



August 19, 2021

Krystal Peltzer, Property Manager  
RPAI US Management LLC  
5731 Main Street Southwest  
Lakewood, Washington 98499

Subject: August 2021 Ground Water Quality Status Report—Lakewood Towne Center

Dear Krystal:

Enclosed is our report documenting the results of the August 2021 ground water sampling event conducted at the Lakewood Towne Center site in Lakewood, Washington.

Sincerely,

Herrera Environmental Consultants, Inc.

George Iftner, L.G.  
Associate Scientist

Enclosure: August 2021 Ground Water Quality Status Report—Lakewood Towne Center



**Note:**

Some pages in this document have been purposely skipped or blank pages inserted so that this document will print correctly when duplexed.

# AUGUST 2021 GROUND WATER QUALITY STATUS REPORT

LAKWOOD TOWNE CENTER  
5731 MAIN STREET SOUTHWEST  
LAKWOOD, WASHINGTON

Prepared for  
RPAI US Management LLC  
5731 Main Street Southwest  
Lakewood, Washington 98499



Bruce Allan Carpenter

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DRAFT  
August 19, 2021



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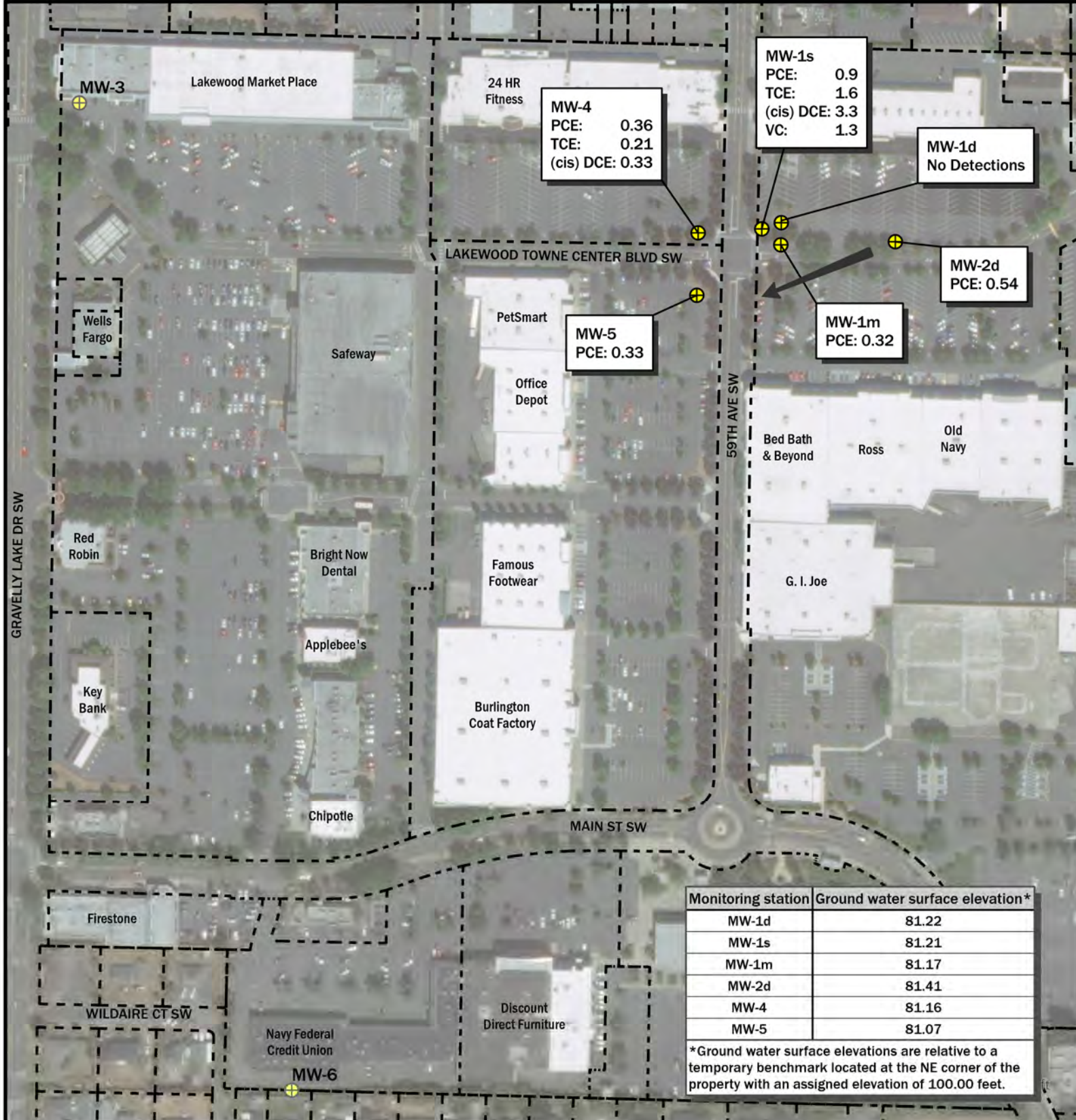


## INTRODUCTION

This report summarizes field activities and analytical results of the August 2021 ground water monitoring event conducted at the Lakewood Towne Center site in Lakewood, Washington. Since the Lakewood Towne Center site characterization project began in the summer of 2000, Herrera Environmental Consultants, Inc. (Herrera) has prepared the following deliverables:

Date	Deliverables
May 2000	Phase I Environmental Site Assessment
February 2001	Phase II Environmental Site Assessment
March 2001	Ground Water Quarterly Status Report (first quarter)
June 2001	Ground Water Quarterly Status Report (second quarter)
September 2001	Ground Water Quarterly Status Report (third quarter)
January 2002	Ground Water Monitoring Annual Summary Report (fourth quarter and first year summary)
February 2002	Updated Phase I Environmental Site Assessment
March 2002	Ground Water Quarterly Status Report (fifth quarter)
June 2002	Limited Phase II Site Investigation and Ground Water Quarterly Status Report (sixth quarter)
October 2002	Ground Water Quarterly Status Report (seventh quarter)
January 2003	Ground Water Monitoring Annual Summary Report (eighth quarter and second year summary)
April 2003	Ground Water Quarterly Status Report (ninth quarter)
August 2003	Ground Water Quarterly Status Report (tenth quarter)
August 2006	August 2006 Ground Water Quality Status Report
February 2007	February 2007 Ground Water Quality Status Report
September 2007	September 2007 Ground Water Quality Status Report
April 2008	March 2008 Ground Water Quality Status Report
November 2008	September 2008 Ground Water Quality Status Report
October 2009	September 2009 Ground Water Quality Status Report
June 2010	May 2010 Ground Water Quality Status Report
December 2010	November 2010 Ground Water Quality Status Report
June 2011	May 2011 Ground Water Quality Status Report
December 2011	November 2011 Ground Water Quality Status Report
June 2012	May 2012 Ground Water Quality Status Report
November 2012	November 2012 Ground Water Quality Status Report

Monitoring and analytical results from quarterly, semi-annual, and annual sampling events conducted since the ground water monitoring program began in July/September 2000 indicate that a dry cleaner solvent, perchloroethylene (PCE), has been detected in ground water across the northwest portion of the site. The main source was identified by the presence of elevated PCE and its degradation by-products in shallow ground water near the former East Concourse building, which was occupied by a dry cleaner between 1968 and 1987.



