August 15, 2023 Project No. 31406585.016

Ms. Maureen Hatfield

MC-127
VCP-CA Section, Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

RE: DNAPL RECOVERY ACTIVITIES QUARTERLY REPORT – 2ND QUARTER 2023
UNION PACIFIC RAILROAD HOUSTON WOOD PRESERVING WORKS FACILITY
4910 LIBERTY ROAD FACILITY, HOUSTON, TEXAS
POST-CLOSURE CARE PERMIT NO. HW-50343; INDUSTRIAL SWR NO. 31547

Dear Ms. Hatfield:

WSP USA Inc. (WSP), on behalf of Union Pacific Railroad Company (UPRR), submits this 2nd Quarter 2023 summary report for the dense non-aqueous phase liquid (DNAPL) recovery activities conducted at the UPRR Houston Wood Preserving Works Facility (the Site).

DNAPL Recovery Summary – 2nd Quarter 2023

Below is a summary of the DNAPL recovery activities for the 2nd Quarter 2023:

- Monthly DNAPL recovery volumes have remained elevated after the well redevelopment in August and October 2022, but have continued to decline.
- DNAPL was detected in MW-49A in June 2023 for the first time. The well was added to the recovery well list.
- DNAPL was recovered from six wells (MW-12B, MW-32B, MW-41B, MW-49A, MW-49B, and MW-70B) during 2nd Quarter 2023. Four of the recovery wells (MW-32B, MW-49A, MW-49B, and MW-70B) exhibited measurable DNAPL during at least one of the seven semi-monthly events during the 2nd Quarter 2023. Wells MW-12B and MW-41B exhibited recoverable DNAPL during each event, but the groundwater/DNAPL interface was not measurable as it remained below the dedicated pumps in both wells.
- Approximately 23 gallons of DNAPL were recovered during the 2nd Quarter 2023.
- MW-44C was damaged throughout the quarter.

DNAPL Recovery Procedures

As detailed in the Response Action Plan (RAP) dated November 24, 2014, a 24-month DNAPL recovery pilot test, consisting of manual DNAPL recovery from selected wells on a monthly basis, was conducted at the Site. Following the 24-month pilot testing period, the DNAPL recovery activities have continued monthly following the same procedures detailed in the RAP. In response to the Texas Commission on Environmental Quality

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(TCEQ) Technical Notice of Deficiency dated April 11, 2019, the DNAPL recovery frequency was increased to bi-monthly (twice a month) in June 2019.

The following monitoring wells are part of the current DNAPL recovery activities:

Well Name	Zone
MW-49A*	A-TZ
MW-57A	A-TZ
MW-78A	A-TZ
MW-12B	B-TZ
MW-32B	B-CZ
MW-41B	B-TZ
MW-49B	B-CZ
MW-57B	B-CZ
MW-68B	B-TZ
MW-70B	B-CZ
MW-74B	B-TZ
MW-75B	B-CZ
MW-23C	C-TZ
MW-34CR	C-TZ
MW-44C	C-TZ
MW-45C	C-TZ
MW-46C	C-TZ

The locations of the DNAPL recovery wells are shown on Figure 1. MW-49A was added to the list after first detection in June 2023.

DNAPL recovery activities consist of measuring the depth to groundwater surface, the depth to groundwater/DNAPL interface, and the total depth of the well relative to the top of casing prior to DNAPL recovery. DNAPL recovery from each well is then performed using a peristaltic pump or submersible pump. Beginning in October 2019, the DNAPL encountered in MW-12B and MW-41B was too thick for the submersible pump to efficiently recover. Two stainless steel pneumatic pulse pumps (gas displacement pumps) from QED Environmental Systems (model LP1301) were installed in MW-12B and MW-41B on March 30, 2020. These pumps are designed for recovering the more viscous liquids observed in these wells. DNAPL is pumped from the bottom of each well until groundwater returns in the pump discharge. The volume of recovered DNAPL is estimated from each well based on the volume pumped, and the well is gauged to measure the total depth of the well and depth to DNAPL following pumping. Recovered DNAPL from all the wells is consolidated into a 55-gallon drum and temporarily stored at the Containment Storage Area at the site pending disposal at TCEQ-permitted facilities including the Clean Harbors Deer Park Facility in La Porte, Texas or the US Ecology Robstown Facility in Robstown, Texas. The most recent waste manifest for the disposal of recovered DNAPL and groundwater is provided in Attachment 1.

