

# TECHNICAL MEMORANDUM

---

**To:** Nevada Environmental Response Trust

---

**Cc:** Nevada Division of Environmental Protection  
United States Environmental Protection Agency

---

**From:** Chris Hayes and Dana Grady

---

**Date:** June 7, 2023

---

**Subject:** Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report

---

At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum to summarize Tetra Tech's progress during April 2023 toward successfully implementing the Unit 4 Source Area In-Situ Bioremediation (ISB) Treatability Study.

## Task Progress Update: April 2023

### Task M21 – Unit 4 Source Area ISB Treatability Study

- Current Status –

Phase 2 of the Unit 4 Source Area ISB Treatability Study is ongoing. A layout map and construction details of all injection, monitoring, and extraction wells are provided on Figure 1 and in Table 1, respectively. Operations, maintenance, and monitoring activities completed during April 2023 are summarized below.

- Operations and Maintenance

- Area 1 –The first phase of the treatability study for Area 1 consisted of a total dissolved solids (TDS) reduction period prior to the injection of a carbon substrate due to the presence of extremely elevated TDS concentrations in groundwater in the Area 1 deep zone. This phase included the injection of clean water (formerly known as stabilized Lake Mead water [SLMW]) in a pulsed manner and continuous groundwater extraction to reduce TDS concentrations to levels that will allow biodegradation processes to proceed (i.e., TDS concentrations to below 21,000 milligrams per liter [mg/L]) prior to carbon substrate/water injections). The TDS reduction period began on September 8, 2022 in the Area 1 deep zone. Once TDS concentrations were below the TDS goal of 21,000 mg/L for three consecutive events, a baseline groundwater sampling event was performed in March 2023, followed by the start-up of carbon injections into Area 1 intermediate and deep zones on April 6, 2023.

The ISB injection process into Area 1 consists of daily-pulsed injections of a carbon substrate solution, followed by daily injections of anaerobic distribution water (clean water amended with Vitamin C). The carbon substrate solution currently consists of 0.5 percent

molasses solution, 0.5 molar sodium bicarbonate solution, trace mineral solution, and vitamin B12. The carbon substrate solution also contains filtered biosolids collected from the on-site fluidized bed reactors, which will continue for approximately 90 days. The macronutrient solution consisting of urea and diammonium phosphate is not currently being added to the injectate solution to minimize precipitate formation. This macronutrient may be added in the future if required based on effectiveness monitoring results. Summaries of Area 1 extractions and injections are provided in Tables 2 and 3, respectively. Specific details of ongoing operations in April 2023 include the following:

- A total of 134,132 gallons of groundwater was extracted from two extraction wells screened within Area 1 intermediate zone while approximately 23,990 gallons of carbon solution and 18,110 gallons of distribution water were injected into two injection wells.
- Approximately 24,591 gallons of groundwater were extracted from one extraction well screened within the Area 1 deep zone, while approximately 14,642 gallons of carbon solution and 22,608 gallons of distribution water were injected into four Area 1 deep injection wells.
- Area 2 – Because TDS concentrations in Area 2 are lower than Area 1 and averaged approximately 19,500 mg/L during baseline sampling, ISB injection/extraction activities are being implemented without an initial TDS reduction step. Carbon substrate solution/water injection and groundwater extraction operations in both the intermediate and deep zones within Area 2 began on September 13, 2022 and are ongoing. The injection process consists of daily-pulsed injections of a carbon substrate solution, followed by daily injections of anaerobic distribution water (clean water amended with Vitamin C). The carbon substrate solution currently consists of 0.5 percent molasses solution, 0.5 molar sodium bicarbonate solution, trace mineral solution, and vitamin B12. The carbon substrate solution also initially contained filtered biosolids collected from the on-site fluidized bed reactors. The addition of the biosolids in the carbon substrate solution was discontinued on December 15, 2022 following completion of the first 90 days of system operation (in accordance with the NDEP-approved Unit 4 Source Area ISB Treatability Study Work Plan Addendum). As discussed above, the macronutrient solution consisting of urea and diammonium phosphate is not currently being added to the injectate solution to minimize precipitate formation. This macronutrient may be added in the future if required based on effectiveness monitoring results. Summaries of Area 2 extractions and injections are provided in Tables 2 and 4, respectively. Specific details of ongoing operations during April 2023 include the following:
  - Area 2 Intermediate Zone – Approximately 10,425 gallons of groundwater were extracted from two extraction wells, while approximately 14,772 gallons of carbon solution and 10,928 gallons of distribution water were injected into two injection wells.
  - Area 2 Deep Zone – Approximately 13,005 gallons of groundwater were extracted from one extraction well, while approximately 29,206 gallons of carbon solution and 21,935 gallons of distribution water were injected into four injection wells.
  - Due to decreasing extraction rates in the Area 2 intermediate extraction wells (U4-E-06I and U4-E-07I), well maintenance was performed in both extraction wells on April 11 through April 13, 2023 in an effort to improve extraction rates. Well maintenance activities were performed using hydrojetting techniques with the addition of well maintenance chemicals in accordance with the Underground

Injection Control (UIC) Permit Modification approved by the Bureau of Water Pollution Control on March 15, 2023.

- Unit 4 system operations in both Areas 1 and 2 were temporarily shut down on April 3, 2023 for tank cleanout activities and to prepare for Area 1 carbon injections. Additionally, injection and extraction operations were temporarily suspended during well maintenance activities.
- Effectiveness Monitoring – The effectiveness monitoring program included a baseline groundwater sampling event completed in April 2022 prior to system start-up. Following start-up in early September 2022, the effectiveness monitoring program was implemented in accordance with the Work Plan Addendum. During the first month of operations, one biweekly sampling event of Area 2 monitoring wells was conducted in September 2022. The monitoring program shifted to monthly sampling in October 2022 and is ongoing for both Areas 1 and 2.
  - In March 2023, groundwater samples were collected from all Area 1 intermediate and deep injection, extraction, and monitoring wells to establish baseline conditions prior to the startup of carbon injections in Area 1. Additionally, groundwater samples were collected from monitoring wells in Area 2 in March 2023 as part of the on-going effectiveness monitoring program. Available draft groundwater analytical results from the baseline sampling event and subsequent monitoring events performed from September 2022 to February 2023 are presented in Table 5 and have been summarized in previous monthly progress reports. Transmittal of the March 2023 data was delayed due to laboratory issues with the electronic data deliverables, which were identified and subsequently corrected. Data from the March 2023 sampling event will be summarized in the May 2023 progress report once final reporting is available from the analytical laboratory.
  - In April 2023, groundwater sampling activities were performed in both Area 1 and Area 2 monitoring wells from April 17 through April 21, 2023. Data from the April 2023 sampling event will be summarized in future monthly progress reports once final reporting is available from the analytical laboratory.
- Schedule and Progress Updates
  - Area 1 ISB operations are anticipated to continue through April 2024.
  - Area 2 ISB operations are anticipated to continue through September 2023.
- Health and Safety
  - There were no health and safety incidents related to Task M21 in April 2023.

## CERTIFICATION

---

### Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report


**Nevada Environmental Response Trust Site  
(Former Tronox LLC Site)  
Henderson, Nevada**

#### **Nevada Environmental Response Trust (NERT) Representative Certification**

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Signature:**  <sup>Not Individually, but Solely  
as President of the Trustee</sup>, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Name:** Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Title:** Solely as President and not individually

**Company:** Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

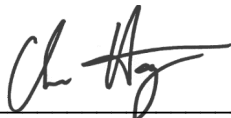
**Date:**                     6/9/23

## CERTIFICATION

---

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

**Description of Services Provided:** Prepared Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report.



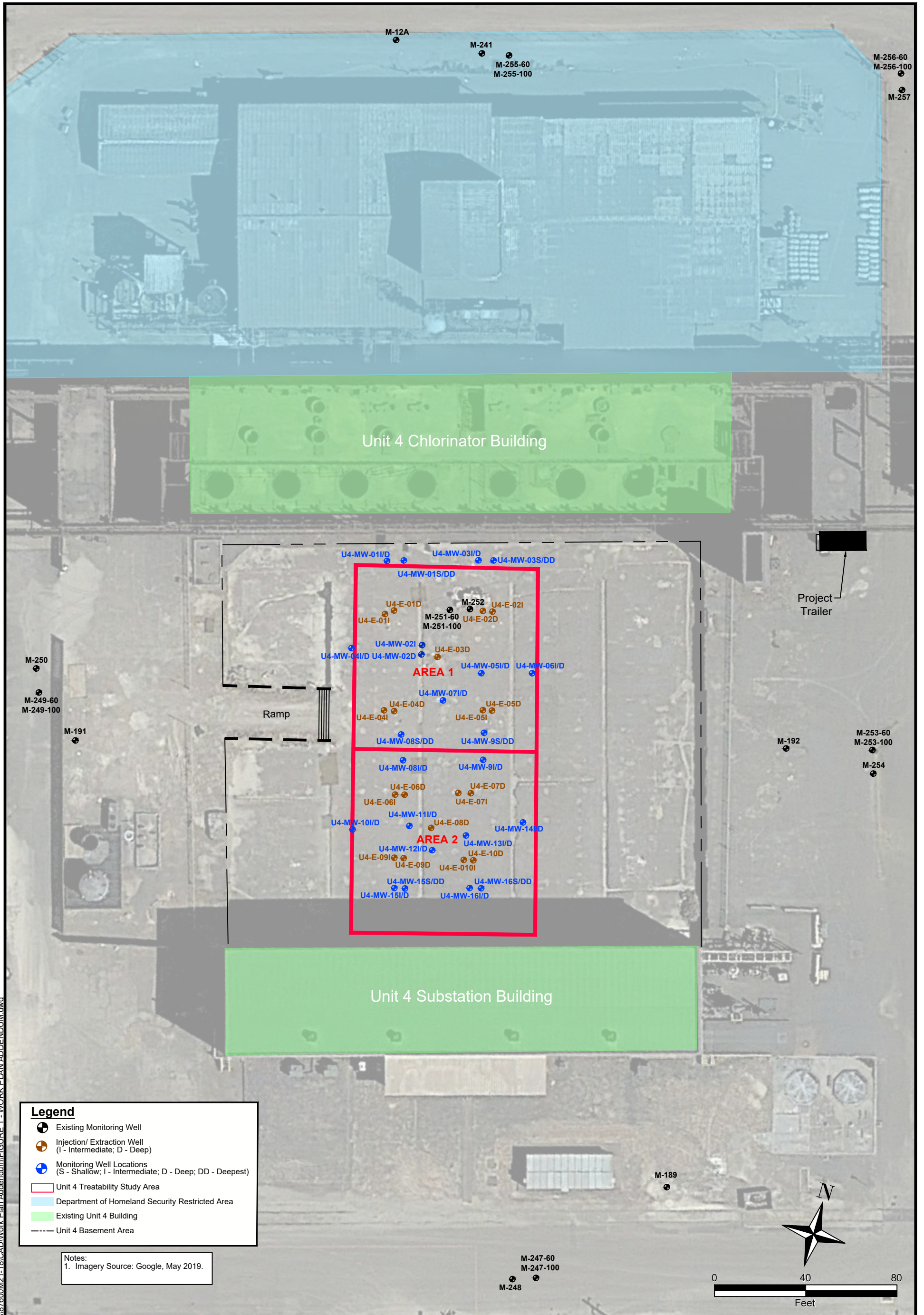
\_\_\_\_\_  
**Christopher Hayes, CEM**  
Environmental Engineer  
Tetra Tech, Inc.

\_\_\_\_\_  
June 7, 2023

Date

Nevada CEM Certificate Number: EM2499  
Nevada CEM Expiration Date: December 15, 2024

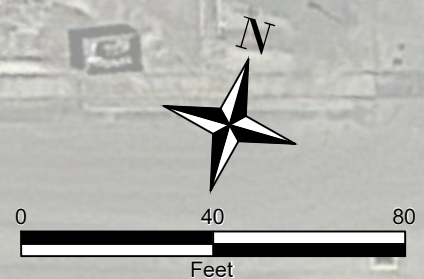
## Figures



**Legend**

- Existing Monitoring Well
- ⊕ Injection/ Extraction Well (I - Intermediate; D - Deep)
- ⊕ Monitoring Well Locations (S - Shallow; I - Intermediate; D - Deep; DD - Deepest)
- ▭ Unit 4 Treatability Study Area
- ▭ Department of Homeland Security Restricted Area
- ▭ Existing Unit 4 Building
- Unit 4 Basement Area

Notes:  
1. Imagery Source: Google, May 2019.



\\its318fs3.tl.local\CES\Projects\87600\M21-18\CAD\Work Plan Addendum\FIGURE 1 - WORK PLAN ADDENDUM.dwg

NEVADA ENVIRONMENTAL RESPONSE TRUST SITE

UNIT 4 SOURCE AREA IN-SITU BIOREMEDIATION TREATABILITY STUDY  
HENDERSON, NEVADA

INJECTION/ EXTRACTION AND MONITORING WELL LAYOUT

**TETRA TECH**

www.tetrattech.com  
150 S. 4th Street, Unit A  
Henderson, Nevada 89015  
Phone: (702) 854-2293

Project No.:	117-7502021-M21
Date:	May 10, 2022
Designed By:	AC
Figure No.:	<b>1</b>

## Tables





Table 2  
Summary of Groundwater Extraction Activities - April 2023  
Unit 4 Source Area Bioremediation Treatability Study

