157316008, 40157316009, 40157316010, 40157316011

METHOD BLANK: 1577627 Matrix: Water  
Associated Lab Samples: 40157316001, 40157316002, 40157316003, 40157316004, 40157316005, 40157316006, 40157316007, 40157316008, 40157316009, 40157316010, 40157316011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.50	1.0	09/26/17 16:20	
1,3,5-Trimethylbenzene	ug/L	<0.50	1.0	09/26/17 16:20	
Benzene	ug/L	<0.50	1.0	09/26/17 16:20	
Ethylbenzene	ug/L	<0.50	1.0	09/26/17 16:20	
m&p-Xylene	ug/L	<1.0	2.0	09/26/17 16:20	
Methyl-tert-butyl ether	ug/L	<0.17	1.0	09/26/17 16:20	
o-Xylene	ug/L	<0.50	1.0	09/26/17 16:20	
Toluene	ug/L	<0.50	1.0	09/26/17 16:20	
Xylene (Total)	mg/L	<0.0015	0.0030	09/26/17 16:20	
4-Bromofluorobenzene (S)	%	84	61-130	09/26/17 16:20	
Dibromofluoromethane (S)	%	92	67-130	09/26/17 16:20	
Toluene-d8 (S)	%	107	70-130	09/26/17 16:20	

LABORATORY CONTROL SAMPLE: 1577628

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	50	43.6	87	73-145	
Ethylbenzene	ug/L	50	56.9	114	87-129	
m&p-Xylene	ug/L	100	120	120	70-130	
Methyl-tert-butyl ether	ug/L	50	52.3	105	66-143	
o-Xylene	ug/L	50	56.6	113	70-130	
Toluene	ug/L	50	54.3	109	82-130	
Xylene (Total)	mg/L	.15	0.18	118	70-130	
4-Bromofluorobenzene (S)	%			99	61-130	
Dibromofluoromethane (S)	%			91	67-130	
Toluene-d8 (S)	%			108	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1577629 1577630

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		40157316001 Result	Spike Conc.	Spike Conc.	RPD						RPD		
Benzene	ug/L	<0.50	50	50	40.4	39.8	81	80	73-145	2	20		
Ethylbenzene	ug/L	<0.50	50	50	52.7	50.9	105	102	87-129	3	20		
m&p-Xylene	ug/L	<1.0	100	100	110	109	110	109	70-130	1	20		
Methyl-tert-butyl ether	ug/L	0.21J	50	50	50.2	37.5	100	75	66-143	29	20	R1	
o-Xylene	ug/L	<0.50	50	50	52.9	51.5	106	103	70-130	3	20		
Toluene	ug/L	<0.50	50	50	50.1	49.2	100	98	82-131	2	20		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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**QUALITY CONTROL DATA**

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1577629		1577630		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		40157316001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result	RPD	
Xylene (Total)	mg/L	<0.0015	.15	.15	0.16	0.16		108	107	70-130	2	20	
4-Bromofluorobenzene (S)	%							101	103	61-130			
Dibromofluoromethane (S)	%							92	93	67-130			
Toluene-d8 (S)	%							107	108	70-130			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1404575/06/206 CITGO MILWAUKEE  
Pace Project No.: 40157316

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40157316001	MW-101	EPA 8260	268511		
40157316002	MW-103	EPA 8260	268511		
40157316003	MW-104	EPA 8260	268511		
40157316004	MW-105	EPA 8260	268511		
40157316005	MW-112	EPA 8260	268511		
40157316006	MW-113	EPA 8260	268511		
40157316007	PZ-101	EPA 8260	268511		
40157316008	PZ-113	EPA 8260	268511		
40157316009	PZ-114	EPA 8260	268511		
40157316010	DUP-1	EPA 8260	268511		
40157316011	TRIP BLANKS	EPA 8260	268511		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

Pace Analytical Services, LLC. - Green Bay WI
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Client Name: GBS, Inc

Project # WO#: 40157316

Courier: Fed Ex UPS Client Pace Other: CS Logistics



Tracking #:
Custody Seal on Cooler/Box Present: Yes no Seals intact: Yes no
Custody Seal on Samples Present: Yes no Seals intact: Yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used SR-53 Type of Ice: Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature Uncorr: 2.5 / Corr: 2.5 Biological Tissue is Frozen: Yes no
Temp Blank Present: Yes no

Person examining contents:
Date: 9/23/17
Initials: SSM

Table with 15 rows for Chain of Custody Present, Chain of Custody Filled Out, Chain of Custody Relinquished, Sampler Name & Signature on COC, Samples Arrived within Hold Time, Short Hold Time Analysis (<72hr), Rush Turn Around Time Requested, Sufficient Volume, Correct Containers Used, Containers Intact, Filtered volume received for Dissolved tests, Sample Labels match COC, All containers needing preservation have been checked, All containers needing preservation are found to be in compliance with EPA recommendation, Headspace in VOA Vials (>6mm), Trip Blank Present, Trip Blank Custody Seals Present, Pace Trip Blank Lot # (if purchased).

Client Notification/ Resolution:
Person Contacted: Date/Time:
Comments/ Resolution:

Project Manager Review: Date: 9/25/17



<b>SENDER: COMPLETE THIS SECTION</b>		<b>COMPLETE THIS SECTION ON DELIVERY</b>	
<ul style="list-style-type: none"> <li>Complete items 1, 2, and 3.</li> <li>Print your name and address on the reverse so that we can return the card to you.</li> <li>Attach this card to the back of the mailpiece, or on the front if space permits.</li> </ul>		<b>A. Signature</b> <input checked="" type="checkbox"/> <i>Scott Buckner</i> <input type="checkbox"/> Agent <input type="checkbox"/> Addressee	
<b>1. Article Addressed to:</b>  Mr. Scott Buckner CITGO Petroleum Corporation 2316 Terminal Drive Arlington Heights, IL 60005		<b>B. Received by (Printed Name)</b>	<b>C. Date of Delivery</b> 12/05/17
<b>2. Article Number (Printed on Service Label)</b> 7015 3010 0001 6085 9509		<b>D. Is delivery address different from item 1?</b> <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No  <b>RECEIVED DEC 12 2017</b>	
<b>3. Service Type</b> <input type="checkbox"/> Adult Signature <input type="checkbox"/> Adult Signature Restricted Delivery <input checked="" type="checkbox"/> Certified Mail® <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Collect on Delivery Restricted Delivery		<input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Registered Mail Restricted Delivery <input checked="" type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Signature Confirmation Restricted Delivery	
PS Form 3811, July 2015 PSN 7530-02-000-9053		Domestic Return Receipt	

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 Suite C  
 Aurora, IL 60505

*Citgo 1404575/06/122 - 2017 Annual GWM*

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<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$2.87
<b>Total Postage and Fees</b>	<b>\$8.97</b>

Sent To: Mr. Scott Buckner  
 Street and Apt. No: CITGO Petroleum Corporation  
 2316 Terminal Drive  
 City, State, ZIP+4: Arlington Heights, IL 60005

  
 0519 05  
 12/05/2017

PS Form 3800, A