2nd Quarter 2023 DNAPL Recovery Activities

A summary of the DNAPL recovery measurements from February 2013 through June 2023 is provided in Table 1. DNAPL thicknesses listed on the table and referenced in this letter are “in-well thicknesses”. A graph of DNAPL thicknesses measured prior to each recovery effort over time from February 2013 through

June 2023 is presented on Figure 2, with individual graphs for each zone and/or portion of the Site (Figures 3 through 7) discussed below. Observations from the 2nd Quarter 2023 gauging and recovery activities are provided below for each of the groundwater bearing units (GWBUs):

- A-TZ Wells: Recovery wells MW-57A and MW-78A completed in the A-TZ were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2023 shown on Figure 3).

    - **MW-49A:** During the 2nd Quarter 2023, measurable DNAPL was recorded for the first time in monitoring well MW-49A. DNAPL recovery at this well began on June 1, 2023, and DNAPL thickness in the well ranged from 3 feet on June 15th to 0.5 feet on June 29th. A total of approximately 1.1 gallons of DNAPL were recovered from MW-49A during 2nd Quarter 2023. A review of the monitoring well boring logs for wells MW-49A and MW-49B (located approximately 30 feet of each other) indicates that MW-49A is screened approximately 5 feet into the underlying B-CZ clay (screen interval of 20 to 30 feet below ground surface (bgs), with top of B-CZ clay at 25.3 feet bgs). Well MW-49B is screened in the B-CZ from 30 to 35 feet (top of the B-CZ is at 25.5 feet bgs). NAPL was noted on the MW-49B boring log in the B-CZ clay as shallow as 27.5 feet bgs. Therefore, the NAPL observed in MW-49A may be from the B-CZ instead of the overlying A-TZ. UPRR has incorporated this well into the semi-monthly DNAPL recovery events and will continue to assess the information for these wells.

    - **MW-57A:** No DNAPL was detected nor recovered from MW-57A during 2nd Quarter 2023. DNAPL has not been detected in this well since May 2019, when a trace amount was measured. Measurable DNAPL has not been recorded in MW-57A since August 2015.

    - **MW-78A:** A trace amount of DNAPL was detected but not measurable during the May 5th, June 1st, and June 15th events during the 2nd Quarter 2023. Measurable DNAPL has not been detected in this well since December 2020.

- B-TZ Wells (West Side): Recovery wells MW-12B and MW-41B completed in the B-TZ were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2023 shown on Figure 4).

    MW-12B: During the 2nd Quarter 2023 recovery events at MW-12B, the groundwater/DNAPL interface were below the top of the pneumatic pulse pump. As a result, the interface probe could not get past the pump assembly, and it was not possible to record a DNAPL thickness in the well. On October 8, 2021, the pump was removed in order to verify the total depth of the well and length of the pump. The pump length was measured to be approximately 1.55 feet. Based on the measured length of the pump assembly, the assumption is there is less than approximately 1.5-2 feet of DNAPL in the well. Approximately 1.3 gallons of DNAPL were recovered from MW-12B using the pneumatic pump during the 2nd Quarter 2023.

    - **MW-41B:** Similar to MW-12B, the groundwater/DNAPL interface in MW-41B was below the top of the pneumatic pulse pump during the 2nd Quarter 2023. On October 8, 2021, the pump length was measured to be approximately 1.55 feet. Based on measured length of the pump assembly, the assumption is there is less than approximately 1.5-2 feet of DNAPL in the well. Approximately 2 gallons of DNAPL were recovered from MW-41B using the pneumatic pump during the 2nd Quarter 2023.