Study Area		Duration - Area 1 Intermediate	Area 1 Intermediate						Duration - Area 1 and Area 2 Deep	Area 1 Deep			Area 2 Deep			Duration - Area 2 Intermediate	Area 2 Intermediate					
Well ID			U4-E-011			U4-E-021				U4-E-03D			U4-E-08D				U4-E-061			U4-E-071		
Date	Time		Average Flow Rate	Volume Extracted	Cumulative Total Volume	Average Flow Rate	Volume Extracted	Cumulative Total Volume		Average Flow Rate	Volume Extracted	Cumulative Total Volume	Average Flow Rate	Volume Extracted	Cumulative Total Volume		Average Flow Rate	Volume Extracted	Cumulative Total Volume	Average Flow Rate	Volume Extracted	Cumulative Total Volume
			minutes	gpm	gallons	gallons	gpm	gallons		gallons	minutes	gpm	gallons	gallons	gpm		gallons	gallons	minutes	gpm	gallons	gallons
4/1/2023	15:06	--	--	--	--	--	--	1442	0.7	1,057.89	178,886.77	0.4	536.37	93,119.06	596	--	--	98,918.28	0.2	120.62	48,386.74	
4/2/2023	14:23	--	--	--	--	--	--	1397	0.7	1,013.99	179,900.76	0.4	522.97	93,642.03	554	--	--	98,918.28	0.2	102.07	48,488.81	
4/3/2023	--	--	--	--	--	--	--	--	--	--	179,900.76	--	--	93,642.03	--	--	--	98,918.28	--	--	48,488.81	
4/4/2023	15:18	--	--	--	--	--	--	610	0.8	479.35	180,380.11	0.4	237.10	93,879.13	595	--	--	98,918.28	0.2	127.87	48,616.68	
4/5/2023	15:13	--	--	--	--	--	--	1435	0.7	1,076.19	181,456.30	0.4	525.91	94,405.04	602	--	--	98,918.28	0.2	124.66	48,741.34	
4/6/2023	17:04	640	2.5	1590.12	1,590.12	2.7	1750.82	1,750.82	1551	0.7	1,155.47	182,611.77	0.4	572.64	94,977.68	712	--	--	98,918.28	0.2	146.96	48,888.30
4/7/2023	17:01	1,437	2.6	3703.61	5,293.73	2.4	3391.05	5,141.87	1437	0.7	1,070.29	183,682.06	0.4	554.42	95,532.10	712	--	--	98,918.28	0.2	138.52	49,026.82
4/8/2023	17:06	1,445	2.4	3419.66	8,713.39	2.6	3728.75	8,870.62	1445	0.7	1,072.19	184,754.25	0.4	562.07	96,094.17	720	--	--	98,918.28	0.2	127.22	49,154.04
4/9/2023	17:09	1,443	2.5	3611.82	12,325.21	2.4	3498.80	12,369.42	1443	0.7	1,060.65	185,814.90	0.4	560.22	96,654.39	723	--	--	98,918.28	0.2	126.28	49,280.32
4/10/2023	17:05	1,436	2.4	3469.70	15,794.91	2.3	3357.50	15,726.92	1436	0.7	1,026.55	186,841.45	0.4	554.06	97,208.45	1,441	--	--	98,918.28	0.1	124.47	49,404.79
4/11/2023	5:10	725	2.4	1768.85	17,563.76	2.6	1909.37	17,636.29	725	0.7	510.95	187,352.40	--	--	97,208.45	--	--	--	98,918.28	--	--	49,404.79
4/12/2023	--	--	--	--	17,563.76	--	--	17,636.29	--	--	--	187,352.40	--	--	97,208.45	--	--	--	98,918.28	--	--	49,404.79
4/13/2023	--	--	--	--	17,563.76	--	--	17,636.29	--	--	--	187,352.40	--	--	97,208.45	--	--	--	98,918.28	--	--	49,404.79
4/14/2023	15:18	469	2.3	1095.67	18,659.43	2.4	1117.05	18,753.34	469	0.7	332.44	187,684.84	0.9	438.38	97,646.83	469	0.9	436.23	99,354.51	0.8	382.41	49,787.20
4/15/2023	14:59	1,421	2.3	3254.58	21,914.01	2.3	3330.46	22,083.80	1421	0.6	921.00	188,605.84	0.4	514.07	98,160.90	1,421	--	--	99,354.51	0.3	388.22	50,175.42
4/16/2023	14:59	1,440	2.3	3329.52	25,243.53	2.3	3379.45	25,463.25	1440	0.6	926.44	189,532.28	0.4	591.48	98,752.38	1,440	--	--	99,354.51	0.3	365.55	50,540.97
4/17/2023	15:00	1,441	2.5	3580.97	28,824.50	2.5	3533.59	28,996.84	1441	0.7	975.53	190,507.81	0.4	571.59	99,323.97	1,441	--	--	99,354.51	0.3	386.98	50,927.95
4/18/2023	15:05	1,445	2.4	3513.45	32,337.95	2.3	3322.45	32,319.29	1445	0.6	914.60	191,422.41	0.4	540.90	99,864.87	1,445	--	--	99,354.51	0.2	355.04	51,282.99
4/19/2023	15:02	1,437	2.4	3424.91	35,762.86	2.2	3126.09	35,445.38	1437	0.6	897.90	192,320.31	0.4	506.45	100,371.32	1,437	--	--	99,354.51	0.2	285.45	51,568.44
4/20/2023	15:01	1,439	2.3	3298.13	39,060.99	2.1	3028.73	38,474.11	1439	0.6	898.15	193,218.46	0.4	514.96	100,886.28	1,439	--	--	99,354.51	0.2	321.45	51,889.89
4/21/2023	15:04	1,443	2.2	3172.21	42,233.20	2.1	3085.74	41,559.85	1443	0.6	928.96	194,147.42	0.3	499.87	101,386.15	1,443	0.6	810.18	100,164.69	0.2	294.10	52,183.99
4/22/2023	15:00	1,436	2.0	2926.31	45,159.51	2.0	2906.77	44,466.62	1436	0.6	898.38	195,045.80	0.3	499.06	101,885.21	1,436	0.5	682.38	100,847.07	0.2	286.53	52,470.52
4/23/2023	15:06	1,446	1.8	2648.88	47,808.39	1.9	2817.68	47,284.30	1446	0.6	900.60	195,946.40	0.3	488.31	102,373.52	1,446	0.5	676.53	101,523.60	0.2	246.08	52,716.60
4/24/2023	15:04	1,438	1.9	2785.20	50,593.59	2.0	2835.36	50,119.66	1438	0.7	953.60	196,900.00	0.4	504.57	102,878.09	1,438	0.5	691.25	102,214.85	0.2	259.69	52,976.29
4/25/2023	15:07	1,443	2.4	3411.95	54,005.54	2.0	2937.18	53,056.84	1443	0.7	1,062.28	197,962.28	0.3	503.46	103,381.55	596	1.2	709.29	102,924.14	0.2	128.43	53,104.72
4/26/2023	14:19	1,392	2.2	3100.93	57,106.47	2.0	2732.24	55,789.08	1392	0.7	992.83	198,955.11	0.3	481.94	103,863.49	550	0.4	223.05	103,147.19	0.2	121.65	53,226.37
4/27/2023	15:19	1,500	2.0	3021.52	60,127.99	1.8	2757.40	58,546.48	1500	0.6	865.47	199,820.58	0.3	397.98	104,261.47	605	0.4	258.38	103,405.57	0.2	115.95	53,342.32
4/28/2023	15:11	1,432	2.0	2851.15	62,979.14	1.9	2660.79	61,207.27	1432	0.6	889.42	200,710.00	0.3	437.29	104,698.76	603	0.2	137.05	103,542.62	0.2	118.18	53,460.50
4/29/2023	15:07	1,436	1.8	2559.87	65,539.01	1.8	2600.43	63,807.70	1436	0.6	856.68	201,566.68	0.3	439.50	105,138.26	593	0.3	201.84	103,744.46	0.2	115.63	53,576.13
4/30/2023	15:10	1,443	1.6	2265.71	67,804.72	1.7	2519.59	66,327.29	1443	0.6	852.98	202,419.66	0.3	449.53	105,587.79	599	0.3	173.63	103,918.09	0.2	114.69	53,690.82
<b>April 2023 Total</b>			<b>67,805</b>			<b>66,327</b>			<b>24,591</b>			<b>13,005</b>			<b>5,000</b>			<b>5,425</b>				
<b>Cumulative Total</b>			<b>67,805</b>			<b>66,327</b>			<b>202,420</b>			<b>105,588</b>			<b>103,918</b>			<b>53,691</b>				

Notes:

gpm - gallons per minute

1. Operations were temporarily suspended on April 3, 2023 due to tank maintenance activities and to prepare the system for Area 1 carbon substrate injection activities to commence on April 6, 2023. Operations were also temporarily suspended April 11 to April 13, 2023 due to well maintenance activities.
2. Extraction operations are active 24 hours per day. Volume and duration quantities represent gallons or minutes of extraction since previous record indicated. On January 18, 2023, Area 2 intermediate wells were transitioned from 24-hour operation to 12-hour operation in an effort to improve daily extraction rates. After well maintenance activities on April 11 to April 13, 2023, 24 hours per day extraction operations were temporarily resumed un April 25, 2023.
3. Pumping at U4-E-061 was temporarily suspended on March 18, 2023 due to reduced capacity of the extraction well. Well maintenance was performed April 11 to April 13, 2023. Extraction pump maintenance was performed at U4-E-061 was performed on April 16 to April 20, 2023 and regular operations resumed on April 21, 2023.

Table 3  
 Summary of Injection Activities  
 Area 1 - April 2023  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area			Area 1 Intermediate										Area 1 Deep															
Well ID			U4-E-04I				U4-E-05I						U4-E-01D				U4-E-02D				U4-E-04D				U4-E-05D			
Date	Injection Start Time	Injection Stop Time	Duration <sup>(1)</sup> minutes	Volume Carbon Solution Injected <sup>(2)</sup> gallons	Volume Distribution Water Solution Injected <sup>(3,4)</sup> gallons	Average Flow Rate gpm	Maximum Injection Pressure psi	Volume Carbon Solution Injected <sup>(2)</sup> gallons	Volume Distribution Water Solution Injected <sup>(3,4)</sup> gallons	Average Flow Rate gpm	Maximum Injection Pressure psi	Volume Carbon Solution Injected <sup>(2)</sup> gallons	Volume Distribution Water Solution Injected <sup>(3,4)</sup> gallons	Average Flow Rate gpm	Maximum Injection Pressure psi	Volume Carbon Solution Injected <sup>(2)</sup> gallons	Volume Distribution Water Solution Injected <sup>(3,4)</sup> gallons	Average Flow Rate gpm	Maximum Injection Pressure psi	Volume Carbon Solution Injected <sup>(2)</sup> gallons	Volume Distribution Water Solution Injected <sup>(3,4)</sup> gallons	Average Flow Rate gpm	Maximum Injection Pressure psi	Volume Carbon Solution Injected <sup>(2)</sup> gallons	Volume Distribution Water Solution Injected <sup>(3,4)</sup> gallons	Average Flow Rate gpm	Maximum Injection Pressure psi	
4/1/2023	5:31	13:57	462	--	--	--	--	--	--	--	--	--	704.05	1.5	20	--	732.07	1.6	30	--	707.21	1.5	22	--	715.50	1.5	27	
4/2/2023	5:31	14:14	479	--	--	--	--	--	--	--	--	--	731.22	1.5	19	--	737.56	1.5	30	--	732.74	1.5	20	--	743.73	1.6	26	
4/3/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
4/4/2023	5:31	13:59	487	--	--	--	--	--	--	--	--	--	716.81	1.5	22	--	715.29	1.5	30	--	697.04	1.4	21	--	719.27	1.5	27	
4/5/2023	5:31	14:05	470	--	--	--	--	--	--	--	--	--	726.42	1.5	22	--	738.81	1.6	30	--	728.56	1.6	20	--	717.38	1.5	27	
4/6/2023	5:30	16:23	500	538.21	383.20	1.8	11	532.05	400.71	1.9	8	136.30	106.10	0.5	18	97.88	77.75	0.4	12	218.31	159.45	0.8	16	222.75	164.29	0.8	18	
4/7/2023	5:30	16:20	504	536.64	400.57	1.9	10	532.43	405.56	1.9	10	135.31	93.71	0.5	15	106.96	69.62	0.4	15	214.83	164.63	0.8	16	217.40	161.04	0.8	17	
4/8/2023	5:30	16:12	495	551.11	393.37	1.9	12	550.63	395.41	1.9	14	126.80	91.21	0.4	16	90.46	70.64	0.3	14	210.25	153.35	0.7	17	226.48	163.33	0.8	17	
4/9/2023	5:30	16:17	500	542.79	404.39	1.9	12	542.85	405.84	1.9	19	97.78	81.64	0.4	18	93.20	73.08	0.3	14	220.87	157.69	0.8	18	220.66	174.45	0.8	18	
4/10/2023	5:30	16:14	496	541.31	400.57	1.9	16	543.26	397.46	1.9	22	132.63	105.37	0.5	18	100.78	63.37	0.3	14	220.70	159.67	0.8	18	221.51	159.89	0.8	20	
4/11/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
4/12/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
4/13/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
4/14/2023	6:00	14:52	489	513.16	389.86	1.8	19	519.52	402.03	1.9	20	107.43	102.12	0.4	19	89.42	71.98	0.3	17	201.77	161.65	0.7	19	208.96	158.61	0.8	21	
4/15/2023	5:15	14:21	493	549.17	414.25	2.0	20	541.40	411.50	1.9	18	131.61	106.98	0.5	18	92.26	71.82	0.3	18	209.19	165.84	0.8	18	220.90	164.56	0.8	20	
4/16/2023	5:15	14:19	500	550.87	405.32	1.9	19	542.84	416.72	1.9	16	131.26	103.36	0.5	18	91.55	65.11	0.3	18	213.58	164.19	0.8	18	219.18	166.69	0.8	22	
4/17/2023	5:15	14:32	509	566.13	414.32	1.9	17	554.03	414.39	1.9	17	124.21	89.02	0.4	16	107.39	63.41	0.3	19	211.22	169.08	0.7	17	225.73	163.56	0.8	24	
4/18/2023	5:15	14:27	505	542.13	411.75	1.9	17	535.21	418.16	1.9	18	115.62	102.63	0.4	17	94.67	67.52	0.3	20	203.70	162.04	0.7	18	233.72	165.09	0.8	25	
4/19/2023	5:15	14:26	499	559.21	430.96	2.0	16	520.98	410.43	1.9	19	126.14	103.39	0.5	19	84.98	72.12	0.3	21	233.76	173.15	0.8	18	216.23	172.57	0.8	26	
4/20/2023	5:15	14:28	503	539.23	413.64	1.9	14	544.12	434.52	1.9	18	148.69	118.01	0.5	19	93.56	66.01	0.3	19	214.29	162.34	0.7	18	225.62	165.65	0.8	26	
4/21/2023	5:15	14:32	508	551.21	418.51	1.9	13	525.83	412.00	1.8	17	126.86	73.44	0.4	18	95.71	75.05	0.3	19	219.64	161.16	0.7	17	228.11	171.72	0.8	26	
4/22/2023	5:15	14:27	504	552.22	423.72	1.9	12	552.10	421.25	1.9	17	114.30	73.04	0.4	18	94.55	70.17	0.3	19	209.41	171.24	0.8	17	231.61	172.78	0.8	26	
4/23/2023	5:27	14:42	512	547.05	424.25	1.9	12	537.31	414.90	1.9	17	121.65	51.59	0.3	18	94.38	65.95	0.3	17	224.04	171.90	0.8	17	230.20	174.17	0.8	26	
4/24/2023	5:15	14:28	508	557.95	406.31	1.9	11	557.05	418.49	1.9	16	97.09	105.43	0.4	19	87.32	66.42	0.3	17	210.27	158.18	0.7	17	232.86	164.52	0.8	24	
4/25/2023	5:15	14:22	501	537.38	407.74	1.9	11	555.49	403.03	1.9	17	141.53	105.97	0.5	19	89.58	69.06	0.3	18	213.40	163.08	0.8	18	228.99	166.84	0.8	26	
4/26/2023	5:15	14:13	492	543.56	391.32	1.9	11	546.08	412.77	1.9	17	155.67	112.29	0.5	18	85.63	74.83	0.3	18	216.64	159.86	0.8	17	229.88	172.55	0.8	25	
4/27/2023	5:15	14:35	510	548.38	414.10	1.9	11	556.21	423.90	1.9	15	148.03	116.43	0.5	17	86.79	62.26	0.3	13	213.21	157.50	0.7	17	220.43	174.43	0.8	24	
4/28/2023	5:15	14:39	516	543.17	431.30	1.9	10	546.48	434.73	1.9	16	162.63	125.21	0.6	18	101.01	80.69	0.4	18	233.12	169.63	0.8	17	235.99	180.00	0.8	25	
4/29/2023	5:15	14:37	514	559.44	417.29	1.9	9	559.52	429.07	1.9	15	139.89	112.69	0.5	17	96.43	82.82	0.3	18	212.70	166.54	0.7	17	235.59	175.26	0.8	25	
4/30/2023	5:15	14:31	509	568.84	410.54	1.9	9	555.28	419.67	1.9	15	140.29	109.23	0.5	16	93.58	79.98	0.3	19	214.35	160.82	0.7	18	239.67	171.21	0.8	24	
<b>April 2023 Total</b>				<b>12039.16</b>	<b>9,007.28</b>			<b>11950.67</b>	<b>9,102.54</b>			<b>2861.72</b>	<b>5,067.36</b>			<b>2068.09</b>	<b>4,483.39</b>			<b>4739.25</b>	<b>6,458.54</b>			<b>4972.47</b>	<b>6,599.09</b>			
<b>Cumulative Total</b>				<b>12039.16</b>	<b>9,007.28</b>			<b>11950.67</b>	<b>9,102.54</b>			<b>2861.72</b>	<b>138,621.26</b>			<b>2068.09</b>	<b>136,610.68</b>			<b>4739.25</b>	<b>139,070.85</b>			<b>4972.47</b>	<b>138,995.71</b>			

Notes:

- gpm - gallons per minute
- psi - pounds per square inch
1. Injection duration indicates the total minutes of active injection per day, accounting for any downtime in injections that may have occurred throughout the day. Therefore, injection duration may be less than the difference in daily injection start and stop times indicated.
2. Carbon substrate solution is batch mixed. Batches of carbon substrate solution includes the following components in solution with Stabilized Lake Mead Water (SLMW): 0.5% molasses, 0.25% filtered Fluidized Bed Reactor (FBR) sludge, 1.25% 0.5 Molar Sodium Bicarbonate Solution, 0.001% trace mineral solution, and 5 milligrams per liter Vitamin B12.
3. Distribution water solution is batch mixed. Batches of distribution water solution includes 0.0025 pounds of Vitamin C per gallon of Stabilized Lake Mead Water (SLMW).
4. Prior to April 6, 2023 in Area 1 Deep wells consisted of only Stabilized Lake Mead Water as part of the total dissolved solids (TDS)-reduction period of the treatability study water injection.
5. Operations were temporarily suspended on April 3, 2023 due to tank maintenance activities and to prepare the system for Area 1 carbon substrate injection activities to commence on April 6, 2023. Operations were also temporarily suspended April 11 to April 13, 2023 due to well maintenance activities.