MW-1s  
 PCE: 0.9  
 TCE: 1.6  
 (cis) DCE: 3.3  
 VC: 1.3

MW-1d  
 No Detections

MW-4  
 PCE: 0.36  
 TCE: 0.21  
 (cis) DCE: 0.33

MW-2d  
 PCE: 0.54

MW-5  
 PCE: 0.33

MW-1m  
 PCE: 0.32

Monitoring station	Ground water surface elevation*
MW-1d	81.22
MW-1s	81.21
MW-1m	81.17
MW-2d	81.41
MW-4	81.16
MW-5	81.07

\*Ground water surface elevations are relative to a temporary benchmark located at the NE corner of the property with an assigned elevation of 100.00 feet.

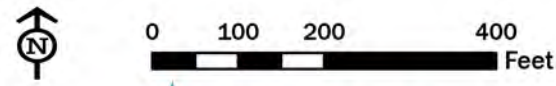
**Legend**

- Property boundary
- Monitoring well location
- Monitoring well location (not sampled)
- Estimated direction of ground water flow

Key:  
 PCE - Perchloroethylene  
 TCE - Trichloroethene  
 DCE - Dichloroethene  
 VC - Vinyl Chloride  
 HVOCs - Halogenated volatile organic compounds

Note:  
 Values for HVOC concentrations reported in µg/L.  
 Only detected HVOC values are shown.

**Figure 1. HVOC Concentrations in Ground Water and Inferred Ground Water Flow Direction, August 4, 2021, Lakewood Towne Center, Lakewood, Washington.**



As part of site characterization activities and the implementation of a ground water monitoring program for the Lakewood Towne Center site, seven ground water monitoring wells were installed in 2001 in the following locations (Figure 1):

- MW-1s (shallow), MW-1m (mid depth), and MW-1d (deep) in the source area
- MW-2d (deep) upgradient of the source area
- MW-3 (shallow) at the northwest corner of the former mall complex, approximately 1,300 feet downgradient of the source area (this is no longer a part of the RPAI US Management property)
- MW-4 (shallow) immediately downgradient of the source area
- MW-5 (shallow) immediately downgradient of the source area

Contaminants of concern (COCs) found at the Lakewood Towne Center site from these wells since ground water monitoring began in spring of 2000 include:

- PCE—perchloroethylene or tetrachloroethylene
- TCE—trichloroethylene
- cis DCE—cis 1,2-dichloroethylene
- trans DCE—trans 1,2-dichloroethylene
- 1,1 DCE—1,1-dichloroethene
- 1,1 DCA—1,1-dichloroethane
- 1,3 DCB—1,3-dichlorobenzene
- 1,4 DCB—1,4-dichlorobenzene
- Vinyl chloride
- Chloroform

Of the COCs listed above, only one contaminant, vinyl chloride, was detected above the MTCA Method A and B cleanup levels (CULs). PCE degradation has occurred in ground water at the site, as indicated by the concentrations of vinyl chloride and other PCE degradation by-products detected in shallow well MW-1s. Low concentrations of PCE and up to three of its associated contaminants have spread downgradient across the northwest quadrant of the Lakewood Towne Center site at levels below MTCA method A and B CULs.

In October 2003, Brown & Caldwell (B&C) was contracted by MBK Northwest Inc. (property owner of the former mall site at the time) to inject hydrogen release compound (HRC) at six shallow boring locations in the vicinity and upgradient of MW-1s to promote biodegradation of PCE (B&C 2004a). Within a month following treatment, PCE, TCE, and cis DCE concentrations declined and vinyl chloride increased at MW-1s, indicating local biodegradation taking place. Further evidence of biodegradation is provided in samples collected 3 months later, with increased concentrations of biological breakdown daughter products cis DCE and vinyl chloride.

Samples collected over the next 9 years after the biodegradation treatment indicated PCE concentrations at MW-1s below the MTCA method A CUL of 5 µg/L, except for the sample collected in February 2007, where PCE was detected slightly above the CUL. Approximately 6 months following treatment, concentrations of its degradation by-products returned to pre-treatment levels and have slowly declined since that time (mid 2007).

Shallow wells MW-1s, MW-4, and MW-5, and deeper wells MW-1m, MW-1d, and MW-2d were monitored and sampled on a semi-annual basis from August 2006 to September 2008. Annual sampling was performed in September 2009 and monitoring returned to semi-annual intervals in May 2010.

# AUGUST 2021 GROUND WATER MONITORING EVENT SUMMARY

Ground water samples were collected from wells MW-1s, MW-1m, MW-1d, MW-2d, MW-4, and MW-5 on August 4, 2021. All analytical results of ground water samples collected during quarterly, semi-annual, or annual sampling events from July/September 2000 through August 2021 are summarized in Table 1. Results of the August 2021 ground water sampling event are discussed below.

## Ground Water Conditions

Static ground water levels were encountered at depths ranging from 10.79 feet below ground surface in well MW-2d to 13.66 feet below ground surface in well MW-4. Ground water elevation data collected from these wells indicate a general ground water flow direction toward the west-southwest, with an average hydraulic gradient of less than 0.01 feet per foot. The overall flow direction and gradient are generally consistent with previous monitoring data collected during quarterly monitoring events starting in July 2000.

## Sampling Procedure and Analysis

Ground water samples were collected for chemical analysis from the six wells using a low-flow purge method with dedicated polyethylene tubing and a peristaltic pump. Sample MW-Dup was a field duplicate sample collected from well MW-5. Water samples were submitted to OnSite Environmental, Inc. of Redmond, Washington, for analysis of halogenated volatile organic compounds (HVOCs) using U.S. Environmental Protection Agency (EPA) Method 8260D. All of the analytical results were determined to be acceptable for use. The complete laboratory analytical report and a data quality assurance review summary are provided at the end of this report in Attachment A. Ground water sampling field notes are provided in Attachment B.