- B-TZ/B-CZ Wells (North (on-site and off-site)): Recovery wells MW-32B, MW-57B, MW-68B, and MW-70B completed in either the B-TZ or B-CZ on the north side of the Site or off-site to the north were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2023 shown on Figure 5).

    - **MW-32B (off-site):** Following the redevelopment of MW-32B during the 3rd Quarter 2022, DNAPL thickness observed in the well increased in October 2022 but has since shown a decline through the 2nd Quarter 2023. During the DNAPL recovery event on January 13, 2023, DNAPL thickness was measured at 6.76 feet. By June 29, 2023, the DNAPL thickness decreased to 2.5 feet. Approximately 6.1 gallons of DNAPL were recovered from MW-32B during the 2nd Quarter 2023.

    - **MW-57B (on-site):** No measurable DNAPL was detected during any of the 2nd Quarter recovery events; however, a trace amount of DNAPL was detected but not measurable on April 6th, June 1st, June 15th, and June 29th. No DNAPL was recovered from MW-57B during 2nd Quarter 2023.

    - **MW-68B (off-site):** No measurable DNAPL was detected during any of the 2nd Quarter recovery events; however, a trace amount of DNAPL was detected but not measurable on April 6th, April 19th, May 5th, June 1st, and June 29th. No DNAPL was recovered from MW-68B during 2nd Quarter 2023.

    - **MW-70B (off-site):** Following redevelopment in the 3rd Quarter 2022, DNAPL thickness in MW-70B increased to approximately 3.4 feet in October 2022. During the 2nd Quarter 2023, DNAPL thickness levels fluctuated between 2.45 feet (June 15th) to trace amounts (April 19th, June 1st, and June 29th). Approximately 1.75 gallons of DNAPL was recovered from MW-70B during 2nd Quarter 2023.

- B-TZ/B-CZ Wells (Englewood Intermodal Yard): Recovery wells MW-49B, MW-74B, and MW-75B in the Englewood Intermodal Yard completed in the B-CZ and B-TZ were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2023 shown on Figure 6).

    - **MW-49B:** During the 2nd Quarter 2023, measurable DNAPL was recorded in MW-49B during all seven of the DNAPL recovery events. This well was redeveloped in August 2022 and DNAPL thickness in the well significantly increased (measured at 15.5 feet on September 30, 2022). During the 2nd Quarter 2023, thicknesses ranged from 11.56 feet on April 6th to 2.80 feet on June 1st. Approximately 10.6 gallons of DNAPL were recovered from MW-49B during 2nd Quarter 2023.

      Even though the well was redeveloped in August 2022, recent total depth measurements at MW-49B have been approximately 7 feet shallower than the well construction depth and suggest that the well has an obstruction or casing failure. The well will be plugged, abandoned, and replaced at a later date.

- **MW-74B:** A trace amount of DNAPL was observed in MW-74B on June 29, 2023. No DNAPL was detected nor recovered from MW-74B during the remainder of 2nd Quarter 2023. No measurable DNAPL has been detected in this well since November 2021.

- **MW-75B:** Measurable DNAPL has only been detected once in MW-75B since June 2021. A trace amount of DNAPL was observed in MW-74B on June 29, 2023. No DNAPL was detected nor recovered from MW-74B during the remainder of 2nd Quarter 2023.

- C-TZ Wells: Wells MW-23C, MW-34CR, MW-44C, MW-45C, and MW-46C completed in the C-TZ were evaluated for DNAPL recovery (graph of DNAPL thickness from July 2018 through June 2023 shown on Figure 7).

  - **MW-23C:** No DNAPL was detected nor recovered from this well during the seven recovery events for the 2nd Quarter 2023. Measurable DNAPL has not been detected in MW-23C since February 2022.

  - **MW-34CR:** In May 2014, replacement well MW-34CR was installed and gauged as part of the recovery program. However, no DNAPL has been detected in this well. No DNAPL was observed during the well redevelopment on August 30, 2022. Given the absence of DNAPL in this well, a graph for MW-34CR is not included in Figure 7.