**Table 4**  
**Summary of Injection Activities**  
**Area 2 - April 2023**  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area			Area 2 Intermediate								
Well ID			Area 2 Intermediate Duration <sup>(1)</sup>	U4-E-09I				U4-E-10I			
Date	Injection Start Time	Injection Stop Time		Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure
				gallons	gallons	gpm	psi	gallons	gallons	gpm	psi
4/1/2023	5:30	13:29	300	294.87	273.48	1.9	10	296.21	285.03	1.9	9
4/2/2023	5:30	13:36	300	287.03	277.67	1.9	10	294.46	283.82	1.9	8
4/3/2023	--	--	--	--	--	--	--	--	--	--	--
4/4/2023	5:30	13:25	300	280.43	267.37	1.8	11	288.83	287.92	1.9	11
4/5/2023	5:30	13:37	300	296.62	278.69	1.9	10	288.86	286.63	1.9	10
4/6/2023	5:43	14:36	252	274.45	181.58	1.8	9	285.06	190.13	1.9	9
4/7/2023	5:42	14:32	255	256.75	174.91	1.7	9	285.09	199.94	1.9	8
4/8/2023	5:43	14:29	255	283.47	181.58	1.8	10	283.62	192.24	1.9	8
4/9/2023	5:43	14:29	255	276.08	174.57	1.8	9	278.81	196.56	1.9	8
4/10/2023	5:42	14:28	255	263.93	191.50	1.8	8	286.07	192.07	1.9	8
4/11/2023	--	--	--	--	--	--	--	--	--	--	--
4/12/2023	--	--	--	--	--	--	--	--	--	--	--
4/13/2023	--	--	--	--	--	--	--	--	--	--	--
4/14/2023	6:12	13:30	284	300.83	224.90	1.9	13	311.99	242.23	2.0	13
4/15/2023	5:27	12:35	255	278.73	208.23	1.9	10	282.01	202.67	1.9	11
4/16/2023	5:27	12:30	255	284.20	189.15	1.9	10	279.87	201.23	1.9	10
4/17/2023	5:27	12:44	255	277.68	193.85	1.8	8	291.27	203.89	1.9	9
4/18/2023	5:27	12:37	255	266.19	199.23	1.8	8	289.36	200.72	1.9	9
4/19/2023	5:27	12:37	255	280.20	177.14	1.8	9	284.10	205.38	1.9	9
4/20/2023	5:27	12:37	255	266.06	192.42	1.8	8	287.90	199.86	1.9	10
4/21/2023	5:27	12:41	255	277.82	198.26	1.9	9	283.70	198.86	1.9	10
4/22/2023	5:26	12:36	255	298.30	179.32	1.9	7	287.33	198.99	1.9	9
4/23/2023	5:39	12:48	255	285.05	194.92	1.9	8	284.16	199.01	1.9	9
4/24/2023	5:27	13:38	315	287.31	199.56	1.5	9	291.99	205.48	1.6	9
4/25/2023	5:27	12:37	255	285.18	199.74	1.9	7	279.54	206.10	1.9	9
4/26/2023	5:27	12:32	255	297.16	205.48	2.0	7	292.45	211.17	2.0	10
4/27/2023	5:27	12:40	255	273.33	190.28	1.8	8	278.57	200.04	1.9	10
4/28/2023	5:27	12:41	255	282.01	195.16	1.9	9	274.11	201.24	1.9	10
4/29/2023	5:27	12:43	255	288.03	205.90	1.9	9	277.97	187.59	1.8	10
4/30/2023	5:26	12:41	255	285.84	198.02	1.9	9	280.83	195.86	1.9	10
<b>April 2023 Total</b>				<b>7,327.55</b>	<b>5,352.91</b>			<b>7,444.16</b>	<b>5,574.66</b>		
<b>Cumulative Total</b>				<b>77,774.18</b>	<b>65,131.93</b>			<b>77,946.10</b>	<b>65,394.41</b>		

Notes:

gpm - gallons per minute

psi - pounds per square inch

1. Injection duration indicates the total minutes of active injection per day, accounting for any downtime in injections that may have occurred throughout the day. Therefore, injection duration may be less than the difference in daily injection start and stop times indicated.

2. Carbon substrate solution is batch mixed. Batches of carbon substrate solution includes the following components in solution with Stabilized Lake Mead Water (SLMW): 0.5% molasses, 1.25% 0.5 Molar Sodium Bicarbonate Solution, 0.001% trace mineral solution, and 5 milligrams per liter Vitamin B12.

3. Distribution water solution is batch mixed. Batches of distribution water solution includes 0.0025 pounds of Vitamin C per gallon of Stabilized Lake Mead Water (SLMW).

4. Operations were temporarily suspended on April 3, 2023 due to tank maintenance activities and to prepare the system for Area 1 carbon substrate injection activities to commence on April 6, 2023. Operations were also temporarily suspended April 11 to April 13, 2023 due to well maintenance activities.

**Table 4**  
**Summary of Injection Activities**  
**Area 2 - April 2023**  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area			Area 2 Deep																
Well ID			Area 2 Deep Duration <sup>(1)</sup>	U4-E-06D				U4-E-07D				U4-E-09D				U4-E-010D			
Date	Injection Start Time	Injection Stop Time		Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure
				gallons	gallons	gpm	psi	gallons	gallons	gpm	psi	gallons	gallons	gpm	psi	gallons	gallons	gpm	psi
4/1/2023	5:30	13:57	462	294.51	175.38	1.0	29	298.75	184.76	1.0	18	293.71	182.19	1.0	14	291.18	180.90	1.0	14
4/2/2023	5:30	14:14	479	301.97	187.22	1.0	28	299.05	172.12	1.0	18	294.31	172.73	1.0	14	295.77	173.79	1.0	13
4/3/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/4/2023	5:30	13:59	464	284.43	179.29	1.0	30	287.56	184.94	1.0	19	283.92	184.71	1.0	14	279.41	179.93	1.0	17
4/5/2023	5:30	14:05	470	299.64	171.00	1.0	29	289.07	185.44	1.0	17	285.76	179.33	1.0	14	292.16	183.79	1.0	17
4/6/2023	5:43	16:23	487	276.29	200.14	1.0	28	279.13	210.69	1.0	17	287.53	210.23	1.0	14	278.33	212.63	1.0	15
4/7/2023	5:42	16:20	492	278.86	216.90	1.0	28	279.37	210.06	1.0	16	279.30	207.81	1.0	13	278.97	210.44	1.0	14
4/8/2023	5:43	16:12	482	276.57	215.31	1.0	30	272.99	210.28	1.0	16	273.13	207.29	1.0	12	280.90	212.46	1.0	14
4/9/2023	5:43	16:17	487	280.27	202.71	1.0	28	283.28	217.07	1.0	16	273.06	204.37	1.0	14	279.50	213.58	1.0	13
4/10/2023	5:42	16:14	484	275.06	212.83	1.0	27	272.13	215.49	1.0	16	275.63	201.24	1.0	14	275.89	210.76	1.0	13
4/11/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/12/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/13/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/14/2023	6:12	14:52	477	274.65	197.67	1.0	32	284.93	207.98	1.0	18	286.28	209.03	1.0	18	286.56	198.96	1.0	18
4/15/2023	5:27	14:21	481	278.75	207.37	1.0	29	277.21	213.84	1.0	18	273.69	210.71	1.0	16	261.54	202.74	1.0	15
4/16/2023	5:27	14:19	488	284.13	214.21	1.0	28	278.16	229.63	1.0	16	274.95	217.88	1.0	14	269.51	215.02	1.0	14
4/17/2023	5:27	14:32	497	284.06	208.45	1.0	26	292.65	223.23	1.0	18	289.46	211.29	1.0	14	265.50	224.17	1.0	12
4/18/2023	5:27	14:27	493	282.70	213.07	1.0	26	288.99	235.26	1.1	18	285.07	214.30	1.0	14	256.91	210.18	0.9	14
4/19/2023	5:27	14:26	487	284.08	221.20	1.0	27	275.14	237.65	1.1	17	274.60	208.30	1.0	15	261.35	214.66	1.0	14
4/20/2023	5:27	14:28	491	284.38	214.78	1.0	26	279.54	233.92	1.0	18	282.82	222.48	1.0	15	266.69	219.69	1.0	14
4/21/2023	5:27	14:32	496	278.47	220.70	1.0	28	278.96	228.02	1.0	17	287.65	218.01	1.0	15	268.09	218.75	1.0	15
4/22/2023	5:26	14:27	493	283.29	217.46	1.0	26	281.84	225.78	1.0	18	282.10	223.69	1.0	14	273.98	236.20	1.0	14
4/23/2023	5:39	14:42	500	286.71	216.67	1.0	28	278.72	224.16	1.0	17	280.46	221.24	1.0	14	278.25	216.06	1.0	14
4/24/2023	5:27	14:28	496	292.16	212.10	1.0	27	278.13	228.76	1.0	16	284.64	212.16	1.0	14	274.53	216.58	1.0	14
4/25/2023	5:27	14:22	489	267.82	198.65	1.0	27	283.19	225.85	1.0	16	284.98	212.50	1.0	14	276.09	216.26	1.0	13
4/26/2023	5:27	14:13	480	276.59	212.32	1.0	27	266.65	219.80	1.0	16	272.93	200.26	1.0	14	277.58	218.90	1.0	14
4/27/2023	5:27	14:35	498	277.70	222.18	1.0	27	283.63	232.21	1.0	18	280.64	220.26	1.0	14	285.15	220.70	1.0	13
4/28/2023	5:27	14:39	504	277.68	227.38	1.0	29	283.48	228.76	1.0	17	272.23	218.03	1.0	13	280.10	224.53	1.0	13
4/29/2023	5:27	14:37	502	291.99	222.55	1.0	28	282.13	230.37	1.0	18	283.21	217.45	1.0	13	286.77	223.97	1.0	14
4/30/2023	5:26	14:31	498	270.97	217.85	1.0	28	287.31	233.77	1.0	16	287.37	219.88	1.0	14	270.01	217.17	1.0	14
<b>April 2023 Total</b>				<b>7,343.73</b>	<b>5,405.39</b>			<b>7,341.99</b>	<b>5,649.84</b>			<b>7,329.43</b>	<b>5,407.37</b>			<b>7,190.72</b>	<b>5,472.82</b>		
<b>Cumulative Total</b>				<b>41,990.85</b>	<b>27,361.84</b>			<b>42,381.03</b>	<b>27,886.28</b>			<b>41,739.16</b>	<b>27,535.86</b>			<b>41,431.73</b>	<b>27,404.15</b>		

- Notes:
- gpm - gallons per minute
  - psi - pounds per square inch
  - 1. Injection duration indicates the total minutes of active injection per day, accounting for any downtime in injections that may have occurred throughout the day. Therefore, injection duration may be less than the difference in daily injection start and stop times indicated.
  - 2. Carbon substrate solution is batch mixed. Batches of carbon substrate solution includes the following components in solution with Stabilized Lake Mead Water (SLMW): 0.5% molasses, 1.25% 0.5 Molar Sodium Bicarbonate Solution, 0.001% trace mineral solution, and 5 milligrams per liter Vitamin B12.
  - 3. Distribution water solution is batch mixed. Batches of distribution water solution includes 0.0025 pounds of Vitamin C per gallon of Stabilized Lake Mead Water (SLMW).
  - 4. Operations were temporarily suspended on April 3, 2023 due to tank maintenance activities and to prepare the system for Area 1 carbon substrate injection activities to commence on April 6, 2023. Operations were also temporarily suspended April 11 to April 13, 2023 due to well maintenance activities.





**Table 5**  
**Groundwater Analytical Results**  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	E314.0		E300.1			Anions by E300.0/SW9065A			E350.1	E351.2	E365.1	Alkalinity by SM2320B				Dissolved Metals by SW6020							
						Perchlorate	Chlorate	Chlorite	Chloride	Nitrate (as N)	Sulfate	Ammonia (as N)	Total Kjeldahl Nitrogen (TKN)	Phosphorus	Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Antimony	Arsenic	Cadmium	Copper	Lead	Nickel	Selenium	Silver	Thallium	Uranium
U4-MW-12D	4/15/2022	N	BL02	UMCF	97.1 - 107.1	1,280,000	14,400,000	<24,000	<117	<3,500	67.4 J	3,380,000	61,000	1,130,000	138,000	138,000	<8,450	<8,450	<92.5	<5.15	14.8	64.9 J+	<0.950	<0.750	662,000	48,500	<0.298	<7.55

Notes:  
 FD - Field duplicate  
 E - Field instrument error.  
 J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.  
 J- - The result is an estimated quantity, but the result may be biased low.  
 J+ - The result is an estimated quantity, but the result may be biased high.  
 mg/L - milligrams per liter  
 µg/L - micrograms per liter  
 N - Normal field sample  
 R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.  
 UMCf- Upper Muddy Creek Formation  
 < - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.  
 -- Not tested.



Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Dissolved Metals by SW6020	Dissolved Metals by SW6010B													FIELD TESTS									
							Zinc	Aluminum	Barium	Beryllium	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Molybdenum	Phosphorus	Potassium	Sodium	Vanadium	Conductivity	Dissolved Oxygen	Ferrous Iron	Oxidation-Reduction Potential	pH	Purge Rate	Sulfide	Temperature
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mS/cm	mg/L	mg/L	mV	SU	mL/min	mg/L	C
M-247-100	4/20/2022	N	BL02	UMCf	100.5 - 110.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0.956	1.80	0.0 U	22.9	8.02	190	0.0 U	26.9	
M-249-100	4/20/2022	N	BL02	UMCf	99.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	34.552	0.56	0.0 U	140.6	6.99	120	0.0 U	27.5	
M-251-100	4/19/2022	N	BL02	UMCf	92.5 - 102.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	42.112	1.63	0.0 U	212.1	7.36	100	0.0 U	26.3	
M-251-100	10/13/2022	N	EM02	UMCf	92.5 - 102.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.998	4.13	----	172.0	7.19	280	----	24.9	
M-251-100	11/2/2022	N	EM03	UMCf	92.5 - 102.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	18.268	4.61	----	118.7	7.71	250	----	24.1	
M-251-100	12/8/2022	N	EM04	UMCf	92.5 - 102.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	19.870	4.83	----	123.6	7.38	100	----	22.0	
M-251-100	1/11/2023	N	EM05	UMCf	92.5 - 102.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9.502	5.52	----	132.4	7.49	250	----	23.0	
M-251-100	2/13/2023	N	EM06	UMCf	92.5 - 102.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	10.973	6.27	----	184.3	8.08	80	----	23.4	
M-251-60	4/18/2022	N	BL02	UMCf	52.3 - 62.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.163	5.64	0.0 U	44.4	10.69	100	0.0 U	30.5	
M-252	4/21/2022	N	BL02	UMCf	132.3 - 142.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.053	5.66	0.0 U	142.6	8.13	100	0.0 U	29.6	
M-253-100	4/20/2022	N	BL02	UMCf	100.8 - 110.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.393	3.04	0.0 U	36.4	8.03	60	0.0 U	25.2	
M-255-100	4/20/2022	N	BL02	UMCf	100.2 - 110.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.198	1.87	0.0 U	175.7	7.89	100	0.0 U	25.1	
U4-E-01D	4/18/2022	N	BL02	UMCf	94.7 - 109.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	42.734	0.85	0.0 U	167.3	7.78	100	0.0 U	26.2	
U4-E-01I	4/19/2022	N	BL02	UMCf	74.6 - 89.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0.072	9.17	0.0 U	120.6	8.70	100	0.0 U	26.5	
U4-E-01I	4/19/2022	FD	BL02	UMCf	74.6 - 89.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
U4-E-02D	4/20/2022	N	BL02	UMCf	94.4 - 109.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9.255	0.62	0.0 U	129.9	7.36	130	0.0 U	27.0	
U4-E-02I	4/18/2022	N	BL02	UMCf	74.4 - 89.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9.309	4.25	0.0 U	190.6	8.46	105	0.0 U	24.6	
U4-E-03D	4/19/2022	N	BL02	UMCf	95.1 - 110.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	36.139	0.68	0.0 U	96.0	7.14	200	0.0 U	28.6	
U4-E-03D	10/13/2022	N	EM02	UMCf	95.1 - 110.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
U4-E-03D	11/3/2022	N	EM03	UMCf	95.1 - 110.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.802	4.86	----	109.3	7.34	----	----	17.8	
U4-E-03D	12/6/2022	N	EM04	UMCf	95.1 - 110.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.752	6.10	----	198.2	7.40	----	----	22.1	
U4-E-03D	1/9/2023	N	EM05	UMCf	95.1 - 110.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9.776	7.80	----	117.4	7.79	----	----	21.2	
U4-E-03D	2/13/2023	N	EM06	UMCf	95.1 - 110.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.469	7.00	----	83.8	7.44	----	----	22.4	
U4-E-04D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	22.249	1.29	0.0 U	34.2	7.19	70	0.0 U	25.5	
U4-E-04I	4/18/2022	N	BL02	UMCf	75.0 - 90.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4.524	0.84	0.0 U	-18.2	8.40	70	0.0 U	27.4	
U4-E-05D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	26.037	3.43	0.0 U	177.7	7.33	100	0.0 U	28.8	
U4-E-05I	4/19/2022	N	BL02	UMCf	75.0 - 90.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.209	0.59	0.0 U	101.8	8.45	100	0.0 U	28.4	
U4-E-06D	4/11/2022	N	BL02	UMCf	95.1 - 110.1	<18.0	<0.849	255,000 J	19.9	3.31 J	5.53	25.3 J	32,800 J	2.53	<0.0700	1,310,000	<0.121	5.59	<4.99	5.24 J	9.911	2.39	0.0 U	138.8	7.24	90	0.0 U	23.5	
U4-E-06I	4/11/2022	N	BL02	UMCf	73.2 - 88.2	<18.0	<0.849	88,400	8.86 J	13.6	<0.816	45.1 J	23,300	2.37	<0.0700	624,000	<0.121	7.83	17.4 J	4.73 J	4.282	2.10	0.0 U	128.1	7.47	90	0.0 U	25.8	
U4-E-06I	4/11/2022	FD	BL02	UMCf	73.2 - 88.2	<18.0	<0.849	87,900	8.46 J	13.9	<0.816	46.2 J	23,200	2.53	<0.0700	622,000	<0.121	7.85	15.5 J	5.71 J	----	----	----	----	----	----	----	----	
U4-E-06I	10/12/2022	N	EM02	UMCf	73.2 - 88.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
U4-E-06I	11/3/2022	N	EM03	UMCf	73.2 - 88.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
U4-E-06I	12/6/2022	N	EM04	UMCf	73.2 - 88.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.809	2.83	----	-204.0	6.62	----	----	23.2	
U4-E-06I	1/9/2023	N	EM05	UMCf	73.2 - 88.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3.965	55.80	----	111.2	6.81	----	----	23.0	
U4-E-06I	2/13/2023	N	EM06	UMCf	73.2 - 88.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	8.481	6.55	----	-78.1	6.72	----	----	23.0	
U4-E-07D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<90.0	<8.49	634,000	22.5 J	8.85 J	<8.16	<91.5	74,800	9.10 J	<0.700	5,760,000	<1.21	5.33 J	<25.0	<30.2	28.599	1.02	0.0 U	134.9	7.20	100	0.0 U	18.5	
U4-E-07I	4/12/2022	N	BL02	UMCf	74.7 - 89.7	<18.0	<0.849	66,000	8.86 J	18.0	1.14 J	194 J	23,400	3.34	<0.0700	1,610,000	<0.121	9.05	45.7	3.42 J	6.791	2.78	0.0 U	164.9	8.12	100	0.0 U	20.2	
U4-E-07I	10/11/2022	N	EM02	UMCf	74.7 - 89.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
U4-E-07I	11/3/2022	N	EM03	UMCf	74.7 - 89.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	14.508	4.32	----	191.3	7.16	----	----	22.3	
U4-E-07I	12/6/2022	N	EM04	UMCf	74.7 - 89.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	13.019	2.90	----	29.1	7.20	----	----	24.0	
U4-E-07I	1/9/2023	N	EM05	UMCf	74.7 - 89.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	7.227	4.15	----	90.9	7.45	----	----	21.9	
U4-E-07I	2/13/2023	N	EM06	UMCf	74.7 - 89.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	12.582	6.63	----	28.0	7.84	----	----	21.8	
U4-E-08D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<90.0	<8.49	737,000	54.7	10.2 J	<8.16	<91.5	82,200	7.15 J	<0.700	6,200,000	<1.21	7.00 J	<25.0	<30.2	31.747	1.11	0.0 U	185.4	7.17	100	0.0 U	20.2	
U4-E-08D	10/11/2022	N	EM02	UMCf	94.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
U4-E-08D	11/3/2022	N	EM03	UMCf	94.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	22.510	2.00	----	-21.2	6.86	----	----	21.8	
U4-E-08D	12/6/2022	N	EM04	UMCf	94.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	17.697	3.19	----	140.3	7.03	----	----	23.8	
U4-E-08D	1/9/2023	N	EM05	UMCf	94.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	10.120	58.00	----	94.3	7.21	----	----	21.7	
U4-E-08D	2/13/2023	N	EM06	UMCf	94.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.329	6.82	----	139.4	7.51	----	----	21.7	
U4-E-09D	4/15/2022	N	BL02	UMCf	94.5 - 109.5	18.8 J	<8.49	360,000	23.2	<5.80	<8.16	172 J	46,900	3.01 J	<0.700	1,840,000	<1.21	5.49 J	7.06 J	<30.2	16.373	1.12	0.0 U	131.3	7.20	100	0.0 U	26.7	
U4-E-09I	4/14/2022	N	BL02	UMCf	74.9 - 89.9	<18.0	<0.849	91,600	21.6	13.2	2.61	199 J	25,300	2.47	<0.0700	1,100,000	<0.121	9.29	16.8 J	3.75 J	6.980	5.93	0.0 U	42.3	7.51	100	0.0 U	25.0	
U4-E-10D	4/13/2022	N	BL02	UMCf	94.5 - 109.5	<18.0	<0.849	165,000	7.51 J	8.19	20.5	34.0 J	29,700	2.51	<0.0700	1,120,000	<0.121	1.64	6.53 J	<30.2	8.624	0.77	0.0 U	200.4	8.07	100	0.0 U	23.0	
U4-E-10I	4/13/2022	N	BL02	UMCf	74.2 - 89.2	<18.0	<0.849	133,000	7.93 J	11.6	2.29	<18.3	26,000	2.58	<0.0700	1,410,000	<0.121	10.6	14.5 J	7.05 J	9.367	1.04	0.0 U	223.7	7.20	100	0.0 U	21.6	
U4-MW-01D	4/19/2022	N	BL02	UMCf	96.																								