**Table 1. HVOC Results for Ground Water Samples Collected at the Lakewood Towne Center Site (µg/L).**

Well Identification	Date Sampled	PCE	TCE	cis DCE	trans DCE	1,1-DCE	1,1-DCA	Vinyl chloride	1,3-DCB	1,4-DCB	Chloroform
MTCA method A cleanup level <sup>a</sup>		5	5	na	na	na	na	0.2	na	na	na
MTCA method B cleanup level <sup>b</sup>		21	0.54	16	160	400	7.7	0.029	na	8.1	1.4
MW-1s	9/15/00	<b>2.2</b>	<b>19</b>	<b>670</b>	<b>14</b>	<b>0.76</b>	<b>6.1</b>	<b>52</b>	(0.20)	<b>0.25</b>	1.3
	2/12/01	<b>1.2</b>	<b>15</b>	<b>390</b>	<b>8.2</b>	<b>0.37</b>	<b>3.1</b>	<b>47</b>	(0.20)	(0.20)	(0.20)
	5/17/01	<b>2.3</b>	<b>18</b>	<b>600</b>	<b>10</b>	<b>0.64</b>	<b>5.5</b>	<b>41</b>	(0.20)	<b>0.30</b>	(0.20)
	8/15/01	<b>1.7</b>	<b>14</b>	<b>490</b>	<b>8.3</b>	<b>0.56</b>	<b>4.2</b>	<b>40</b>	(0.20)	(0.20)	(0.20)
	11/15/01	<b>0.51</b>	<b>9.1</b>	<b>320</b>	<b>6.4</b>	<b>0.47</b>	<b>2.3</b>	<b>59</b>	(0.20)	<b>0.21</b>	(0.20)
	2/20/02	<b>37</b>	<b>68</b>	<b>540</b>	<b>7.2</b>	<b>0.83</b>	<b>3.1</b>	<b>28</b>	(0.20)	<b>0.35</b>	(0.20)
	5/20/02	<b>18</b>	<b>37</b>	<b>520</b>	<b>8.3</b>	<b>0.61</b>	<b>2.3</b>	<b>25</b>	(0.20)	<b>0.32</b>	(0.20)
	8/19/02	<b>5.5</b>	<b>16</b>	<b>540</b>	<b>7.3</b>	(2.0)	(2.0)	<b>31</b>	(2.0)	(2.0)	(2.0)
	11/20/02	<b>2.8</b>	<b>17</b>	<b>330</b>	<b>8.5</b>	<b>1.0</b>	(0.20)	<b>58</b>	(0.20)	(0.20)	(0.20)
	2/20/03	<b>5.8</b>	<b>18</b>	<b>290</b>	<b>3.6</b>	(2.0)	(2.0)	<b>22</b>	(2.0)	(2.0)	(2.0)
	5/21/03	<b>10</b>	<b>28</b>	<b>470</b>	<b>6.7</b>	<b>0.55</b>	(0.20)	<b>24</b>	(0.20)	<b>0.23</b>	(0.20)
	8/21/03	<b>7.1</b>	<b>20</b>	<b>400</b>	<b>6.6</b>	(2.0)	(2.0)	<b>24</b>	(2.0)	(2.0)	(2.0)
B&C	11/26/03	(5.0)	<b>13.2</b>	<b>212</b>	(5.0)	(5.0)	(5.0)	<b>30.1</b>	(5.0)	(5.0)	(5.0)
B&C	3/3/04	<b>1.55</b>	<b>6.26</b>	<b>420</b>	<b>6.77</b>	(1.0)	<b>1.44</b>	<b>91.8</b>	(1.0)	(1.0)	(1.0)
	8/16/06	<b>4.3</b>	<b>15</b>	<b>220</b>	<b>2.9</b>	(2.0)	(2.0)	<b>28</b>	(2.0)	(2.0)	(2.0)
	2/14/07	<b>7.3</b>	<b>26</b>	<b>370</b>	<b>3.9</b>	(2.0)	(2.0)	<b>20</b>	(2.0)	(2.0)	(2.0)
	9/24/07	<b>3.5</b>	<b>9.5</b>	<b>140</b>	<b>2.4</b>	(1.0)	(1.0)	<b>20</b>	(1.0)	(1.0)	(1.0)
	3/13/08	<b>3.5</b>	<b>13</b>	<b>370</b>	<b>3.7</b>	(2.0)	(2.0)	<b>26</b>	(2.0)	(2.0)	(2.0)
	9/26/08	<b>2.6</b>	<b>7.4</b>	<b>110</b>	<b>1.4</b>	(0.40)	(0.40)	<b>16</b>	(0.40)	(0.40)	(0.40)
	9/24/09	<b>2.7</b>	<b>7.4</b>	<b>95</b>	<b>1.3</b>	(0.40)	(0.40)	<b>14</b>	(0.40)	(0.40)	(0.40)
	5/12/10	<b>3.5</b>	<b>9.3</b>	<b>260</b>	<b>2.8</b>	(2.0)	(2.0)	<b>17</b>	(2.0)	(2.0)	(2.0)
	11/18/10	(1.0)	<b>6.7</b>	<b>110</b>	<b>1.6</b>	(1.0)	(1.0)	<b>17</b>	(1.0)	(1.0)	(1.0)
	5/19/11	<b>2.4</b>	<b>5.1</b>	<b>120</b>	<b>1.5</b>	(1.0)	(1.0)	<b>9.2</b>	(1.0)	(1.0)	(1.0)