  - **MW-44C:** No measurable DNAPL had been detected in MW-44C from June 2019 (trace DNAPL noted in mid-June 2019) through May 2020. DNAPL was noted (0.39 feet thick) in MW-44C at the end of May 2020. However, the total depth measurement at MW-44C was approximately 10 feet higher than the well construction depth, suggesting that the well had appeared to have silted up. MW-44C was re-developed on July 24, 2020 during the site-wide monitoring activities. Over 10 feet of silt was removed, and the final measured depth of the well was within a foot of the original total depth. During the next recovery event in early August, the well appeared to have silted up again. Redevelopment was attempted a second time on October 1, 2020, but it was unsuccessful. MW-44C was not included in the August 2022 well redevelopment activities. The well will be plugged, abandoned, and replaced with a proposed recovery well as detailed in the RAP dated August 31, 2020.

  - **MW-45C:** No DNAPL was detected nor recovered from this well during six of the seven 2nd Quarter 2023 recovery events. A trace amount of DNAPL was observed in MW-45C on June 29th. No measurable DNAPL has been recorded in MW-45C since March 2022.

  - **MW-46C:** No DNAPL was detected nor recovered from this well during six of the seven 2nd Quarter 2023 recovery events. A trace amount of DNAPL was observed in MW-45C on June 29th. No measurable DNAPL has been recorded in MW-46C since May 2019.

DNAPL Recovery: From February 2013 to June 2023, an estimated cumulative total of approximately 1,026 gallons of creosote DNAPL have been recovered from the wells at the Site. Monthly DNAPL recovery volumes increased after the January 2015 event due to a change in pumping techniques. Recovery volumes began to decline in 2020 and decreased significantly beginning in September 2021. Eleven of the wells were redeveloped in August 2022 and two additional wells were redeveloped in October 2022. Following the redevelopment, DNAPL recovery volumes increased. During 2nd Quarter 2023, MW-49A was added to bi-

monthly recovery activities and the first recorded recovery for this well took place on June 1st. During 2nd Quarter 2023, an average of 3.3 gallons was recovered per recovery event and recovery volumes ranged from approximately 1.7 - 4.5 gallons per event. A total of approximately 22.9 gallons of DNAPL were recovered during the 2nd Quarter 2023 (Table 1). UPRR will continue to monitor the DNAPL thicknesses twice per month as discussed in the response to the TCEQ 4th Technical Notice of Deficiency (TNOD) letter (April 11, 2019).

If you have any questions or need additional information, please feel free to call us at (512) 671-3434 or Mr. Kevin Peterburs of UPRR at (414) 267-4164.

Sincerely,

Golder Associates USA Inc.

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CC: Waste Program Manager, TCEQ Region 12, Houston
Mr. Kevin Peterburs, UPRR – Milwaukee, WI

Attachments:
Table 1 - Summary of DNAPL Recovery Measurements
Figure 1 – In-Well DNAPL Thickness – June 23, 2023
Figure 2 - DNAPL Recovery Activities February 2013 – June 2023
Figure 3 – A-TZ Wells – DNAPL Recovery Activities July 2018 – June 2023
Figure 4 – B-TZ Wells (West Side) – DNAPL Recovery Activities July 2018 – June 2023
Figure 5 – B-CZ/B-TZ Wells (North (On-Site and Off-Site) – DNAPL Recovery Activities July 2018 – June 2023
Figure 6 – B-CZ/B-TZ Wells (Englewood Intermodal Yard) – DNAPL Recovery Activities July 2018 – June 2023
Figure 7 – C-TZ Wells – DNAPL Recovery Activities July 2018 – June 2023
Attachment 1 – Recovered DNAPL Waste Manifest