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Dissolved Metals by SW6020	Dissolved Metals by SW6010B														FIELD TESTS								
							Zinc	Aluminum	Barium	Beryllium	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Molybdenum	Phosphorus	Potassium	Sodium	Vanadium	Conductivity	Dissolved Oxygen	Ferrous Iron	Oxidation-Reduction Potential	pH	Purge Rate	Sulfide	Temperature
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mS/cm	mg/L	mg/L	mV	SU	mL/min	mg/L	C
U4-MW-03I	4/19/2022	N	BL02	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6.055	1.28	0.0 U	57.0	8.02	60	0.0 U	30.2
U4-MW-03S	4/18/2022	N	BL02	UMcf	54.5 - 64.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4.716	9.18	0.0 U	105.4	9.74	195	0.0 U	27.3
U4-MW-04D	4/19/2022	N	BL02	UMcf	97.0 - 107.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	50.188	0.90	0.0 U	76.7	7.01	200	0.0 U	30.1
U4-MW-04D	2/16/2023	N	EM06	UMcf	97.0 - 107.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.802	7.81	----	185.1	7.60	60	----	21.5
U4-MW-04I	4/19/2022	N	BL02	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	22.833	0.68	0.0 U	49.8	7.36	100	0.0 U	27.6
U4-MW-05D	4/15/2022	N	BL02	UMcf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	39.740	0.77	0.0 U	146.1	7.03	100	0.0 U	28.3
U4-MW-05D	10/13/2022	N	EM02	UMcf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	24.933	3.56	----	190.6	7.02	280	----	28.3
U4-MW-05D	11/3/2022	N	EM03	UMcf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	17.012	4.46	----	121.3	7.64	140	----	23.6
U4-MW-05D	12/7/2022	N	EM04	UMcf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.306	4.72	----	143.6	7.59	0	----	23.1
U4-MW-05D	1/11/2023	N	EM05	UMcf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	10.893	5.62	----	187.0	7.27	250	----	22.5
U4-MW-05D	2/14/2023	N	EM06	UMcf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.665	7.00	----	190.5	7.55	80	----	15.4
U4-MW-05I	4/15/2022	N	BL02	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	20.080	0.87	0.0 U	140.1	7.54	100	0.0 U	23.2
U4-MW-05I	10/13/2022	N	EM02	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	24.065	2.94	----	205.5	7.04	280	----	25.6
U4-MW-05I	11/3/2022	N	EM03	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	21.533	3.08	----	130.9	7.57	240	----	24.1
U4-MW-05I	12/8/2022	N	EM04	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0.258	6.78	----	132.0	7.34	100	----	23.3
U4-MW-05I	1/11/2023	N	EM05	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	12.599	4.84	----	192.5	7.29	250	----	23.1
U4-MW-05I	2/14/2023	N	EM06	UMcf	76.6 - 86.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.446	5.76	----	179.4	7.53	80	----	22.3
U4-MW-06D	4/19/2022	N	BL02	UMcf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0.0 U	----	----	----	0.0 U	----	----
U4-MW-06D	2/15/2023	N	EM06	UMcf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.354	5.93	----	198.6	7.34	80	----	21.3
U4-MW-06I	4/19/2022	N	BL02	UMcf	76.5 - 86.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6.356	0.75	0.0 U	132.2	8.14	100	0.0 U	27.5
U4-MW-07D	4/15/2022	N	BL02	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	10.924	4.48	0.0 U	182.2	7.48	100	0.0 U	26.7
U4-MW-07D	10/12/2022	N	EM02	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.057	6.89	----	93.5	7.79	50	----	28.7
U4-MW-07D	10/12/2022	FD	EM02	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
U4-MW-07D	11/3/2022	N	EM03	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.730	6.43	----	111.1	7.85	200	----	23.9
U4-MW-07D	12/7/2022	N	EM04	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.462	8.66	----	106.4	7.83	100	----	23.8
U4-MW-07D	1/11/2023	N	EM05	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.736	11.30	----	105.0	7.74	120	----	24.3
U4-MW-07D	2/14/2023	N	EM06	UMcf	96.8 - 106.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.217	9.30	----	161.8	7.79	90	----	22.3
U4-MW-07I	4/15/2022	N	BL02	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.556	0.59	0.0 U	158.2	7.86	100	0.0 U	25.6
U4-MW-07I	10/12/2022	N	EM02	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.078	6.24	----	135.0	7.86	50	----	26.9
U4-MW-07I	11/3/2022	N	EM03	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.794	6.05	----	141.5	7.93	180	----	23.9
U4-MW-07I	12/7/2022	N	EM04	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.562	8.32	----	96.7	7.97	100	----	24.0
U4-MW-07I	1/11/2023	N	EM05	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.955	9.11	----	104.4	7.82	150	----	24.3
U4-MW-07I	2/15/2023	N	EM06	UMcf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.786	8.45	----	124.7	7.66	80	----	22.3
U4-MW-08D	4/13/2022	N	BL02	UMcf	98.6 - 108.6	<90.0	<8.49	707,000	37.2 J	11.9 J	<8.16	<91.5	102,000	7.61 J	<0.700	7,950,000	<1.21	10.1	<25.0	<30.2	43.677	1.07	0.0 U	166.4	6.92	100	0.0 U	24.7	
U4-MW-08D	12/7/2022	N	EM04	UMcf	98.6 - 108.6	<140	<4.24	330,000	11.7 J	3.10 J	<4.08	----	43,000	4.50 J	<0.350	3,880,000	<0.605	24.7	6.96 J	<15.1	15.745	1.70	0.0 U	52.2	6.62	250	0.0 U	22.4	
U4-MW-08DD	4/20/2022	N	BL02	UMcf	119.8 - 129.8	<18.0	<0.849	28,400	14.7	9.57	1.49 J	110 J	11,000	2.68	<0.0700	258,000	<0.121	3.24	10.4 J	<3.02	1.774	0.95	0.0 U	5.0	7.70	70	0.0 U	24.6	
U4-MW-08DD	4/20/2022	FD	BL02	UMcf	119.8 - 129.8	<18.0	<0.849	28,400	14.6	9.89	1.44 J	107 J	11,100	2.31	<0.0700	258,000	<0.121	3.20	9.34 J	<3.02	----	----	----	----	----	----	----	----	----
U4-MW-08DD	12/8/2022	N	EM04	UMcf	119.8 - 129.8	<28.1	<0.849	23,100	31.7	10.9	3.15	----	9,950	2.00	<0.0700	179,000	<0.121	3.17	8.61	23.0 J	1.034	1.20	0.0 U	138.4	7.44	200	0.0 U	21.4	
U4-MW-08I	4/13/2022	N	BL02	UMcf	78.0 - 88.0	<18.0	<0.849	44,400	5.20 J	18.7	0.820 J	25.4 J	23,000	2.69	<0.0700	1,300,000	<0.121	6.55	23.5	3.30 J	8.786	1.97	0.0 U	183.3	7.71	100	0.0 U	22.8	
U4-MW-08I	12/7/2022	N	EM04	UMcf	78.0 - 88.0	<140	<4.24	166,000	29.6	12.8 J	113	----	36,600	3.16 J	<0.350	2,570,000	<0.605	23.7	18.2 J	<15.1	8.950	2.32	0.0 U	137.7	7.48	250	0.0 U	22.7	
U4-MW-08I	12/7/2022	FD	EM04	UMcf	78.0 - 88.0	<140	<4.24	163,000	28.6	12.7 J	106	----	36,200	3.40 J	<0.350	2,540,000	<0.605	23.2	18.3 J	<15.1	----	----	----	----	----	----	----	----	----
U4-MW-08S	4/15/2022	N	BL02	UMcf	54.9 - 64.9	26.0 J	<0.849	3,570	<0.934	20.1	<0.816	<18.3	20,400	2.19	<0.0700	580,000	<0.121	0.591 J	47.5	<3.02	3.391	3.42	0.0 U	79.6	9.96	285	0.0 U	27.1	
U4-MW-08S	12/7/2022	N	EM04	UMcf	54.9 - 64.9	31.9 J	<0.849	30,800	10.2	20.4	3.02	----	18,200	1.95 J	<0.0700	624,000	<0.121	13.4	49.2	<3.02	2.838	2.17	0.0 U	40.0	8.08	250	0.0 U	22.4	
U4-MW-08S	12/7/2022	FD	EM04	UMcf	54.9 - 64.9	39.7 J	<0.849	30,800	10.5	20.0	2.30	----	17,900	1.80 J	<0.0700	612,000	<0.121	13.2	48.5	4.34 J	----	----	----	----	----	----	----	----	----
U4-MW-09D	4/14/2022	N	BL02	UMcf	96.9 - 106.9	<18.0	<8.49	532,000	4.62 J	<1.16	<8.16	<18.3	6,610	3.90 J	<0.700	475,000	<1.21	10.2	<4.99	165 J	25.834	1.79	0.0 U	36.4	7.03	100	0.0 U	24.3	
U4-MW-09D	12/6/2022	N	EM04	UMcf	96.9 - 106.9	<28.1 UJ	<0.849 UJ	71,500	5.78	6.30	11.1	----	12,100	1.98 J	<0.0700 UJ	680,000	<0.121 UJ	9.26	23.1	<3.02 UJ	3.375	6.84	0.0 U	104.4	7.69	200	0.0 U	22.1	
U4-MW-09DD	4/14/2022	N	BL02	UMcf	119.8 - 129.8	18.0 J	<0.849	20,000	7.39 J	9.61	<0.816	221 J	7,460	1.98 J	<0.0700	181,000	<0.121	2.98	9.16 J	3.03 J	1.339	1.49	0.0 U	144.1	7.81	100	0.0 U	23.2	
U4-MW-09DD	12/6/2022	N	EM04	UMcf	119.8 - 129.8	<28.1 UJ	<0.849 UJ	21,100	1.17 J	9.02	<0.816 UJ	----	7,030	1.86 J	<0.0700 UJ	162,000	<0.121 UJ	3.11	10.6	<3.02 UJ	1.036	1.23	0.0 U	63.9	7.85	250	0.0 U	22.6	
U4-MW-09I	4/14/2022	N	BL02	UMcf	76.8 - 86.8	<18.0	<0.849	42,300	4.58 J	13.2	0.971 J	172 J	19,300	2.24	<0.0700	588,000	<0.121	5.48	19.1 J	<3.02	3.354	10.37	0.0 U	8.8	7.57</				