**Table 1 (continued). HVOC Results for Ground Water Samples Collected at the Lakewood Towne Center Site (µg/L).**

Well Identification	Date Sampled	PCE	TCE	cis DCE	trans DCE	1,1-DCE	1,1-DCA	Vinyl chloride	1,3-DCB	1,4-DCB	Chloroform
MTCA method A cleanup level <sup>a</sup>		5	5	na	na	na	na	0.2	na	na	na
MTCA method B cleanup level <sup>b</sup>		21	0.54	16	160	400	7.7	0.029	na	8.1	1.4
	11/22/11	<b>1.2</b>	<b>4.9</b>	<b>83</b>	<b>1.2</b>	(1.0)	(1.0)	<b>15</b>	(1.0)	(1.0)	(1.0)
	5/24/12	<b>2.1</b>	<b>5.1</b>	<b>130</b>	<b>1.4</b>	(0.20)	<b>0.22</b>	<b>9</b>	(0.20)	(0.20)	(0.20)
	11/8/12	<b>1.6</b>	<b>4.2</b>	<b>61</b>	<b>0.88</b>	(0.40)	(0.40)	<b>11</b>	(0.40)	(0.40)	(0.40)
	8/4/21	<b>0.90</b>	<b>1.6</b>	<b>3.3</b>	(0.20)	(0.20)	(0.20)	<b>1.3</b>	(0.20)	(0.20)	(0.20)
MW-1m	7/21/00	<b>0.80</b>	<b>0.45</b>	<b>5.0</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/15/01	<b>0.87</b>	(0.20)	<b>0.95</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/20/02	<b>0.69</b>	<b>0.24</b>	<b>0.93</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	11/26/03	<b>1.91</b>	<b>0.520</b>	<b>2.74</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-1m (continued)	8/16/06	<b>0.65</b>	<b>0.25</b>	<b>1.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/14/07	<b>0.76</b>	<b>0.89</b>	<b>6.0</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/07	<b>0.60</b>	(0.20)	<b>0.45</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	3/13/08	<b>0.60</b>	<b>0.39</b>	<b>5.9</b>	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.32</b>	(0.20)	(0.20)
	9/26/08	<b>0.49</b>	(0.20)	<b>0.41</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/09	<b>0.63</b>	(0.20)	<b>0.50</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/12/10	<b>0.43</b>	(0.20)	<b>2.4</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/18/10	<b>0.55</b>	(0.20)	<b>0.68</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/19/11	<b>0.38</b>	(0.20)	<b>1.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.26</b>	(0.20)	(0.20)
	11/22/11	<b>0.42</b>	(0.20)	<b>0.26</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/24/12	<b>0.36</b>	(0.20)	<b>0.82</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/8/12	<b>0.63</b>	(0.20)	<b>0.24</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/4/21	<b>0.32</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-1d	7/21/00	<b>0.50</b>	(0.20)	<b>0.29</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/15/01	<b>0.64</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/20/02	<b>0.52</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	11/26/03	<b>0.70</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/16/06	<b>0.32</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)

**Table 1 (continued). HVOC Results for Ground Water Samples Collected at the Lakewood Towne Center Site (µg/L).**

Well Identification	Date Sampled	PCE	TCE	cis DCE	trans DCE	1,1-DCE	1,1-DCA	Vinyl chloride	1,3-DCB	1,4-DCB	Chloroform
MTCA method A cleanup level <sup>a</sup>		5	5	na	na	na	na	0.2	na	na	na
MTCA method B cleanup level <sup>b</sup>		21	0.54	16	160	400	7.7	0.029	na	8.1	1.4
	2/14/07	<b>0.24</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/07	<b>0.37</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	3/13/08	<b>0.24</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	0.29	(0.20)	(0.20)
	9/26/08	<b>0.32</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.22</b>
	9/24/09	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/12/10	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/18/10	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/19/11	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.28</b>	(0.20)	<b>0.27</b>
	11/22/11	<b>0.24</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/24/12	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.21</b>
	11/8/12	<b>0.31</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.20</b>
	8/4/21	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-2d	7/21/00	<b>0.73</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-2d (continued)	11/16/01	<b>1.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/21/02	<b>1.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	11/26/03	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/17/06	<b>4.5</b>	<b>0.28</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/14/07	<b>0.78</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/07	<b>0.45</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	3/13/08	<b>0.39</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.29</b>	(0.20)	(0.20)
	9/26/08	<b>0.41</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/09	<b>2.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/12/10	<b>0.41</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/18/10	<b>0.71</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/19/11	<b>0.45</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.41</b>	(0.20)	(0.20)
	11/22/11	<b>0.61</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)

**Table 1 (continued). HVOC Results for Ground Water Samples Collected at the Lakewood Towne Center Site (µg/L).**

Well Identification	Date Sampled	PCE	TCE	cis DCE	trans DCE	1,1-DCE	1,1-DCA	Vinyl chloride	1,3-DCB	1,4-DCB	Chloroform
MTCA method A cleanup level <sup>a</sup>		5	5	na	na	na	na	0.2	na	na	na
MTCA method B cleanup level <sup>b</sup>		21	0.54	16	160	400	7.7	0.029	na	8.1	1.4
	5/24/12	<b>0.36</b>	(0.20)	(0.50)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/8/12	<b>0.53</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/4/21	<b>0.54</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-3	7/21/00	<b>0.69</b>	(0.20)	<b>1.1</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/12/01	<b>0.66</b>	(0.20)	<b>0.23</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/17/01	<b>0.64</b>	(0.20)	<b>1.3</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/15/01	<b>0.66</b>	(0.20)	<b>0.88</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/15/01	<b>0.57</b>	(0.20)	<b>0.73</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/20/02	<b>0.66</b>	<b>0.31</b>	<b>1.3</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/20/02	<b>0.52</b>	(0.20)	<b>0.93</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/19/02	<b>0.57</b>	(0.20)	<b>0.79</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/20/02	<b>0.57</b>	(0.20)	<b>0.84</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.37</b>
	2/20/03	<b>0.68</b>	(0.20)	<b>1.1</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/21/03	<b>0.50</b>	(0.20)	<b>0.91</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/21/03	<b>0.54</b>	(0.20)	<b>0.69</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	11/26/03	<b>0.87</b>	(0.20)	<b>1.05</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	3/3/04	<b>0.60</b>	(0.20)	<b>1.03</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-4	9/15/00	<b>1.6</b>	<b>4.9</b>	<b>120</b>	<b>2.8</b>	(0.20)	<b>1.0</b>	(0.20)	(0.20)	(0.20)	(0.20)
	2/12/01	<b>1.0</b>	<b>2.3</b>	<b>48</b>	<b>0.90</b>	(0.20)	<b>0.22</b>	(0.20)	(0.20)	(0.20)	(0.20)
	5/17/01	<b>1.0</b>	<b>3.4</b>	<b>100</b>	<b>1.6</b>	(0.20)	<b>1.0</b>	(0.20)	(0.20)	(0.20)	(0.20)
	8/15/01	<b>0.97</b>	<b>2.9</b>	<b>70</b>	<b>1.1</b>	(0.20)	<b>0.68</b>	(0.20)	(0.20)	(0.20)	(0.20)
	11/15/01	<b>0.99</b>	<b>1.6</b>	<b>35</b>	<b>0.57</b>	(0.20)	<b>0.29</b>	(0.20)	(0.20)	(0.20)	(0.20)
	2/20/02	<b>9.8</b>	<b>18</b>	<b>110</b>	<b>1.3</b>	(0.20)	<b>0.71</b>	(0.20)	(0.20)	(0.20)	(0.20)
	5/20/02	<b>3.8</b>	<b>6.6</b>	<b>65</b>	<b>0.90</b>	(0.20)	<b>0.32</b>	(0.20)	(0.20)	(0.20)	(0.20)
	8/19/02	<b>2.4</b>	<b>4.2</b>	<b>77</b>	<b>1.7</b>	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)
	11/21/02	<b>1.6</b>	<b>3.7</b>	<b>38</b>	<b>0.99</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)