TABLES

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-12B				MW-23C				MW-32B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	9.06	39.87	5.93	2.5	NM	NM	NM	0	6.01	30.06	6.23	2
4/3/2013	9.41	39.95	5.85	1.0	NM	NM	NM	0	4.86	33.61	2.68	1
4/22/2013	8.61	31.64	14.16	0.5*	NM	NM	NM	0	5.62	36.08	0.21	0.3
5/30/2013	8.47	37.62	8.18	1.5*	NM	NM	NM	0	5.86	32.21	4.08	2
6/29/2013	9.62	38.22	7.58	1.5	NM	NM	NM	0	6.79	33.59	2.7	1.5
7/22/2013	11.16	39.04	6.76	1.0	NM	NM	NM	0	7.14	33.91	2.38	1.5
8/26/2013	11.31	39.61	6.19	1.0	NM	NM	NM	0	7.48	33.83	2.46	1
9/27/2013	11.17	40.63	5.17	1.0	NM	NM	NM	0	7.23	34.39	1.9	1
10/31/2013	11.09	43.71	2.09	1.0	NM	NM	NM	0	7.16	34.96	1.33	0.5
11/27/2013	11.17	44.06	1.74	1.0	NM	NM	NM	0	7.29	35.03	1.26	0.5
12/31/2013	11.02	44.62	1.18	1.0	NM	NM	NM	0	7.16	35.16	1.13	0.5
1/30/2014	11.34	45.12	0.68	1.0	NM	NM	NM	0	6.72	34.82	1.47	0.5
3/3/2014	11.17	44.32	1.48	1.0	NM	NM	NM	0	6.53	34.52	1.77	0.5
3/31/2014	11.03	44.53	1.27	1.0	NM	NM	NM	0	6.29	34.21	2.08	0.5
4/30/2014	10.92	44.26	1.54	1.0	NM	NM	NM	0	6.42	34.67	1.62	0.5
5/27/2014	10.81	44.34	1.46	1.0	NM	NM	NM	0	6.36	34.72	1.57	0.5
6/26/2014	10.72	44.61	1.19	1.0	NM	NM	NM	0	6.21	34.61	1.68	0.5
7/31/2014	10.13	44.96	0.84	1.0	NM	NM	NM	0	6.06	34.33	1.96	0.3
8/27/2014	10.26	45.12	0.68	1.0	NM	NM	NM	0	6.18	34.98	1.31	0.3
10/3/2014	10.17	44.91	0.89	1.0	NM	NM	NM	0	6.06	34.72	1.57	0.3
11/3/2014	10.29	44.97	0.83	1.0	22.51	70.71	2.09	0.3	6.18	34.91	1.38	0.3
11/24/2014	10.27	44.99	0.81	1.0	22.56	70.92	1.88	0.5	6.21	35.16	1.13	0.5
12/22/2014	10.23	44.71	1.09	1.0	22.47	70.81	1.99	0.5	6.14	35.02	1.27	0.8
1/29/2015	10.16	44.96	0.84	1.0	22.26	71.04	1.76	0.5	5.71	35.29	1	0.8
2/26/2015	10.12	44.96	0.84	1.5	22.06	71.09	1.71	0.5	6.02	35.29	1	1
3/26/2015	9.96	45.21	0.59	1.5	22.17	71.12	1.68	0.3	5.46	35.36	0.93	1
4/27/2015	9.89	45.37	0.43	1.5	22.23	71.06	1.74	0.5	5.21	35.29	1	1
5/26/2015	9.72	45.61	0.19	2.0	22.17	71.14	1.66	0.5	5.07	35.46	0.83	1
7/6/2015	7.12	45.96	0.24	2.0	19.01	71.39	1.41	0.5	4.06	35.66	0.63	1
8/3/2015	7.26	46.09	0.11	2.0	19.16	71.46	1.34	0.8	4.29	35.71	0.58	1
8/27/2015	8.09	46.01	0.19	1.0	20.34	71.51	1.29	0.8	5.05	35.77	0.52	1
10/5/2015	7.12	45.86	0.34	1.0	19.02	71.57	1.23	0.5	4.31	35.96	0.33	1