**Table 5**  
**Groundwater Analytical Results**  
 Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Dissolved Metals by SW6010B															FIELD TESTS							
						Dissolved Metals by SW6020															Conductivity	Dissolved Oxygen	Ferrous Iron	Oxidation-Reduction Potential	pH	Purge Rate	Sulfide	Temperature
						Zinc	Aluminum	Barium	Beryllium	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Molybdenum	Phosphorus	Potassium	Sodium	Vanadium								
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mS/cm	mg/L	mg/L	mV	SU	mL/min	mg/L	C			
U4-MW-12D	4/15/2022	N	BL02	UMCf	97.1 - 107.1	92.3 J	<8.49	501,000	59.4	15.8 J	<8.16	365 J	83,300	6.13 J	<0.700	4,920,000	<1.21	10.8	<4.99	<30.2	32.048	0.90	0.0 U	90.8	6.98	100	0.0 U	26.2
U4-MW-12D	9/27/2022	N	EM01	UMCf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	17.403	5.30	0.0 U	183.7	7.31	100	0.0 U	27.2
U4-MW-12D	10/12/2022	N	EM02	UMCf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.998	2.16	0.0 U	193.7	7.02	250	0.0 U	23.4
U4-MW-12D	11/2/2022	N	EM03	UMCf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9.367	1.89	0.0 U	145.9	7.12	250	0.0 U	20.8
U4-MW-12D	12/7/2022	N	EM04	UMCf	97.1 - 107.1	<140	<4.24	300,000	23.4 J	8.18 J	<4.08	----	43,100	3.67 J	<0.350	3,260,000	<0.605	23.3	9.35 J	20.1 J	15.505	2.44	0.0 U	41.1	7.21	100	0.0 U	17.7
U4-MW-12D	1/12/2023	N	EM05	UMCf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9.215	1.80	0.0 U	94.5	6.98	250	0.0 U	21.3
U4-MW-12D	2/15/2023	N	EM06	UMCf	97.1 - 107.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.607	1.11	0.0 U	42.6	6.93	210	0.0 U	22.0
U4-MW-12I	4/14/2022	N	BL02	UMCf	76.8 - 86.8	18.3 J	2.29	126,000	44.1	17.6	4.10 J	122 J	35,700	5.65 J	0.454 J	1,720,000	2.39	9.47	9.09 J	<3.02	11.234	1.32	----	35.2	7.74	100	----	26.1
U4-MW-12I	4/14/2022	FD	BL02	UMCf	76.8 - 86.8	41.4 J	<0.849	125,000	44.4	17.7	1.90 J	265 J+	35,500	3.39 J	<0.0700	1,690,000	<0.121	7.29	6.67 J	<3.02	----	----	----	----	----	----	----	----
U4-MW-12I	9/27/2022	N	EM01	UMCf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3.677	0.92	0.0 U	121.6	7.60	140	0.0 U	27.4
U4-MW-12I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.587	1.25	0.0 U	190.1	7.30	280	0.0 U	23.5
U4-MW-12I	11/2/2022	N	EM03	UMCf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.684	1.15	0.0 U	95.4	7.23	180	0.0 U	22.6
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<28.1	<0.849	44,500	264	15.7	2.09	----	16,700	0.587 J	<0.0700	490,000	<0.121	41.0	6.05	<3.02	2.533	1.36	0.0 U	-290.6	7.38	80	0.6	20.5
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	41.2 J	<0.849	44,600	264	16.2	3.19	----	16,800	0.457 J	<0.0700	499,000	<0.121	41.4	6.27	<3.02	----	----	----	----	----	----	----	----
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0.0 U	----	----	----	----	----
U4-MW-12I	2/15/2023	N	EM06	UMCf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3.485	0.76	0.0 U	-291.6	6.89	210	0.0 U	20.6
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	<90.0	<8.49	664,000	32.9 J	9.95 J	<8.16	140 J	71,200	4.11 J	<0.700	3,990,000	<1.21	10.8	<25.0	<30.2	32.518	0.90	0.0 U	136.1	6.94	100	0.0 U	25.2
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.793	0.96	0.0 U	-329.7	6.65	100	0.0 U	28.9
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.124	1.77	0.0 U	-147.3	6.57	50	0.0 U	23.5
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.404	1.67	0.0 U	26.5	6.45	250	0.0 U	21.5
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<140	<4.24	276,000	92.8	2.40 J	<4.08	----	26,600	2.64 J	<0.350	1,170,000	<0.605	34.4	4.77 J	<15.1	7.937	2.99	0.0 U	122.7	6.70	80	0.0 U	16.8
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4.505	1.39	0.0 U	60.0	6.88	250	0.0 U	21.4
U4-MW-13D	2/15/2023	N	EM06	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	8.150	1.44	0.0 U	65.4	6.90	210	0.0 U	20.6
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	<18.0	<0.849	169,000	28.6	13.8	1.80 J	132 J	33,100	3.62	<0.0700	1,640,000	<0.121	7.29	9.14 J	<3.02	11.607	2.38	0.0 U	127.9	7.42	100	0.0 U	23.7
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.667	2.79	0.0 U	96.9	7.52	100	0.0 U	27.2
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6.053	1.93	0.0 U	110.0	7.58	50	0.0 U	27.9
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.675	2.64	0.0 U	141.8	7.46	250	0.0 U	20.1
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	32.3 J	<0.849 UJ	48,300	161	9.01	2.47	----	16,700	1.08 J	<0.0700 UJ	759,000	<0.121 UJ	38.3	7.72	<3.02 UJ	3.613	1.73	0.0 U	-292.7	7.58	100	0.1	19.9
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.079	1.19	0.0 U	-245.9	7.13	250	0.0 U	20.1
U4-MW-13I	2/14/2023	N	EM06	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3.065	0.61	0.0 U	-309.2	7.19	200	0.0 U	20.7
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	<18.0	<0.849	152,000	79.2	41.2	9.04	<18.3	25,400	3.31	<0.0700	673,000	<0.121	18.5	22.2	<3.02	5.770	0.87	0.0 U	161.5	7.20	100	0.0 U	26.5
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	40.3 J	1.09 J	128,000	21.5	5.90	<0.816 UJ	----	19,100	2.46	<0.0700 UJ	469,000	0.156 J	8.22	14.1	<3.02 UJ	4.415	2.55	0.0 U	75.3	7.39	80	0.0 U	20.7
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<18.0	<0.849	52,400	19.0	16.2	1.09 J	191 J	25,400	2.53	<0.0700	596,000	<0.121	4.68	13.3 J	<3.02	5.720	0.77	0.0 U	110.5	8.07	150	0.0 U	22.8
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<28.1 UJ	<0.849 UJ	139,000	32.4	9.57	1.12 J	----	22,000	2.86	<0.0700 UJ	518,000	0.243 J	15.3	14.3	<3.02 UJ	4.279	2.18	0.0 U	63.8	7.41	80	0.0 U	16.8
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	21.8 J	<0.849	157,000	26.1	9.77	0.944 J	<18.3	25,500	2.38	<0.0700	646,000	0.186 J	13.6	8.06 J	<3.02	5.015	1.02	0.0 U	209.2	7.09	100	0.0 U	20.7
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<18.0	<0.849	92,400	10.3	6.33	<0.816	----	18,700	2.23	<0.0700	436,000	<0.121	11.6	7.40 J	<3.02	2.298	15.40	0.0 U	168.4	7.52	200	0.0 U	22.3
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	162	<0.849	15,400	2.57 J	10.4	2.78	<18.3	6,830	2.15	<0.0700	159,000	<0.121	4.23	17.9 J	<3.02	0.999	2.14	0.0 U	123.8	8.36	100	0.0 U	18.6
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<18.0	<0.849	16,800	5.61 J	7.88	31.6	----	6,430	1.91 J	<0.0700	----	<0.121	3.37	12.9 J	<3.02	0.666	2.14	0.0 U	-139.8	8.59	250	0.0 U	21.5
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	24.4 J	<0.849	56,500	14.9	17.8	<0.816	25.2 J	22,300	2.64	<0.0700	897,000	<0.121	6.59	18.7 J	<3.02	5.348	1.45	0.0 U	125.1	7.95	150	0.0 U	22.6
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	<18.0	<0.849	73,800	61.8	11.5	2.11	----	22,500	2.82	0.105 J	976,000	0.663 J	52.3	14.2 J	<3.02	2.972	1.05	0.0 U	161.9	6.87	250	0.0 U	23.0
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	95.9 J	<0.849	50,100 J	2.61 J	19.2	<0.816	50.3 J	15,200 J	2.71	<0.0700	387,000 J												



**Table 5**  
**Groundwater Analytical Results**  
 Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	FIELD TESTS	RSK175			SM2540C	SW7199	Volatile Organic Compounds by SW8260B														
							Turbidity	Ethane	Ethene			Methane	Total Dissolved Solids	Chromium, Hexavalent	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane
U4-MW-03I	4/19/2022	N	BL02	UMcf	76.6 - 86.6	8489.8	---	---	---	2,350,000	<150 UJ	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-03S	4/18/2022	N	BL02	UMcf	54.5 - 64.5	38.0	---	---	---	2,890,000	1,390 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-03S	4/18/2022	FD	BL02	UMcf	54.5 - 64.5	---	---	---	---	2,190,000 J-	1,390 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-04D	4/19/2022	N	BL02	UMcf	97.0 - 107.0	18.0	---	---	---	56,100,000	103,000 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.560 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-04D	2/16/2023	N	EM06	UMcf	97.0 - 107.0	38.7	---	---	---	---	18,300	<7.35	<7.45	<6.65	<7.90	<5.00	<9.40	<7.10	<11.5	<11.9	<24.1	<16.1 UJ	<13.8			
U4-MW-04I	4/19/2022	N	BL02	UMcf	76.8 - 86.8	78.2	---	---	---	22,500,000	34,300 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05D	4/15/2022	N	BL02	UMcf	98.2 - 108.2	39.5	---	---	---	27,800,000	73,100 J-	<0.147	<0.149	<0.133	<0.158	0.181 J	0.659 J	0.565 J	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-05D	10/13/2022	N	EM02	UMcf	98.2 - 108.2	235.7	---	---	---	30,400,000 J-	69,500	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6			
U4-MW-05D	11/3/2022	N	EM03	UMcf	98.2 - 108.2	92823.7	---	---	---	15,100,000	46,500	<0.147	<0.149	<0.133	<0.158	0.118 J	0.278 J	0.297 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05D	12/7/2022	N	EM04	UMcf	98.2 - 108.2	106.9	---	---	---	15,100,000	44,900	<0.147	<0.149	<0.133	<0.158	0.116 J	0.436 J	0.544 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05D	1/11/2023	N	EM05	UMcf	98.2 - 108.2	138.6	---	---	---	10,200,000	44,700	<0.147	<0.149	<0.133	<0.158	0.106 J	0.330 J	0.362 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05D	2/14/2023	N	EM06	UMcf	98.2 - 108.2	268.7	---	---	---	9,200,000	31,800	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6			
U4-MW-05I	4/15/2022	N	BL02	UMcf	76.6 - 86.6	2057.3	---	---	---	12,900,000	42,800 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.359 J	0.311 J	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-05I	10/13/2022	N	EM02	UMcf	76.6 - 86.6	1860.6	---	---	---	29,100,000	70,800	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6			
U4-MW-05I	11/3/2022	N	EM03	UMcf	76.6 - 86.6	90637.6	---	---	---	22,800,000	61,900 J-	<0.147	<0.149	<0.133	<0.158	0.154 J	0.448 J	0.557 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05I	12/8/2022	N	EM04	UMcf	76.6 - 86.6	1119.7	---	---	---	19,400,000 J	49,600	<0.147	<0.149	<0.133	<0.158	0.135 J	0.345 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05I	1/11/2023	N	EM05	UMcf	76.6 - 86.6	7501.5	---	---	---	10,300,000	45,300	<0.147	<0.149	<0.133	<0.158	<0.100	0.289 J	0.462 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05I	2/14/2023	N	EM06	UMcf	76.6 - 86.6	1495.6	---	---	---	9,860,000	36,900	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6			
U4-MW-06D	4/19/2022	N	BL02	UMcf	97.1 - 107.1	---	---	---	---	43,400,000	73,100 J-	<0.147	<0.149	<0.133	<0.158	0.134 J	0.315 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-06D	2/15/2023	N	EM06	UMcf	97.1 - 107.1	76.0	---	---	---	---	36,900 J-	<7.35	<7.45	<6.65	<7.90	<5.00	<9.40	<7.10	<11.5	<11.9	<24.1	<16.1	<13.8			
U4-MW-06I	4/19/2022	N	BL02	UMcf	76.5 - 86.5	171.5	---	---	---	3,420,000	3,070 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	4/15/2022	N	BL02	UMcf	96.8 - 106.5	52.5	---	---	---	5,820,000	23,900 J+	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-07D	10/12/2022	N	EM02	UMcf	96.8 - 106.5	9.7	---	---	---	1,310,000 J-	2,080	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	10/12/2022	FD	EM02	UMcf	96.8 - 106.5	---	---	---	---	1,330,000	2,120	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	11/3/2022	N	EM03	UMcf	96.8 - 106.5	97.4	---	---	---	1,220,000 J+	1,610 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	12/7/2022	N	EM04	UMcf	96.8 - 106.5	14.1	---	---	---	1,050,000	1,080 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	1/11/2023	N	EM05	UMcf	96.8 - 106.5	22.8	---	---	---	1,260,000	1,380 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	2/14/2023	N	EM06	UMcf	96.8 - 106.5	73.4	---	---	---	1,070,000	1,250 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	4/15/2022	N	BL02	UMcf	76.8 - 86.8	10.7	---	---	---	1,670,000	4,810 J+	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-07I	10/12/2022	N	EM02	UMcf	76.8 - 86.8	119.0	---	---	---	1,350,000 J	2,720	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	11/3/2022	N	EM03	UMcf	76.8 - 86.8	1667.5	---	---	---	1,340,000	1,650 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	12/7/2022	N	EM04	UMcf	76.8 - 86.8	210.3	---	---	---	1,220,000	1,360 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	1/11/2023	N	EM05	UMcf	76.8 - 86.8	73.4	---	---	---	1,440,000	1,810 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	2/15/2023	N	EM06	UMcf	76.8 - 86.8	134.0	---	---	---	1,520,000	2,640 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230 UJ	<0.237	<0.481	<0.322	<0.276			
U4-MW-08D	4/13/2022	N	BL02	UMcf	98.6 - 108.6	98.8 E	<4.07	<4.26	<2.91	48,000,000	106,000	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08D	12/7/2022	N	EM04	UMcf	98.6 - 108.6	21.7	<4.07	<4.26	166	14,700,000	52,900 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.391 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08DD	4/20/2022	N	BL02	UMcf	119.8 - 129.8	62.4	<4.07	<4.26	<2.91	1,240,000	694	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08DD	4/20/2022	FD	BL02	UMcf	119.8 - 129.8	---	<4.07	<4.26	<2.91	1,220,000	723	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08DD	12/8/2022	N	EM04	UMcf	119.8 - 129.8	20.3	<4.07	<4.26	<2.91	751,000 J	384	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08I	4/13/2022	N	BL02	UMcf	78.0 - 88.0	5857914.0 E	<4.07	<4.26	<2.91	3,380,000	7,950	<0.147	<0.149	<0.133	<0.158	<0.100	1.02	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08I	12/7/2022	N	EM04	UMcf	78.0 - 88.0	304.1	<4.07	<4.26	57.2	11,000,000	33,700	<0.147	<0.149	<0.133	<0.158	<0.100	0.223 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08I	12/7/2022	FD	EM04	UMcf	78.0 - 88.0	---	<4.07	<4.26	55.5	---	34,200 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.232 J	0.238 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08S	4/15/2022	N	BL02	UMcf	54.9 - 64.9	55.4	<4.07	<4.26	<2.91	1,970,000	506 J+	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-08S	12/7/2022	N	EM04	UMcf	54.9 - 64.9	182.5	<4.07	<4.26	427	1,600,000	254 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08S	12/7/2022	FD	EM04																							