**Table 1 (continued). HVOC Results for Ground Water Samples Collected at the Lakewood Towne Center Site (µg/L).**

Well Identification	Date Sampled	PCE	TCE	cis DCE	trans DCE	1,1-DCE	1,1-DCA	Vinyl chloride	1,3-DCB	1,4-DCB	Chloroform
MTCA method A cleanup level <sup>a</sup>		5	5	na	na	na	na	0.2	na	na	na
MTCA method B cleanup level <sup>b</sup>		21	0.54	16	160	400	7.7	0.029	na	8.1	1.4
	2/20/03	<b>1.5</b>	<b>3.1</b>	<b>36</b>	<b>0.48</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/21/03	<b>2.4</b>	<b>4.7</b>	<b>65</b>	<b>0.97</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/21/03	<b>1.8</b>	<b>3.8</b>	<b>54</b>	<b>0.78</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	11/26/03	<b>1.73</b>	<b>2.0</b>	<b>24.8</b>	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
B&C	3/3/04	<b>2.09</b>	<b>4.07</b>	<b>75.0</b>	<b>0.880</b>	(0.20)	0.210	(0.20)	(0.20)	(0.20)	(0.20)
	8/16/06	<b>1.4</b>	<b>2.7</b>	<b>33</b>	<b>0.56</b>	(0.20)	0.210	(0.20)	(0.20)	(0.20)	(0.20)
	2/14/07	<b>1.4</b>	<b>3.7</b>	<b>49</b>	<b>0.43</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/07	<b>1.1</b>	<b>2.1</b>	<b>23</b>	<b>0.28</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	3/13/08	<b>1.1</b>	<b>2.6</b>	<b>52</b>	<b>0.51</b>	(0.20)	(0.20)	(0.20)	0.28	(0.20)	(0.20)
	9/26/08	<b>0.84</b>	<b>1.3</b>	<b>14</b>	<b>0.20</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/09	<b>1.0</b>	<b>2.0</b>	<b>23</b>	<b>0.25</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/12/10	<b>0.98</b>	<b>1.8</b>	<b>37</b>	<b>0.34</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/18/10	<b>0.66</b>	<b>0.89</b>	<b>12</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/19/11	<b>0.86</b>	<b>1.3</b>	<b>24</b>	<b>0.26</b>	(0.20)	(0.20)	(0.20)	0.32	(0.20)	(0.20)
	11/22/11	<b>0.71</b>	<b>0.73</b>	<b>9.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/24/12	<b>0.70</b>	<b>1.1</b>	<b>23</b>	<b>0.21</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/8/12	<b>0.73</b>	<b>0.75</b>	<b>9.8</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/4/21	<b>0.36</b>	<b>0.21</b>	<b>0.33</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-5	9/15/00	<b>1.2</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/12/01	<b>0.70</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/17/01	<b>0.62</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/15/01	<b>0.88</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
MW-5 (continued)	11/15/01	<b>0.90</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/20/02	<b>0.44</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/20/02	<b>0.39</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/19/02	<b>0.71</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)

<b>Well Identification</b>	<b>Date Sampled</b>	<b>PCE</b>	<b>TCE</b>	<b>cis DCE</b>	<b>trans DCE</b>	<b>1,1-DCE</b>	<b>1,1-DCA</b>	<b>Vinyl chloride</b>	<b>1,3-DCB</b>	<b>1,4-DCB</b>	<b>Chloroform</b>
MTCA method A cleanup level <sup>a</sup>		5	5	na	na	na	na	0.2	na	na	na
MTCA method B cleanup level <sup>b</sup>		21	0.54	16	160	400	7.7	0.029	na	8.1	1.4
	11/21/02	<b>0.86</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/20/03	<b>0.62</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/21/03	<b>0.52</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/21/03	<b>0.89</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	11/26/03	<b>0.86</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
B&C	3/3/04	<b>0.55</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/17/06	<b>0.66</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	2/14/07	<b>0.34</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	9/24/07	<b>0.69</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	3/13/08	<b>0.33</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	0.33	(0.20)	(0.20)
	9/26/08	<b>0.67</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.21</b>
	9/24/09	<b>0.60</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/12/10	<b>0.28</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	11/18/10	<b>0.22</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	5/19/11	<b>0.29</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	0.25	(0.20)	(0.20)
	11/22/11	<b>0.43</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.22</b>
	5/24/12	<b>0.27</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	<b>0.20</b>
	11/8/12	<b>0.44</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
	8/4/21	<b>0.33</b>	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)

<sup>a</sup> Model Toxics Control Act (MTCA) Cleanup Regulation (Ecology 2007).

<sup>b</sup> Cleanup Levels and Risk Calculations (CLARC) under the Model Toxics Control Act Cleanup Regulation (Ecology 2021).

Bold values were detected above the reporting limit.

Shaded values indicate the constituent was detected above the established MTCA Method A CUL, or Method B ground water CUL (if no Method A CUL is established).

PCE = perchloroethylene; TCE = trichloroethylene; cis DCE = (cis) 1,2-dichloroethene; trans DCE = (trans) 1,2-dichloroethene; 1,1-DCE = 1,1-dichloroethene;

1,1-DCA = 1,1-dichloroethane; 1,4-DCB = 1,4-dichlorobenzene; 1,3-DCB = 1,3-dichlorobenzene.

(0.20) Analyte was not detected above the enclosed practical quantitation limit indicated.

na Established ground water CUL for this constituent is not available.

Sources: Herrera (2012); B&C (2004b).

## Ground Water Analytical Results

Concentrations of nearly all COCs have decreased significantly in groundwater samples compared to 2012. The concentration of PCE detected in well MW-2d is nearly identical to the concentration detected in 2012 and remains below the MTCA Method A CUL. Only one COC, vinyl chloride, was detected above the MTCA Method A and B ground water CULs in well MW-1s. This is typical for sites with legacy PCE contamination.

## CONCLUSIONS

A general decreasing trend of PCE in all six wells indicates biodegradation is ongoing, and concentrations of nearly all COCs except vinyl chloride have dropped below the respective MTCA Method A or B CULs. RPAI should consider performing another limited bioremediation treatment at wells MW-1s, MW-1m, and MW-1d to accelerate the reduction in concentrations of vinyl chloride in ground water. Herrera will research options and discuss them with RPAI separately from this report. One option may be to resample the same onsite wells approximately one year after the treatment and see if concentrations of all COCs are below CULs. Then three additional quarterly ground water monitoring events should be completed to provide a minimum of one full year of monitoring data to Ecology. At that time, RPAI could submit an application to enter Ecology's Voluntary Cleanup Program (VCP) with the goal of obtaining No Further Action (NFA) status for the site.

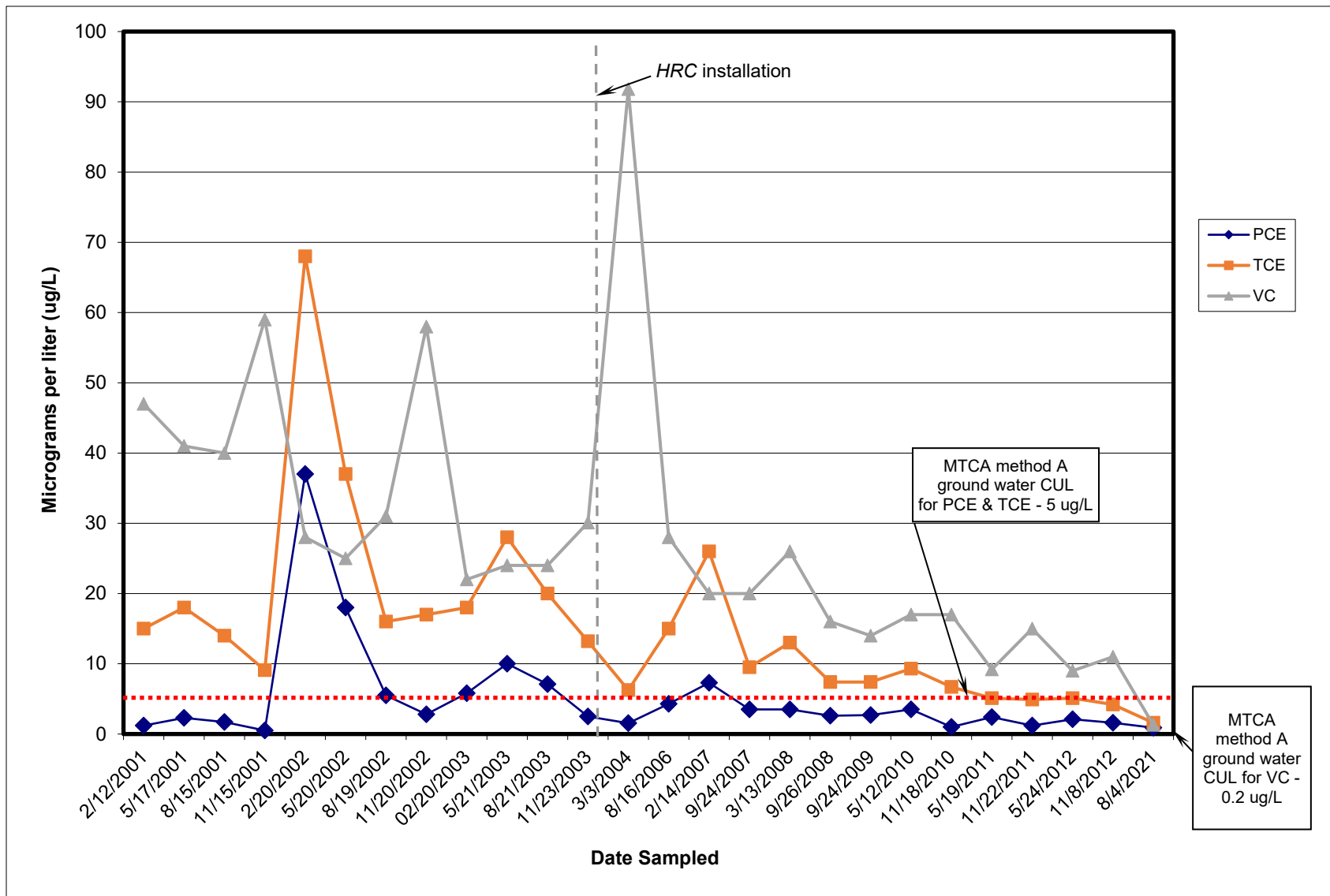


Figure 2. HVOC Concentrations in Ground Water (µg/L) at MW-1s, Lakewood Towne Center, Lakewood, Washington.