**Table 5**  
**Groundwater Analytical Results**  
 Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	FIELD TESTS	RSK175			SM2540C	SW7199	Volatile Organic Compounds by SW8260B											
						Turbidity	Ethane	Ethene	Methane	Total Dissolved Solids	Chromium, Hexavalent	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane
						NTU	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12D	4/15/2022	N	BL02	UMCF	97.1 - 107.1	40.3	<4.07	<4.26	<2.91	29,700,000	63,700 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.417 J	0.374 J	<0.230	<0.237	<0.481 UJ	<0.322	<0.276
U4-MW-12D	9/27/2022	N	EM01	UMCF	97.1 - 107.1	97.6	----	----	----	14,900,000	41,900	<2.94	<2.98	<2.66	<3.16	<2.00	<3.76	<2.84	<4.60	<4.74	<9.62	<6.44	<5.52
U4-MW-12D	10/12/2022	N	EM02	UMCF	97.1 - 107.1	141.7	----	----	----	19,300,000 J	50,700	<0.147	<0.149	<0.133	<0.158	<0.100	0.326 J	0.350 J	<0.230	0.325 J	<0.481	<0.322	<0.276
U4-MW-12D	11/2/2022	N	EM03	UMCF	97.1 - 107.1	84.0	----	----	----	16,600,000	47,900	<1.47	<1.49	<1.33	<1.58	<1.00	<1.88	<1.42	<2.30	<2.37	<4.81	<3.22	<2.76
U4-MW-12D	12/7/2022	N	EM04	UMCF	97.1 - 107.1	89.2	<4.07	<4.26	410	13,400,000	39,900	<0.147	<0.149	<0.133	<0.158	<0.100	0.351 J	0.507 J	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12D	1/12/2023	N	EM05	UMCF	97.1 - 107.1	23.7	----	----	----	14,300,000	39,300	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6
U4-MW-12D	2/15/2023	N	EM06	UMCF	97.1 - 107.1	44.6	----	----	----	13,800,000	37,000 J-	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6
U4-MW-12I	4/14/2022	N	BL02	UMCF	76.8 - 86.8	988.9	<4.07	<4.26	<2.91	8,680,000	21,200	<0.147	<0.149	<0.133	<0.158	<0.100	0.465 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	4/14/2022	FD	BL02	UMCF	76.8 - 86.8	----	<4.07	<4.26	<2.91	8,670,000	19,400	<0.147	<0.149	<0.133	<0.158	<0.100	0.461 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	9/27/2022	N	EM01	UMCF	76.8 - 86.8	70.6	----	----	----	2,360,000	2,880 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	10/12/2022	N	EM02	UMCF	76.8 - 86.8	343.0	----	----	----	2,410,000 J-	2,060	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	11/2/2022	N	EM03	UMCF	76.8 - 86.8	123.8	----	----	----	4,360,000	1,520	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	12/7/2022	N	EM04	UMCF	76.8 - 86.8	20.9	<4.07	<4.26	1,070	1,370,000	<0.150 UJ	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	12/7/2022	FD	EM04	UMCF	76.8 - 86.8	----	<4.07	<4.26	1,110	----	2.33 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	1/13/2023	N	EM05	UMCF	76.8 - 86.8	----	----	----	----	1,580,000	0.446 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-12I	2/15/2023	N	EM06	UMCF	76.8 - 86.8	2.3	----	----	----	3,010,000	<7.50 UJ	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230 UJ	<0.237	<0.481	<0.322	<0.276
U4-MW-13D	4/14/2022	N	BL02	UMCF	98.2 - 108.2	85.7	<4.07	<4.26	<2.91	30,300,000	56,200	<0.147	<0.149	<0.133	<0.158	<0.100	0.565 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13D	9/28/2022	N	EM01	UMCF	98.2 - 108.2	50.9	----	----	----	6,280,000 J+	45,000	<1.47	<1.49	<1.33	<1.58	<1.00	<1.88	<1.42	<2.30	<2.37	<4.81	<3.22	<2.76
U4-MW-13D	10/11/2022	N	EM02	UMCF	98.2 - 108.2	22.7	----	----	----	6,140,000	19,800	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13D	11/3/2022	N	EM03	UMCF	98.2 - 108.2	138.4	----	----	----	9,360,000 J	1,860	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13D	12/7/2022	N	EM04	UMCF	98.2 - 108.2	55.9	<4.07	<4.26	7,020	7,430,000	16,100	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13D	1/12/2023	N	EM05	UMCF	98.2 - 108.2	76.1	----	----	----	5,460,000	15,100	<2.94	<2.98	<2.66	<3.16	<2.00	<3.76	<2.84	<4.60	<4.74	<9.62	<6.44	<5.52
U4-MW-13D	2/15/2023	N	EM06	UMCF	98.2 - 108.2	58.9	----	----	----	6,380,000	15,600 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13I	4/14/2022	N	BL02	UMCF	77.1 - 87.1	2478.1	<4.07	<4.26	<2.91	8,680,000	21,900	<0.147	<0.149	<0.133	<0.158	<0.100	0.403 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13I	9/28/2022	N	EM01	UMCF	77.1 - 87.1	70.5	----	----	----	2,540,000 J+	17,000	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13I	10/10/2022	N	EM02	UMCF	77.1 - 87.1	142.6	----	----	----	2,660,000	8,000	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13I	11/3/2022	N	EM03	UMCF	77.1 - 87.1	119.3	----	----	----	3,340,000 J	5,840 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13I	12/6/2022	N	EM04	UMCF	77.1 - 87.1	94.5	<4.07 UJ	<4.26 UJ	1,300	2,710,000	<0.150 UJ	<0.735 UJ	<0.745 UJ	<0.665 UJ	<0.790 UJ	<0.500 UJ	<0.940 UJ	<0.710 UJ	<1.15 UJ	<1.19 UJ	<2.41 UJ	<1.61 UJ	<1.38 UJ
U4-MW-13I	1/12/2023	N	EM05	UMCF	77.1 - 87.1	118.8	----	----	----	1,960,000	4.48	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-13I	2/14/2023	N	EM06	UMCF	77.1 - 87.1	552.4	----	----	----	3,420,000	0.250 J	<0.735	<0.745	<0.665	<0.790	<0.500	<0.940	<0.710	<1.15	<1.19	<2.41	<1.61	<1.38
U4-MW-14D	4/13/2022	N	BL02	UMCF	97.3 - 107.3	50.4	<4.07	<4.26	<2.91	2,550,000	239	<0.147	<0.149	<0.133	<0.158	<0.100	0.409 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-14D	12/6/2022	N	EM04	UMCF	97.3 - 107.3	58.1	<4.07 UJ	<4.26 UJ	<2.91 UJ	4,530,000	5,860	<0.735 UJ	<0.745 UJ	<0.665 UJ	<0.790 UJ	<0.500 UJ	<0.940 UJ	<0.710 UJ	<1.15 UJ	<1.19 UJ	<2.41 UJ	<1.61 UJ	<1.38 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCF	77.3 - 87.3	57.4	<4.07	<4.26	<2.91	3,220,000	2,270	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-14I	12/6/2022	N	EM04	UMCF	77.3 - 87.3	23.4	<4.07 UJ	<4.26 UJ	29.8	5,260,000	4,360 J-	<0.735 UJ	<0.745 UJ	<0.665 UJ	<0.790 UJ	<0.500 UJ	<0.940 UJ	<0.710 UJ	<1.15 UJ	<1.19 UJ	<2.41 UJ	<1.61 UJ	<1.38 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCF	96.0 - 106.0	76.6	<4.07	<4.26	<2.91	3,490,000	5,240	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-15D	12/5/2022	N	EM04	UMCF	96.0 - 106.0	435.5	<4.07	<4.26	<2.91	2,880,000	3,380 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-15DD	4/13/2022	N	BL02	UMCF	120.3 - 130.3	82.3	<4.07	<4.26	<2.91	677,000	67.5	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-15DD	12/5/2022	N	EM04	UMCF	120.3 - 130.3	51.1	<4.07	<4.26	<2.91	553,000	14.5	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-15I	4/12/2022	N	BL02	UMCF	76.8 - 86.8	20895.7 E	<4.07	<4.26	<2.91	4,080,000	5,010	<0.147	<0.149	<0.133	<0.158	<0.100	0.367 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276
U4-MW-15I	12/5/2022	N	EM04	UMCF	76.8 - 86.8	137.7	<4.07	<4.26	3,490	3,130,000	4,730 J-												

Table 5 Groundwater Analytical Results Unit 4 Source Area Bioremediation Treatability Study

Table with columns: Well, Sample Date, QC Type, Event, Screened Lithology, Screened Interval, and Volatile Organic Compounds by SW8260B (listing 21 compounds: 1,2-Dibromoethane, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene (Mesitylene), 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 2,2-Dichloropropane, 2-Butanone (MEK), 2-Chlorotoluene, 2-Hexanone, 4-Chlorotoluene, 4-Methyl-2-Pentanone, Acetone, Benzene, Bromobenzene, Bromochloromethane).

Table 5
Groundwater Analytical Results
Unit 4 Source Area Bioremediation Treatability Study

Table with columns: Well, Sample Date, QC Type, Event, Screened Lithology, Screened Interval, and Volatile Organic Compounds by SW8260B (including 1,2-Dibromoethane, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 2,2-Dichloropropane, 2-Butanone, 2-Chlorotoluene, 2-Hexanone, 4-Chlorotoluene, 4-Methyl-2-Pentanone, Acetone, Benzene, Bromobenzene, Bromochloromethane).



**Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study**

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene (Mesitylene)	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone (MEK)	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Bromobenzene	Bromochloromethane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12D	4/15/2022	N	BL02	UMCf	97.1 - 107.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.23 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12D	9/27/2022	N	EM01	UMCf	97.1 - 107.1	<2.52	<2.14	<1.64	<2.98	<2.08	<2.20	<2.20	<2.40	<3.22	<23.8	<2.12	<15.7	<2.28	<9.56	<226	<1.88	<2.36	<2.56
U4-MW-12D	10/12/2022	N	EM02	UMCf	97.1 - 107.1	<0.126	<0.107	0.157 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12D	11/2/2022	N	EM03	UMCf	97.1 - 107.1	<1.26	<1.07	<0.819	<1.49	<1.04	<1.10	<1.10	<1.20	<1.61	<11.9	<1.06	<7.87	<1.14	<4.78	<11.3	<0.941	<1.18	<1.28
U4-MW-12D	12/7/2022	N	EM04	UMCf	97.1 - 107.1	<0.126	<0.107	0.196 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12D	1/12/2023	N	EM05	UMCf	97.1 - 107.1	<12.6	<10.7	<8.19	<14.9	<10.4	<11.0	<11.0	<12.0	<16.1	<11.9	<10.6	<78.7	<11.4	<47.8	<1,130	<9.41	<11.8	<12.8
U4-MW-12D	2/15/2023	N	EM06	UMCf	97.1 - 107.1	<12.6	<10.7	<8.19	<14.9	<10.4	<11.0	<11.0	<12.0	<16.1	<11.9	<10.6	<78.7	<11.4	<47.8	<1,130	<9.41	<11.8	<12.8
U4-MW-12I	4/14/2022	N	BL02	UMCf	76.8 - 86.8	<0.126	<0.107	0.144 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.87 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12I	4/14/2022	FD	BL02	UMCf	76.8 - 86.8	<0.126	<0.107	0.146 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	2.86 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12I	9/27/2022	N	EM01	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	13.7 J	<0.0941	<0.118	<0.128
U4-MW-12I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	<0.126	<0.107	0.0834 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12I	11/2/2022	N	EM03	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	10.6 J+	<0.106	<0.787	<0.114	<0.478	16.9 J	<0.0941	<0.118	<0.128
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	10.3 J+	<0.106	<0.787	<0.114	<0.478	16.1 J	<0.0941	<0.118	<0.128
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	9.72 J	<0.106	<0.787	<0.114	<0.478	30.3 J	<0.0941	<0.118	<0.128
U4-MW-12I	2/15/2023	N	EM06	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	24.7 J+	<0.106	<0.787	<0.114	<0.478	23.4 J	<0.0941	<0.118	<0.128
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	<0.126	<0.107	0.200 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	<1.26	<1.07	<0.819	<1.49	<1.04	<1.10	<1.10	<1.20	<1.61	<11.9	<1.06	<7.87	<1.14	<4.78	<11.3	<0.941	<1.18	<1.28
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	14.7	<0.106	<0.787	<0.114	<0.478	66.9	<0.0941	<0.118	<0.128
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	2.69 J	<0.106	<0.787	<0.114	<0.478	15.0 J	<0.0941	<0.118	<0.128
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	<2.52	<2.14	<1.64	<2.98	<2.08	<2.20	<2.20	<2.40	<3.22	<23.8	<2.12	<15.7	<2.28	<9.56	<226	<1.88	<2.36	<2.56
U4-MW-13D	2/15/2023	N	EM06	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	<0.126	<0.107	0.133 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.157 J	<0.118	<0.128
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.81 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	<0.630 UJ	<0.535 UJ	<0.409 UJ	<0.745 UJ	<0.520 UJ	<0.550 UJ	<0.550 UJ	<0.600 UJ	<0.805 UJ	19.1 J	<0.530 UJ	<3.94 UJ	<0.570 UJ	<2.39 UJ	<56.5 UJ	<0.471 UJ	<0.590 UJ	<0.640 UJ
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	20.5 J+	<0.106	<0.787	<0.114	<0.478	16.9 J	<0.0941	<0.118	<0.128
U4-MW-13I	2/14/2023	N	EM06	UMCf	77.1 - 87.1	<0.630	<0.535	<0.409	<0.745	<0.520	<0.550	<0.550	<0.600	<0.805	17.5 J	<0.530	<3.94	<0.570	<2.39	<56.5	0.558 J	<0.590	<0.640
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	<0.126	<0.107	0.134 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	<0.630 UJ	<0.535 UJ	<0.409 UJ	<0.745 UJ	<0.520 UJ	<0.550 UJ	<0.550 UJ	<0.600 UJ	<0.805 UJ	<5.95 UJ	<0.530 UJ	<3.94 UJ	<0.570 UJ	<2.39 UJ	<56.5 UJ	<0.471 UJ	<0.590 UJ	<0.640 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<0.630 UJ	<0.535 UJ	<0.409 UJ	<0.745 UJ	<0.520 UJ	<0.550 UJ	<0.550 UJ	<0.600 UJ	<0.805 UJ	<5.95 UJ	<0.530 UJ	<3.94 UJ	<0.570 UJ	<2.39 UJ	<56.5 UJ	<0.471 UJ	<0.590 UJ	<0.640 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.09		

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																			
						Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Diisopropyl Ether (DIPE)	Ethyl Tert-Butyl Ether (ETBE)	Ethylbenzene	Hexachlorobutadiene			
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
M-247-100	4/20/2022	N	BL02	UMCF	100.5 - 110.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-249-100	4/20/2022	N	BL02	UMCF	99.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-251-100	4/19/2022	N	BL02	UMCF	92.5 - 102.5	13.1	8.80	<0.605	<0.128	<0.116	<0.192	8.010	<0.960	<0.126	<0.111	6.51	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
M-251-100	10/13/2022	N	EM02	UMCF	92.5 - 102.5	6.92	3.40	<0.605	<0.128	<0.116	<0.192	3.950	<0.960	<0.126	<0.111	3.91	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
M-251-100	11/2/2022	N	EM03	UMCF	92.5 - 102.5	5.61 J	<1.29	<6.05	<1.28	<1.16	<1.92	2,420	<9.60	<1.26	<1.11	2.27 J	<1.22	<3.74	<1.05	<1.01	<1.37	<3.37	<3.37	<3.37	
M-251-100	12/8/2022	N	EM04	UMCF	92.5 - 102.5	4.81	1.77	<0.605	1.55	<0.116	<0.192	2,240	<0.960	<0.126	<0.111	2.75	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
M-251-100	1/11/2023	N	EM05	UMCF	92.5 - 102.5	4.88	1.80	<0.605	<0.128	<0.116	<0.192	2,680	<0.960	<0.126	<0.111	2.88	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
M-251-100	2/13/2023	N	EM06	UMCF	92.5 - 102.5	4.13	1.02	<0.605	1.37	<0.116	<0.192	1,480	<0.960	<0.126	<0.111	2.53	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337 UJ	<0.337	<0.337	
M-251-60	4/18/2022	N	BL02	UMCF	52.3 - 62.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	13.5	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
M-252	4/21/2022	N	BL02	UMCF	132.3 - 142.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	0.192 J	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
M-253-100	4/20/2022	N	BL02	UMCF	100.8 - 110.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-255-100	4/20/2022	N	BL02	UMCF	100.2 - 110.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
U4-E-01D	4/18/2022	N	BL02	UMCF	94.7 - 109.7	5.46	9.81 J	<3.03	<0.640	<0.580	<0.960	6,650	<4.80	<0.630	<0.555	4.26 J	<0.610	<1.87	<0.525	<0.505	<0.685	<1.69	<1.69	<1.69	
U4-E-01I	4/19/2022	N	BL02	UMCF	74.6 - 89.6	0.521 J	0.388 J	<0.605	<0.128	<0.116	<0.192	186 J	<0.960	<0.126	<0.111	0.328 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-01I	4/19/2022	FD	BL02	UMCF	74.6 - 89.6	0.509 J	<0.129	<0.605	<0.128	<0.116	<0.192	280 J	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-02D	4/20/2022	N	BL02	UMCF	94.4 - 109.4	3.33 J+	1.82	<0.605	<0.128	<0.116	<0.192	1,660	<0.960	<0.126	<0.111	1.39	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-02I	4/18/2022	N	BL02	UMCF	74.4 - 89.4	1.65	1.65	<0.605	<0.128	<0.116	<0.192	727	<0.960	<0.126	<0.111	0.956 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-03D	4/19/2022	N	BL02	UMCF	95.1 - 110.1	10.9	6.45	<0.605	<0.128	<0.116	<0.192	6,390	<0.960	<0.126	<0.111	4.96	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-03D	10/13/2022	N	EM02	UMCF	95.1 - 110.1	<27.2	<25.8	<121	<25.6	<23.2	<38.4	4,280	<192	<25.2	<22.2	<28.0	<24.4	<74.8	<21.0	<20.2	<27.4	<67.4	<67.4	<67.4	
U4-E-03D	11/3/2022	N	EM03	UMCF	95.1 - 110.1	9.37	4.31	<0.605	2.75	<0.116	<0.192	4,350	<0.960	<0.126	<0.111	5.14 J+	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-03D	12/6/2022	N	EM04	UMCF	95.1 - 110.1	7.65 J	3.37 J	<12.1 UJ	6.86 J	<2.32 UJ	<3.84 UJ	3,470	<19.2 UJ	<2.52 UJ	<2.22 UJ	3.45 J	<2.44 UJ	<7.48 UJ	<2.10 UJ	<2.02 UJ	<2.74 UJ	<6.74 UJ	<6.74 UJ	<6.74 UJ	
U4-E-03D	1/9/2023	N	EM05	UMCF	95.1 - 110.1	7.40	2.90	<0.605	2.25	<0.116	<0.192	3,520	<0.960	<0.126	<0.111	3.66	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-03D	2/13/2023	N	EM06	UMCF	95.1 - 110.1	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	3,130	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7	<33.7	<33.7	
U4-E-04D	4/19/2022	N	BL02	UMCF	95.0 - 110.0	2.28	0.947 J	<0.605	<0.128	<0.116	<0.192	2,980	<0.960	<0.126	<0.111	0.812 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-04I	4/18/2022	N	BL02	UMCF	75.0 - 90.0	0.591 J	<0.129	<0.605	<0.128	<0.116	<0.192	433	<0.960	<0.126	<0.111	0.141 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-05D	4/19/2022	N	BL02	UMCF	95.0 - 110.0	4.11	3.20	<0.605	<0.128	<0.116	<0.192	3,780	<0.960	<0.126	<0.111	2.06	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-05I	4/19/2022	N	BL02	UMCF	75.0 - 90.0	1.41	1.99	<0.605	<0.128	<0.116	<0.192	516	<0.960	<0.126	<0.111	0.948 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-06D	4/11/2022	N	BL02	UMCF	95.1 - 110.1	0.502 J	0.185 J	<0.605	<0.128	<0.116	<0.192	819	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-06I	4/11/2022	N	BL02	UMCF	73.2 - 88.2	0.679 J	<0.129	<0.605	<0.128	<0.116	<0.192	218	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-06I	4/11/2022	FD	BL02	UMCF	73.2 - 88.2	0.605 J	<0.129	<0.605	<0.128	<0.116	<0.192	215	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-06I	10/12/2022	N	EM02	UMCF	73.2 - 88.2	1.58	0.258 J	<0.605	1.14	<0.116	<0.192	<0.111	<0.960	<0.126	<0.111	0.447 J	<0.122	<0.374	<0.105	4.56	<0.137	<0.337	<0.337	<0.337	
U4-E-06I	11/3/2022	N	EM03	UMCF	73.2 - 88.2	1.16 J+	0.235 J	<0.605	0.654 J	<0.116	<0.192	1,740	<0.960	<0.126	<0.111	0.414 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-06I	12/6/2022	N	EM04	UMCF	73.2 - 88.2	<1.36 UJ	<1.29 UJ	<6.05 UJ	2.80 J	<1.16 UJ	<1.92 UJ	1,080	<9.60 UJ	<1.26 UJ	<1.11 UJ	<1.40 UJ	<1.22 UJ	<3.74 UJ	<1.05 UJ	<1.01 UJ	<1.37 UJ	<3.37 UJ	<3.37 UJ	<3.37 UJ	
U4-E-06I	1/9/2023	N	EM05	UMCF	73.2 - 88.2	1.18	0.386 J	<0.605	0.877 J	<0.116	<0.192	2,050	<0.960	<0.126	<0.111	0.412 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-06I	2/13/2023	N	EM06	UMCF	73.2 - 88.2	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	1,730	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7	<33.7	<33.7	
U4-E-07D	4/12/2022	N	BL02	UMCF	94.6 - 109.6	3.05	1.20	<0.605	2.62	<0.116	<0.192	5,980	<0.960	<0.126	<0.111	1.08	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-07I	4/12/2022	N	BL02	UMCF	74.7 - 89.7	1.21	0.866 J	<0.605	1.03	<0.116	<0.192	1,140	<0.960	<0.126	<0.111	0.715 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-07I	10/11/2022	N	EM02	UMCF	74.7 - 89.7	2.84 J	<1.29	<6.05	5.80 J	<1.16	<1.92	3,920	<9.60	<1.26	<1.11	<1.40	<1.22	<3.74	<1.05	<1.01	<1.37	<3.37	<3.37	<3.37	
U4-E-07I	11/3/2022	N	EM03	UMCF	74.7 - 89.7	4.41	1.98 J+	<0.605	1.58	<0.116	<0.192	3,510	<0.960	<0.126	<0.111	2.14 J+	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-07I	12/6/2022	N	EM04	UMCF	74.7 - 89.7	4.68 J	<3.22 UJ	<15.1 UJ	8.58 J	<2.90 UJ	<4.80 UJ	4,200	<24.0 UJ	<3.15 UJ	<2.78 UJ	<3.50 UJ	<3.05 UJ	<9.35 UJ	<2.63 UJ	<2.53 UJ	<3.43 UJ	<8.43 UJ	<8.43 UJ	<8.43 UJ	
U4-E-07I	1/9/2023	N	EM05	UMCF	74.7 - 89.7	4.48	1.88	<0.605	1.92	<0.116	<0.192	3,840	<0.960	<0.126	<0.111	2.24	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337	<0.337	<0.337	
U4-E-07I	2/13/2023	N	EM06	UMCF	74.7 - 89.7	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	3,670	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7	<33.7	<33.7	
U4-E-08D	4/12/2022	N	BL02	UMCF	94.6 - 109.6	2.74	0.954 J	<0.605	2.96	<0.116	<0.192	7,120	<0.960	<0.126	<0.111	1.00 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337			

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																
						Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Diisopropyl Ether (DIPE)	Ethyl Tert-Butyl Ether (ETBE)	Ethylbenzene	Hexachlorobutadiene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-03I	4/19/2022	N	BL02	UMCf	76.6 - 86.6	0.846 J	0.580 J	<0.605	<0.128	<0.116	<0.192	277	<0.960	<0.126	<0.111	0.457 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-03S	4/18/2022	N	BL02	UMCf	54.5 - 64.5	0.176 J	<0.129	<0.605	<0.128	<0.116	<0.192	45.1	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-03S	4/18/2022	FD	BL02	UMCf	54.5 - 64.5	0.182 J	<0.129	<0.605	<0.128	<0.116	<0.192	44.1	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-04D	4/19/2022	N	BL02	UMCf	97.0 - 107.0	4.27	1.46	<0.605	<0.128	<0.116	<0.192	6,140	<0.960	<0.126	<0.111	1.42	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-04D	2/16/2023	N	EM06	UMCf	97.0 - 107.0	<6.80	<6.45	<30.3	<6.40	<5.80	<9.60	1,240	<48.0	<6.30	<5.55	<7.00	<6.10	<18.7	<5.25	<5.05	<6.85	<16.9
U4-MW-04I	4/19/2022	N	BL02	UMCf	76.8 - 86.8	1.86	0.968 J	<0.605	<0.128	<0.116	<0.192	1,830	<0.960	<0.126	<0.111	0.749 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05D	4/15/2022	N	BL02	UMCf	98.2 - 108.2	14.8	8.45 J	<0.605	<0.128	<0.116	<0.192	6,320	<0.960	<0.126	<0.111	7.16	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	5,350	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	11.3	5.15	<0.605	1.89	<0.116	<0.192	3,790	<0.960	<0.126	<0.111	6.10	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	12.9	6.25	<0.605	<0.128	<0.116	<0.192	3,950	<0.960	<0.126	<0.111	6.85	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	11.2	5.71	<0.605	<0.128	<0.116	<0.192	3,990	<0.960	<0.126	<0.111	5.60	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05D	2/14/2023	N	EM06	UMCf	98.2 - 108.2	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	2,590	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7
U4-MW-05I	4/15/2022	N	BL02	UMCf	76.6 - 86.6	9.46	5.71 J	<0.605	2.53	<0.116	<0.192	3,530	<0.960	<0.126	<0.111	4.75	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	5,930	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	15.2	8.95	<0.605	3.70	<0.116	<0.192	5,800	<0.960	<0.126	<0.111	7.90	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	14.5	8.16	<0.605	3.07	<0.116	<0.192	3,970	<0.960	<0.126	<0.111	6.57	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	12.4	6.41	<0.605	2.70	<0.116	<0.192	4,040	<96.0	<0.126	<0.111	6.99	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-05I	2/14/2023	N	EM06	UMCf	76.6 - 86.6	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	3,270	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7
U4-MW-06D	4/19/2022	N	BL02	UMCf	97.1 - 107.1	10.0	5.10	<0.605	<0.128	<0.116	<0.192	4,840	<0.960	<0.126	<0.111	3.82	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-06D	2/15/2023	N	EM06	UMCf	97.1 - 107.1	<6.80	<6.45	<30.3	<6.40	<5.80	<9.60	2,110	<48.0	<6.30	<5.55	<7.00	<6.10	<18.7	<5.25	<5.05	<6.85	<16.9
U4-MW-06I	4/19/2022	N	BL02	UMCf	76.5 - 86.5	0.674 J	0.297 J	<0.605	<0.128	<0.116	<0.192	217	<0.960	<0.126	<0.111	0.273 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	4/15/2022	N	BL02	UMCf	96.8 - 106.5	1.13	0.515 J	<0.605	0.461 J	0.137 J	<0.192	1,330	<0.960	<0.126	<0.111	0.410 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	3.77	0.211 J	<0.605	0.373 J	<0.116	<0.192	113	<0.960	<0.126	<0.111	2.38	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	2.98	0.201 J	<0.605	<0.128	<0.116	<0.192	95.5	<0.960	<0.126	<0.111	1.83	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	3.76	0.280 J	<0.605	<0.128	<0.116	<0.192	146	<0.960	<0.126	<0.111	2.53 J+	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	3.77	0.338 J	<0.605	<0.128	<0.116	<0.192	101	<0.960	<0.126	<0.111	2.25	0.240 J	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	2.84	<0.129	<0.605	<0.128	<0.116	<0.192	119	<0.960	<0.126	<0.111	1.21	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07D	2/14/2023	N	EM06	UMCf	96.8 - 106.5	1.38	<0.129	<0.605	<0.128	<0.116	<0.192	92.3	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07I	4/15/2022	N	BL02	UMCf	76.8 - 86.8	0.676 J	0.206 J	<0.605	0.313 J	<0.116	<0.192	373	<0.960	<0.126	<0.111	0.189 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	5.11	0.403 J	<0.605	0.425 J	<0.116	<0.192	164	<0.960	<0.126	<0.111	3.22	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	3.61	0.321 J	<0.605	<0.128	<0.116	<0.192	153	<0.960	<0.126	<0.111	2.52 J+	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	4.08	0.353 J	<0.605	<0.128	<0.116	<0.192	129	<0.960	<0.126	<0.111	2.47	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	2.79	0.162 J	<0.605	<0.128	<0.116	<0.192	154	<4.80	<0.126	<0.111	1.11	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-07I	2/15/2023	N	EM06	UMCf	76.8 - 86.8	1.57	0.149 J	<0.605	<0.128	<0.116	<0.192	180	<0.960	<0.126	<0.111	0.700 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08D	4/13/2022	N	BL02	UMCf	98.6 - 108.6	<0.136	0.452 J	<0.605	<0.128	<0.116	<0.192	10,300 J+	<0.960	<0.126	<0.111	0.370 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	3.42	0.921 J	<0.605	1.85	<0.116	<0.192	4,240	<0.960	<0.126	<0.111	1.82	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08DD	4/20/2022	N	BL02	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	90.2	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08DD	4/20/2022	FD	BL02	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	85.4	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	28.1	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08I	4/13/2022	N	BL02	UMCf	78.0 - 88.0	5.72	2.19	<0.605	2.14	<0.116	<0.192	1,100 J+	<0.960	<0.126	<0.111	1.76	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	2.33	1.08	<0.605	1.46	<0.116	<0.192	2,660	<0.960	<0.126	<0.111	1.02	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	2.52	1.14	<0.605	1.40	<0.116	<0.192	2,560	<0.960	<0.126	<0.111	1.05	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08S	4/15/2022	N	BL02	UMCf	54.9 - 64.9	0.213 J	<0.129 UJ	<0.605	<0.128	<0.116	<0.192	38.2	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08S	12/7/2022	N	EM04	UMCf	54.9 - 64.9	0.290 J	<0.129	<0.605	<0.128	<0.116	<0.192	15.0	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-08S	12/7/2022	FD	EM04	UMCf	54.9 - 64.9	0.275 J	<0.129	<0.605	<0.128	<0.116	<0.192	15.4	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374				

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																
						Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Diisopropyl Ether (DIPE)	Ethyl Tert-Butyl Ether (ETBE)	Ethylbenzene	Hexachlorobutadiene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12D	4/15/2022	N	BL02	UMCF	97.1 - 107.1	2.15	0.934 J	<0.605	1.81	<0.116	<0.192	4,690	<0.960	<0.126	<0.111	0.664 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12D	9/27/2022	N	EM01	UMCF	97.1 - 107.1	<2.72	<2.58	<12.1	<2.56	<2.32	<3.84	4,030 J	<19.2	<2.52	<2.22	<2.80	<2.44	<7.48	<2.10	<2.02	<2.74	<6.74
U4-MW-12D	10/12/2022	N	EM02	UMCF	97.1 - 107.1	1.59	0.380 J	<0.605	1.63	<0.116	<0.192	<0.111	<0.960	<0.126	<0.111	0.454 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12D	11/2/2022	N	EM03	UMCF	97.1 - 107.1	<1.36	<1.29	<6.05	<1.28	<1.16	<1.92	3,140	<9.60	<1.26	<1.11	<1.40	<1.22	<3.74	<1.05	<1.01	<1.37	<3.37
U4-MW-12D	12/7/2022	N	EM04	UMCF	97.1 - 107.1	1.96	0.515 J	<0.605	<0.128	<0.116	<0.192	3,560	<0.960	<0.126	<0.111	0.535 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12D	1/12/2023	N	EM05	UMCF	97.1 - 107.1	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	3,260	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7
U4-MW-12D	2/15/2023	N	EM06	UMCF	97.1 - 107.1	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	2,520	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7	<33.7
U4-MW-12I	4/14/2022	N	BL02	UMCF	76.8 - 86.8	1.28	0.688 J	<0.605	0.961 J	<0.116	<0.192	1,670	<0.960	<0.126	<0.111	0.610 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	4/14/2022	FD	BL02	UMCF	76.8 - 86.8	1.16	0.609 J	<0.605	0.812 J	<0.116	<0.192	1,640	<0.960	<0.126	<0.111	0.573 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	9/27/2022	N	EM01	UMCF	76.8 - 86.8	0.456 J	<0.129	<0.605	0.351 J	<0.116	<0.192	231	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	10/12/2022	N	EM02	UMCF	76.8 - 86.8	0.344 J	<0.129 UJ	<0.605	0.486 J	<0.116	<0.192	194	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	11/2/2022	N	EM03	UMCF	76.8 - 86.8	0.236 J	<0.129	<0.605	<0.128	<0.116	<0.192	182	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	12/7/2022	N	EM04	UMCF	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	91.3	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	12/7/2022	FD	EM04	UMCF	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	90.0	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	1/13/2023	N	EM05	UMCF	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	36.5	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-12I	2/15/2023	N	EM06	UMCF	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	36.5	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13D	4/14/2022	N	BL02	UMCF	98.2 - 108.2	1.63	0.706 J	<0.605	1.11	<0.116	<0.192	3,460	<0.960	<0.126	<0.111	0.639 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13D	9/28/2022	N	EM01	UMCF	98.2 - 108.2	<1.36	<1.29	<6.05	<1.28	<1.16	<1.92	1,270	<9.60	<1.26	<1.11	<1.40	<1.22	<3.74	<1.05	<1.01	<1.37	<3.37
U4-MW-13D	10/11/2022	N	EM02	UMCF	98.2 - 108.2	0.628 J	<0.129	<0.605	<0.128	<0.116	<0.192	983	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13D	11/3/2022	N	EM03	UMCF	98.2 - 108.2	1.01 J+	0.198 J	<0.605	0.415 J	<0.116	<0.192	1,060	<0.960	<0.126	<0.111	0.551 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13D	12/7/2022	N	EM04	UMCF	98.2 - 108.2	1.83	0.233 J	<0.605	<0.128	<0.116	<0.192	874	<0.960	<0.126	<0.111	1.04	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13D	1/12/2023	N	EM05	UMCF	98.2 - 108.2	<2.72	<2.58	837	<12.1	<2.32	<3.84	837	<19.2	<2.52	<2.22	<2.80	<2.44	<7.48	<2.10	<2.02	<2.74	<6.74
U4-MW-13D	2/15/2023	N	EM06	UMCF	98.2 - 108.2	2.28	<0.129	<0.605	<0.128	<0.116	<0.192	729	<0.960	<0.126	<0.111	1.12	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13I	4/14/2022	N	BL02	UMCF	77.1 - 87.1	1.18	0.624 J	<0.605	0.865 J	<0.116	<0.192	1,350	<0.960	<0.126	<0.111	0.618 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13I	9/28/2022	N	EM01	UMCF	77.1 - 87.1	0.584 J	<0.129	<0.605	0.400 J	<0.116	<0.192	154 J-	<0.960	<0.126	<0.111	0.164 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13I	10/10/2022	N	EM02	UMCF	77.1 - 87.1	0.505 J	<0.129	<0.605	0.759 J	<0.116	<0.192	451	<0.960	0.394 J	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13I	11/3/2022	N	EM03	UMCF	77.1 - 87.1	0.580 J	<0.129	<0.605	0.426 J	<0.116	<0.192	441	<0.960	<0.126	<0.111	0.159 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13I	12/6/2022	N	EM04	UMCF	77.1 - 87.1	<0.680 UJ	<0.645 UJ	<3.03 UJ	<0.640 UJ	<0.580 UJ	<0.960 UJ	305	<4.80 UJ	<0.630 UJ	<0.555 UJ	<0.700 UJ	<0.610 UJ	<1.87 UJ	<0.525 UJ	<0.505 UJ	<0.685 UJ	<1.69 UJ
U4-MW-13I	1/12/2023	N	EM05	UMCF	77.1 - 87.1	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	236	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-13I	2/14/2023	N	EM06	UMCF	77.1 - 87.1	<0.680	<0.645	<3.03	<0.640	<0.580	<0.960	373	<4.80	<0.630	<0.555	<0.700	<0.610	<1.87	<0.525	<0.505	<0.685	<1.69
U4-MW-14D	4/13/2022	N	BL02	UMCF	97.3 - 107.3	0.920 J	0.628 J	<0.605	0.805 J	<0.116	<0.192	110 J	<0.960	<0.126	<0.111	0.561 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-14D	12/6/2022	N	EM04	UMCF	97.3 - 107.3	1.17 J	<0.645 UJ	<3.03 UJ	1.27 J	<0.580 UJ	<0.960 UJ	287	<4.80 UJ	<0.630 UJ	<0.555 UJ	0.751 J	<0.610 UJ	<1.87 UJ	<0.525 UJ	<0.505 UJ	<0.685 UJ	<1.69 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCF	77.3 - 87.3	0.557 J	<0.605	0.537 J	<0.605	<0.116	<0.192	157	<0.960	<0.126	<0.111	0.471 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-14I	12/6/2022	N	EM04	UMCF	77.3 - 87.3	<0.680 UJ	<0.645 UJ	<3.03 UJ	1.27 J	<0.580 UJ	<0.960 UJ	212	<4.80 UJ	<0.630 UJ	<0.555 UJ	<0.700 UJ	<0.610 UJ	<1.87 UJ	<0.525 UJ	<0.505 UJ	<0.685 UJ	<1.69 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCF	96.0 - 106.0	0.402 J	<0.129	<0.605	<0.128	<0.116	<0.192	407 J+	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15D	12/5/2022	N	EM04	UMCF	96.0 - 106.0	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	165	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15DD	4/13/2022	N	BL02	UMCF	120.3 - 130.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	13.2 J+	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15DD	12/5/2022	N	EM04	UMCF	120.3 - 130.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	0.237 J	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15I	4/12/2022	N	BL02	UMCF	76.8 - 86.8	0.609 J	0.428 J	<0.605	0.809 J	<0.116	<0.192	705	<0.960	<0.126	<0.111	0.447 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15I	12/5/2022	N	EM04	UMCF	76.8 - 86.8	0.582 J	<0.129	<0.605	0.371 J	<0.116	<0.192	758	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15S	4/13/2022	N	BL02	UMCF	54.8 - 64.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	9.07 J+	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-15S	12/5/2022	N	EM04	UMCF	54.8 - 64.8	<3.40	<3.22	<15.1	<3.20	<2.90	<4.80	8.04 J	<24.0	<3.15	<2.78	<3.50	<3.05	<9.35	<2.63	<2.53	<3.43	<8.43
U4-MW-16D	4/11/2022	N	BL02	UMCF	96.8 - 106.8	1.91	0.510 J	<0.605	<0.128	<0.116	<0.192	3,310	<0.960	<0.126	<0.111	0.533 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-16D	12/5/2022	N	EM04	UMCF	96.8 - 106.8	0.840 J	0.281 J	<0.605	0.646 J	<0.116	<0.192	2,020	<0.960	<0.126	<0.111	0.216 J	<0.122	<0.374	<0.105	<0.101	<0.137	<0.337
U4-MW-16DD	4/12/2022	N	BL02	UMCF	120.8 - 130.8	<0.136	<0															