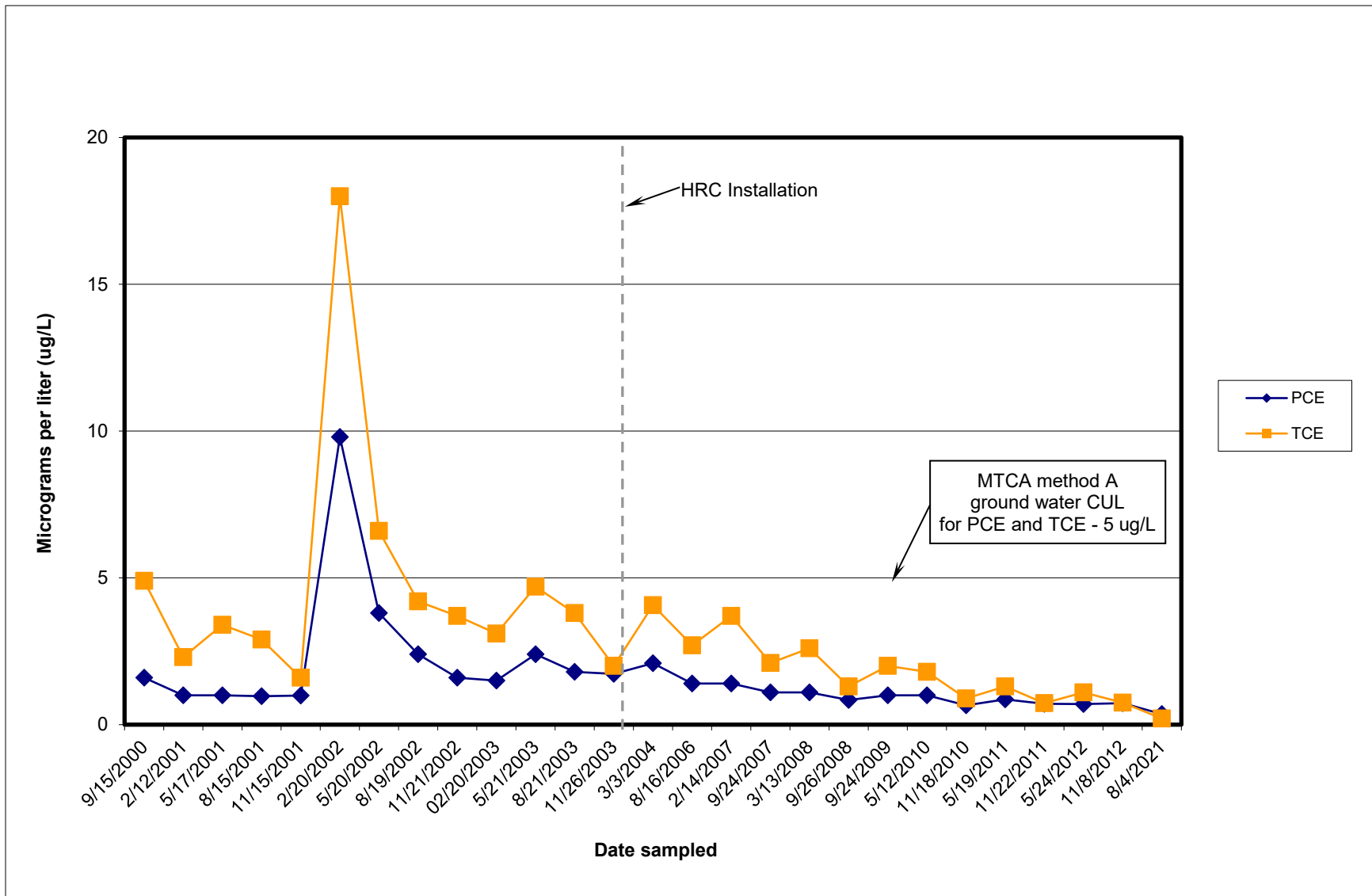


Figure 3. HVOC Concentrations in Ground Water (µg/L) at MW-4, Lakewood Towne Center, Lakewood, Washington.



## REFERENCES

Benner Stange Associates. 2001. Development Site Map of Lakewood Towne Center. Map produced by Benner Stange Associates, Architects of Lake Oswego, Oregon, for MBK Northwest, Inc. (Tony Nastansky, Lakewood Towne Center Management, provided a copy of the map to Herrera Environmental Consultants, Inc., Seattle, Washington, during the January 28, 2002, site visit.)

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## **ATTACHMENT A**

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# **Laboratory Analytical Report and Data Quality Assurance Review Summary**





14648 NE 95<sup>th</sup> Street, Redmond, WA 98052 • (425) 883-3881

August 9, 2021

George Iftner  
Herrera Environmental Consultants, Inc.  
2200 6th Avenue, Suite 1100  
Seattle, WA 98121

Re: Analytical Data for Project 21-07668-000  
Laboratory Reference No. 2108-053

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on August 5, 2021.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "DB", with a long horizontal flourish extending to the right.

David Baumeister  
Project Manager

Enclosures



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OnSite Environmental, Inc. 14648 NE 95<sup>th</sup> Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 9, 2021  
Samples Submitted: August 5, 2021  
Laboratory Reference: 2108-053  
Project: 21-07668-000

### Case Narrative

Samples were collected on August 4, 2021 and received by the laboratory on August 4, 2021. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: August 9, 2021  
 Samples Submitted: August 5, 2021  
 Laboratory Reference: 2108-053  
 Project: 21-07668-000

**VOLATILE ORGANICS EPA 8260D**  
 page 1 of 2

Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-5</b>					
Laboratory ID:	08-053-01					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



Date of Report: August 9, 2021  
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**VOLATILE ORGANICS EPA 8260D**  
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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-5</b>					
Laboratory ID:	08-053-01					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	0.33	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>99</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>99</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>97</i>	<i>78-125</i>				



Date of Report: August 9, 2021  
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**VOLATILE ORGANICS EPA 8260D**  
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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-4</b>					
Laboratory ID:	08-053-02					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	0.33	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	0.21	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



Date of Report: August 9, 2021  
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**VOLATILE ORGANICS EPA 8260D**  
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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-4</b>					
Laboratory ID:	08-053-02					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	0.36	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>100</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>100</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>97</i>	<i>78-125</i>				



Date of Report: August 9, 2021  
 Samples Submitted: August 5, 2021  
 Laboratory Reference: 2108-053  
 Project: 21-07668-000

**VOLATILE ORGANICS EPA 8260D**  
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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-1S</b>					
Laboratory ID:	08-053-03					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	1.3	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	3.3	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	1.6	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



Date of Report: August 9, 2021  
 Samples Submitted: August 5, 2021  
 Laboratory Reference: 2108-053  
 Project: 21-07668-000

**VOLATILE ORGANICS EPA 8260D**  
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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-1S</b>					
Laboratory ID:	08-053-03					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	0.90	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>101</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>100</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>97</i>	<i>78-125</i>				



Date of Report: August 9, 2021  
 Samples Submitted: August 5, 2021  
 Laboratory Reference: 2108-053  
 Project: 21-07668-000

**VOLATILE ORGANICS EPA 8260D**  
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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-1M</b>					
Laboratory ID:	08-053-04					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	0.20	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-1M</b>					
Laboratory ID:	08-053-04					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	0.32	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>101</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>101</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>98</i>	<i>78-125</i>				



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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-1D</b>					
Laboratory ID:	08-053-05					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-1D</b>					
Laboratory ID:	08-053-05					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>98</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>99</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>96</i>	<i>78-125</i>				



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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-2D</b>					
Laboratory ID:	08-053-06					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-2D</b>					
Laboratory ID:	08-053-06					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	0.54	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>99</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>100</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>98</i>	<i>78-125</i>				



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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>MW-Dup</b>					
Laboratory ID:	08-053-07					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>MW-Dup</b>					
Laboratory ID:	08-053-07					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	0.34	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>100</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>100</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>96</i>	<i>78-125</i>				



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Matrix: Water  
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>Client ID:</b>	<b>Trip Blank</b>					
Laboratory ID:	08-053-08					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



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<b>Analyte</b>	<b>Result</b>	<b>PQL</b>	<b>Method</b>	<b>Date Prepared</b>	<b>Date Analyzed</b>	<b>Flags</b>
<b>Client ID:</b>	<b>Trip Blank</b>					
Laboratory ID:	08-053-08					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>99</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>99</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>97</i>	<i>78-125</i>				



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 QUALITY CONTROL**

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Matrix: Water

Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>METHOD BLANK</b>						
Laboratory ID:	MB0806W1					
Dichlorodifluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloromethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Vinyl Chloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroethane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Iodomethane	ND	1.3	EPA 8260D	8-6-21	8-6-21	
Methylene Chloride	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chloroform	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Trichloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromomethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromodichloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260D	8-6-21	8-6-21	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-6-21	8-6-21	



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Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<b>METHOD BLANK</b>						
Laboratory ID:	MB0806W1					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Tetrachloroethene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Dibromochloromethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Chlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Bromoform	ND	1.0	EPA 8260D	8-6-21	8-6-21	
Bromobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-6-21	8-6-21	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-6-21	8-6-21	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-6-21	8-6-21	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>99</i>	<i>75-127</i>				
<i>Toluene-d8</i>	<i>99</i>	<i>80-127</i>				
<i>4-Bromofluorobenzene</i>	<i>97</i>	<i>78-125</i>				



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**VOLATILE ORGANICS EPA 8260D  
 QUALITY CONTROL**