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						Isopropylbenzene	m,p-Xylene (Sum of Isomers)	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	p-Cymene (p-Isopropyltoluene)	sec-Butylbenzene	Styrene	tert-Amyl Methyl Ether	tert-Butyl Alcohol	tert-Butyl Methyl Ether (MTBE)	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
M-247-100	4/20/2022	N	BL02	UMCf	100.5 - 110.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-249-100	4/20/2022	N	BL02	UMCf	99.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-251-100	4/19/2022	N	BL02	UMCf	92.5 - 102.5	<0.105	<0.430	1.11 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	10/13/2022	N	EM02	UMCf	92.5 - 102.5	<0.105	<0.430	0.845 J	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	12.5 J+	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	11/2/2022	N	EM03	UMCf	92.5 - 102.5	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
M-251-100	12/8/2022	N	EM04	UMCf	92.5 - 102.5	<0.105	<0.430	0.576 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	1/11/2023	N	EM05	UMCf	92.5 - 102.5	<0.105	<0.430	0.536 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	2/13/2023	N	EM06	UMCf	92.5 - 102.5	<0.105	<0.430	0.475 J	<1.00	<0.157 UJ	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-60	4/18/2022	N	BL02	UMCf	52.3 - 62.3	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-252	4/21/2022	N	BL02	UMCf	132.3 - 142.3	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.292 J	<0.149	<0.118
M-253-100	4/20/2022	N	BL02	UMCf	100.8 - 110.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-255-100	4/20/2022	N	BL02	UMCf	100.2 - 110.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
U4-E-01D	4/18/2022	N	BL02	UMCf	94.7 - 109.7	<0.525	<2.15	<2.15	<5.00	<0.785 UJ	<0.497	<0.870	<0.600	<0.625	<0.590 UJ	<0.975	<20.3 UJ	<0.505	<0.635	<1.50	<1.39	<0.745	<0.590
U4-E-01I	4/19/2022	N	BL02	UMCf	74.6 - 89.6	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.58	<0.101	<0.127	<0.300	0.471 J	<0.149	<0.118
U4-E-01I	4/19/2022	FD	BL02	UMCf	74.6 - 89.6	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.05	<0.101	<0.127	<0.300	0.330 J	<0.149	<0.118
U4-E-02D	4/20/2022	N	BL02	UMCf	94.4 - 109.4	<0.105	<0.430	0.478 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.644 J	<0.149	<0.118
U4-E-02I	4/18/2022	N	BL02	UMCf	74.4 - 89.4	<0.105	<0.430 UJ	<0.430	<1.00 UJ	<0.157 UJ	<0.0993 UJ	<0.174 UJ	<0.120	<0.125 UJ	<0.118 R	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-03D	4/19/2022	N	BL02	UMCf	95.1 - 110.1	<0.105	<0.430	0.797 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.74	<0.101	<0.127	<0.300	0.333 J	<0.149	<0.118
U4-E-03D	10/13/2022	N	EM02	UMCf	95.1 - 110.1	<21.0	<86.0	<86.0	<200 UJ	<31.4	<19.9	<34.8	<24.0	<25.0	<23.6	<39.0	<34.2	<20.2	<25.4	<60.0	<55.6	<29.8	<23.6
U4-E-03D	11/3/2022	N	EM03	UMCf	95.1 - 110.1	<0.105	<0.430	0.543 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.494 J	<0.278	<0.149	<0.118
U4-E-03D	12/6/2022	N	EM04	UMCf	95.1 - 110.1	<2.10 UJ	<8.60 UJ	<8.60 UJ	<20.0 UJ	<3.14 UJ	<1.99 UJ	<3.48 UJ	<2.40 UJ	<2.50 UJ	<2.36 UJ	<3.90 UJ	<81.2 UJ	<2.02 UJ	<2.54 UJ	<6.00 UJ	<5.56 UJ	<2.98 UJ	<2.36 UJ
U4-E-03D	1/9/2023	N	EM05	UMCf	95.1 - 110.1	<0.105	<0.430	0.516 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.342 J	<0.278	<0.149	<0.118
U4-E-03D	2/13/2023	N	EM06	UMCf	95.1 - 110.1	<10.5	<43.0	<43.0	<100	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<40.6	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-E-04D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.71	<0.101	<0.127	<0.300	0.341 J	<0.149	<0.118
U4-E-04I	4/18/2022	N	BL02	UMCf	75.0 - 90.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.31 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-05D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.513 J	<0.149	<0.118
U4-E-05I	4/19/2022	N	BL02	UMCf	75.0 - 90.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06D	4/11/2022	N	BL02	UMCf	95.1 - 110.1	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118 R	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06I	4/11/2022	N	BL02	UMCf	73.2 - 88.2	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06I	4/11/2022	FD	BL02	UMCf	73.2 - 88.2	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06I	10/12/2022	N	EM02	UMCf	73.2 - 88.2	<0.105	<0.430	0.976 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.450 J	<0.278	<0.149	<0.118
U4-E-06I	11/3/2022	N	EM03	UMCf	73.2 - 88.2	<0.105	<0.430	2.60 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.389 J	<0.278	<0.149	<0.118
U4-E-06I	12/6/2022	N	EM04	UMCf	73.2 - 88.2	<1.05 UJ	<4.30 UJ	6.34 J	<10.0 UJ	<1.57 UJ	<0.993 UJ	<1.74 UJ	<1.20 UJ	<1.25 UJ	<1.18 UJ	<1.95 UJ	<40.6 UJ	<10.1 UJ	<12.7 UJ	<3.00 UJ	<2.78 UJ	<1.49 UJ	<1.18 UJ
U4-E-06I	1/9/2023	N	EM05	UMCf	73.2 - 88.2	<0.105	<0.430	2.99 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.300 J	<0.278	<0.149	<0.118
U4-E-06I	2/13/2023	N	EM06	UMCf	73.2 - 88.2	<10.5	<43.0	<43.0	<100	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<40.6	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-E-07D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<0.105	<0.430	0.637 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.41 J	<0.101	<0.127	<0.300	3.53	<0.149	<0.118
U4-E-07I	4/12/2022	N	BL02	UMCf	74.7 - 89.7	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	13.0	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-07I	10/11/2022	N	EM02	UMCf	74.7 - 89.7	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<10.1	<12.7	<3.00	<2.78	<1.49	<1.18
U4-E-07I	11/3/2022	N	EM03	UMCf	74.7 - 89.7	<0.105	<0.430	2.44 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.397 J	<0.278	<0.149	<0.118
U4-E-07I	12/6/2022	N	EM04	UMCf	74.7 - 89.7	<2.63 UJ	<10.7 UJ	<10.7 UJ	<25.0 UJ	<3.93 UJ	<2.48 UJ	<4.35 UJ	<3.00 UJ	<3.13 UJ	<2.95 UJ	<4.88 UJ	<102 UJ	<2.53 UJ	<3.18 UJ	<7.50 UJ	<6.95 UJ	<3.73 UJ	<2.95 UJ
U4-E-07I	1/9/2023	N	EM05	UMCf	74.7 - 89.7	<0.105	<0.430	0.747 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.370 J	<0.278	<0.149	<0.118
U4-E-07I	2/13/2023	N	EM06	UMCf	74.7 - 89.7	<10.5	<43.0	<43.0	<100	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<40.6	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-E-08D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<0.105	<0.430	0.819 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.12	<0.101	<0.127	<0.300	1.49	<0.149	<0.118
U4-E-08D	10/11/2022	N	EM02	UMCf	94.6 - 109.6	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<									

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						Isopropylbenzene	m,p-Xylene (Sum of Isomers)	Methylene Chloride	Naphthalene	n- Butylbenzene	n- Propylbenzene	o-Xylene	p-Cymene (p- Isopropyltoluene)	sec- Butylbenzene	Styrene	tert-Amyl Methyl Ether	tert-Butyl Alcohol	tert-Butyl Methyl Ether (MTBE)	tert- Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2- Dichloroethene	trans-1,3- Dichloropropene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-03I	4/19/2022	N	BL02	UMCf	76.6 - 86.6	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.28 J	<0.101	<0.127	<0.300	0.798 J	<0.149	<0.118
U4-MW-03S	4/18/2022	N	BL02	UMCf	54.5 - 64.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-03S	4/18/2022	FD	BL02	UMCf	54.5 - 64.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-04D	4/19/2022	N	BL02	UMCf	97.0 - 107.0	<0.105	<0.430	<0.856 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.59	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-04D	2/16/2023	N	EM06	UMCf	97.0 - 107.0	<5.25	<21.5	<21.5	<50.0	<7.85	<4.97 UJ	<8.70	<6.00	<6.25	<5.90	<9.75	<203	<5.05	<6.35	<15.0	<13.9	<7.45	<5.90
U4-MW-04I	4/19/2022	N	BL02	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	10.8	<0.101	<0.127	<0.300	0.375 J	<0.149	<0.118
U4-MW-05D	4/15/2022	N	BL02	UMCf	98.2 - 108.2	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	<10.5	<43.0	<43.0	<100 UJ	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.105	<0.430	0.767 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.34	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	<0.105	<0.430	0.566 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05D	2/14/2023	N	EM06	UMCf	98.2 - 108.2	<10.5	<43.0	<43.0	<100	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-05I	4/15/2022	N	BL02	UMCf	76.6 - 86.6	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	<10.5	<43.0	<43.0	<100 UJ	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	<0.105	<0.430	0.570 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.354 J	<0.278	<0.149	<0.118
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	<0.105	<0.430	0.635 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	<0.105	<0.430	0.474 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.331 J	<0.278	<0.149	<0.118
U4-MW-05I	2/14/2023	N	EM06	UMCf	76.6 - 86.6	<10.5	<43.0	<43.0	<100	<15.7	<9.93 UJ	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-06D	4/19/2022	N	BL02	UMCf	97.1 - 107.1	<0.105	<0.430	1.58 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-06D	2/15/2023	N	EM06	UMCf	97.1 - 107.1	<5.25	<21.5	<21.5	<50.0 UJ	<7.85	<4.97	<8.70	<6.00	<6.25	<5.90	<9.75 UJ	<203	<5.05	<6.35	<15.0	<13.9	<7.45	<5.90
U4-MW-06I	4/19/2022	N	BL02	UMCf	76.5 - 86.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.332 J	<0.149	<0.118
U4-MW-07D	4/15/2022	N	BL02	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.04 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	0.181 J	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.557 J	<0.149	<0.118
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.576 J	<0.149	<0.118
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	2/14/2023	N	EM06	UMCf	96.8 - 106.5	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	4/15/2022	N	BL02	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	<0.105	<0.430	0.478 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.315 J	<0.149	<0.118
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	2/15/2023	N	EM06	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08D	4/13/2022	N	BL02	UMCf	98.6 - 108.6	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	8.05	<0.101	<0.127	2.63	<0.278	<0.149	<0.118
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	<0.105	<0.430	<0.846 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08DD	4/20/2022	N	BL02	UMCf	119.8 - 129.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.486 J	<0.149	<0.118
U4-MW-08DD	4/20/2022	FD	BL02	UMCf	119.8 - 129.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.531 J	<0.149	<0.118
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08I	4/13/2022	N	BL02	UMCf	78.0 - 88.0	<0.105	<0.430	1.14 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.37	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.48	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	<0.105	<0.430	0.436 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0							

Table 5  
 Groundwater Analytical Results  
 Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						Isopropylbenzene	m,p-Xylene (Sum of Isomers)	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	p-Cymene (p-Isopropyltoluene)	sec-Butylbenzene	Styrene	tert-Amyl Methyl Ether	tert-Butyl Alcohol	tert-Butyl Methyl Ether (MTBE)	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12D	4/15/2022	N	BL02	UMCf	97.1 - 107.1	<0.105	<0.430	0.639 J	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12D	9/27/2022	N	EM01	UMCf	97.1 - 107.1	<2.10	<8.60	<8.60	<20.0	<3.14	<1.99	<3.48	<2.40	<2.50	<2.36	<3.90	<81.2	<2.02	<2.54	<6.00	<5.56	<2.98	<2.36
U4-MW-12D	10/12/2022	N	EM02	UMCf	97.1 - 107.1	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12D	11/2/2022	N	EM03	UMCf	97.1 - 107.1	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
U4-MW-12D	12/7/2022	N	EM04	UMCf	97.1 - 107.1	<0.105	<0.430	1.31 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12D	1/12/2023	N	EM05	UMCf	97.1 - 107.1	<10.5	<43.0	<43.0	<100	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-12D	2/15/2023	N	EM06	UMCf	97.1 - 107.1	<10.5	<43.0	<43.0	<100 UJ	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5 UJ	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-12I	4/14/2022	N	BL02	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.31	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	4/14/2022	FD	BL02	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	9/27/2022	N	EM01	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118 UJ	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	11/2/2022	N	EM03	UMCf	76.8 - 86.8	<0.105	<0.430	1.52 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.105	<0.430	4.69 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	<0.105	<0.430	4.62 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	<0.105	<0.430	1.37 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	2/15/2023	N	EM06	UMCf	76.8 - 86.8	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	7.16	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	<1.05	<4.30	5.02 J	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	<0.105	<0.430	0.543 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.105	<0.430	0.508 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.105	<0.430	0.439 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	<2.10	<8.60	<8.60	<20.0	<3.14	<1.99	<3.48	<2.40	<2.50	<2.36	<3.90	<81.2	<2.02	<2.54	<6.00	<5.56	<2.98	<2.36
U4-MW-13D	2/15/2023	N	EM06	UMCf	98.2 - 108.2	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195 UJ	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.13 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	<0.105	<0.430	<0.430	2.01 J	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.395 J	<0.149	<0.118
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	5.02	0.914 J	<0.149	<0.118
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	<0.105	<0.430	0.573 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	<0.525 UJ	<2.15 UJ	7.70 J	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	<0.105	<0.430	1.03 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13I	2/14/2023	N	EM06	UMCf	77.1 - 87.1	<0.525 UJ	<2.15 UJ	<2.15 UJ	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	<0.525 UJ	<2.15 UJ	<2.15 UJ	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.75	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<0.525 UJ	<2.15 UJ	<2.15 UJ	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.48 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	&		







Table 5 Groundwater Analytical Results Unit 4 Source Area Bioremediation Treatability Study

Table with 20 columns: Well, Sample Date, QC Type, Event, Screened Lithology, Screened Interval, Volatile Organic Compounds by SW8260B (Trichloroethene, Trichlorofluoromethane, Vinyl Chloride, Xylenes, Total Organic Carbon), SW9060A/SM5310B (3-Methylbutanoic Acid, Acetic Acid, Butyric Acid, Formic Acid), and Volatile Fatty Acids by AM23G (Hexanoic Acid, i-Hexanoic Acid, Lactic Acid, Pentanoic Acid, Propionic Acid, Pyruvic Acid).

Notes:
FD - Field duplicate
E - Field instrument error.
J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J- - The result is an estimated quantity, but the result may be biased low.
J+ - The result is an estimated quantity, but the result may be biased high.
mg/L - milligrams per liter
µg/L - micrograms per liter
N - Normal field sample
R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UMCF- Upper Muddy Creek Formation
< - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
-- Not tested.