Matrix: Water  
 Units: ug/L

Analyte	Result		Spike Level		Percent Recovery		Recovery	RPD	RPD	Flags
					Recovery	Limits	RPD	Limit		
<b>SPIKE BLANKS</b>										
Laboratory ID:	SB0806W1									
	SB	SBD	SB	SBD	SB	SBD				
1,1-Dichloroethene	9.59	9.22	10.0	10.0	96	92	78-124	4	19	
Benzene	9.30	8.98	10.0	10.0	93	90	80-119	4	16	
Trichloroethene	9.79	9.45	10.0	10.0	98	95	80-121	4	18	
Toluene	8.81	8.45	10.0	10.0	88	85	80-117	4	18	
Chlorobenzene	9.45	9.04	10.0	10.0	95	90	80-117	4	17	
<i>Surrogate:</i>										
Dibromofluoromethane					98	99	75-127			
Toluene-d8					100	100	80-127			
4-Bromofluorobenzene					100	101	78-125			





### Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
  - B - The analyte indicated was also found in the blank sample.
  - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
  - E - The value reported exceeds the quantitation range and is an estimate.
  - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
  - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
  - I - Compound recovery is outside of the control limits.
  - J - The value reported was below the practical quantitation limit. The value is an estimate.
  - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
  - L - The RPD is outside of the control limits.
  - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
  - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
  - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
  - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
  - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
  - P - The RPD of the detected concentrations between the two columns is greater than 40.
  - Q - Surrogate recovery is outside of the control limits.
  - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
  - T - The sample chromatogram is not similar to a typical \_\_\_\_\_.
  - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
  - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
  - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
  - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
  - X - Sample extract treated with a mercury cleanup procedure.
  - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
  - Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
  - Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.
  - Z -
- ND - Not Detected at PQL  
 PQL - Practical Quantitation Limit  
 RPD - Relative Percent Difference







# TECHNICAL MEMORANDUM

**Date:** August 18, 2021  
**To:** Project File 21-07668-000  
**From:** Gina Catarra  
**Subject:** Data Quality Assurance Review of the Lakewood Towne Center Groundwater Monitoring

This memorandum presents a review of data quality for 8 groundwater samples (including one field duplicate and one trip blank sample) collected from the Lakewood Towne Center site in Lakewood, Washington on August 4, 2021. OnSite Environmental, Inc. (OnSite), of Redmond, Washington analyzed the samples for:

- Halogenated volatile organic compounds (HVOCs) by EPA method 8260B.

Results for the following samples were validated.

Sample ID	Lab Ref. No.	Date Collected	Analyses
MW-5	2108-053	8/04/21	HVOCs
MW-4	2108-053	8/04/21	HVOCs
MW-15	2108-053	8/04/21	HVOCs
MW-1M	2108-053	8/04/21	HVOCs
MW-1D	2108-053	8/04/21	HVOCs
MW-2D	2108-053	8/04/21	HVOCs
MW-Dup <sup>a</sup>	2108-053	8/04/21	HVOCs
Trip Blank	2108-053	--	HVOCs

<sup>a</sup> Field duplicate of sample MW-5

The laboratory's performance was reviewed in accordance with quality control specifications outlined by the analytical method and with laboratory quality control limits.

Quality control data summaries submitted by the laboratory were reviewed; raw data were not submitted by the laboratory. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by definitions of data qualifiers.



## **Custody, Preservation, Holding Times, and Completeness—Acceptable**

The samples were properly preserved and sample custody was maintained from sample collection to receipt at the laboratory. Samples were analyzed within the required method holding times. The laboratory reports were complete and contained results for all samples and tests requested on the chain-of-custody (COC) forms.

## **Laboratory Reporting Limits—Acceptable**

The laboratory reporting limits were reasonable for the specified methods and were below relevant comparison criteria. No data were qualified based on laboratory reporting limits.

## **Method Blank Analysis—Acceptable**

Method blanks were analyzed at the required frequency. The method blank did not contain levels of target analytes above the laboratory reporting limits.

## **Laboratory Control Sample Analysis—Acceptable**

A spike blank sample was analyzed for HVOCs at the required frequency. All spike blank percent recoveries (ranging from 85 to 98 percent) met the control limits specified by the laboratory (ranging from 78 to 124 percent).

## **Surrogate Spike Analysis—Acceptable**

Three surrogate compounds were added to all samples and laboratory QC samples for HVOCs analysis. All surrogate percent recoveries (ranging from 96 to 101 percent) met the control limits specified by the laboratory (75 to 127 percent).

## **Laboratory Duplicate Analysis—Acceptable**

A spike blank/spike blank duplicate sample was analyzed for HVOCs at the required frequency. The relative percent difference (RPD) values (4 percent) met the control limits established by the laboratory (ranging from less than 16 to 19 percent).

## **Field Duplicate Analysis—Acceptable**

A field duplicate sample of MW-5 was collected and analyzed for HVOCs at the required frequency. The relative percent difference (RPD) was calculated for each analyte where both duplicate values were greater than five times the reporting limit (RL). The difference between

duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the duplicate. The difference value for TCE (0.01) was less than the reporting limit (0.20), and no data were qualified.

## DEFINITION OF DATA QUALIFIERS

The following are data qualifier definitions applied for this project.

Data Qualifier	Definition
J	Value is an estimate based on analytical results
R	Value is rejected based on analytical results
U	Value is below the reporting limit
UJ	Value is below the reporting limit and is an estimate based on analytical results



## **ATTACHMENT B**

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### **Ground Water Sampling Field Notes**















8/4/2021 Lakewood Towne Center

George Eftner,

06:40 left Seattle

07:30 onsite. Sunny. Dry. High upper 70s  
located wells 1s, 1m, 1d.

Water levels	SWL	Time	Total Depth
MW-1S	12.12	07:45	15.05
MW-1M	12.22	07:48	24.73
MW-1D	12.34	07:50	47.8'
MW-2D	10.79	08:05	57.4'
MW-3	17.56	10:26	27.83'
MW-4	13.66	8:35	16.35
MW-5	13:30	08:29	16.08
<del>MW-5</del>			

10:55 start purge MW-5

11:20 Sample MW-5

9:30 MW-Dup of MW-5

\* All wells locked caps over PVC, steel monument lids missing bolts, protective covers over monuments ✓ Either steel "cleanout" lid or Irrigation round box.

8/4/21 Lakewood DC ...

11:25 start purge MW-4

11:50 Sample MW-4.

12:04 start purge MW-1Shallow

12:30 Sampled MW-1S

12:40 start purge MW-1M

13:06 collected sample

13:12 start purge MW-1D

13:40 collected sample

13:57 start purge MW-2D

14:20 collected sample

14:40 Dropped off 30-gallon drum with  
purge water in storage room behind  
old Country Buffet  
- checked in with Krystal Peltzer  
then left the site.