11/5/2015	6.86	45.81	0.39	1.0	18.59	71.59	1.21	0.5	4.02	35.91	0.38	1
12/3/2015	6.46	45.79	0.41	1.0	18.33	71.67	1.13	0.5	3.92	35.96	0.33	1
12/28/2015	6.23	45.62	0.58	1.3	23.21	71.61	1.19	0.8	3.73	35.91	0.38	1
2/3/2016	6.04	45.55	0.65	1.5	17.96	71.64	1.16	0.5	3.61	35.87	0.42	1
3/3/2016	5.96	45.61	0.59	1.5	17.92	71.71	1.09	0.5	3.51	35.91	0.38	1
3/31/2016	6.06	45.72	0.48	1.5	17.86	71.79	1.01	0.5	3.56	35.92	0.37	1
5/3/2016	6.13	45.66	0.54	1.0	NM	NM	NM	0.0	3.67	35.87	0.53	0.5
6/2/2016	6.21	45.61	0.59	1.0	22.9	71.51	1.29	0.5	3.74	35.92	0.48	0.5
7/8/2016	6.29	45.72	0.48	1.0	23.09	71.52	1.28	0.3	3.91	35.96	0.44	0.5
8/3/2016	6.34	45.77	0.43	1.0	23.16	71.66	1.14	0.3	4.03	35.49	0.91	0.5
8/30/2016	6.47	45.69	0.51	1.0	23.31	71.61	1.19	0.5	4.22	36.09	0.31	0.5
9/30/2016	6.59	45.81	0.39	1.0	23.39	71.81	0.99	0.5	4.33	35.91	0.49	0.5
11/3/2016	6.64	45.92	0.28	1.0	23.41	71.98	0.82	0.5	4.47	35.99	0.41	0.5
11/30/2016	6.86	45.86	0.34	0.5	23.59	71.91	0.89	0.8	4.62	35.91	0.49	0.5
1/4/2017	7.02	45.81	0.39	0.5	23.74	71.82	0.98	0.8	4.83	36.02	0.38	0.3
2/7/2017	6.97	45.69	0.51	0.5	23.67	71.74	1.06	0.8	4.81	35.91	0.49	0.3
3/2/2017	6.91	45.64	0.56	0.5	23.54	76.82	0.98	0.8	4.66	35.97	0.43	0.3
4/3/2017	6.82	45.71	0.49	0.5	23.46	76.96	0.84	0.8	4.57	36.01	0.39	0.3
4/27/2017	6.74	45.64	0.56	0.5	23.21	77.04	0.76	0.5	4.51	36.06	0.34	0.3
5/29/2017	6.89	45.77	0.43	0.5	23.49	77.21	0.59	0.3	4.74	36.03	0.37	0.3
7/5/2017	7.01	45.71	0.49	0.5	23.61	77.27	0.53	0.3	4.86	36.13	0.27	0.3
8/1/2017	7.14	45.63	0.57	0.8	23.79	77.17	0.63	0.3	4.99	36.24	0.16	0.3
9/5/2017	7.03	45.6	0.6	1.0	23.67	77.29	0.51	0.3	4.78	36.24	0.16	0.3
10/4/2017	7.07	45.69	0.51	1.0	23.61	77.36	0.44	0.3	4.89	36.29	0.11	0.3
11/2/2017	7.11	45.76	0.44	1.0	23.74	77.42	0.38	0.3	4.96	36.26	0.14	0.3
11/29/2017	7.16	45.71	0.49	1.0	23.81	77.4	0.40	0.3	5.06	36.31	0.09	0.3
1/2/2018	6.96	45.82	0.38	1.0	23.67	77.43	0.37	0.3	4.93	36.27	0.13	0.3
2/7/2018	7.13	45.87	0.33	1.0	23.86	77.46	0.34	0.3	5.16	36.21	0.19	0.3
3/1/2018	7.36	45.96	0.24	1.0	23.96	77.41	0.39	0.3	5.38	36.13	0.27	0.3
4/2/2018	7.29	45.94	0.26	1.0	23.9	77.32	0.48	0.5	5.31	36.18	0.22	0.3
5/1/2018	8.17	45.91	0.29	1.0	24.47	77.39	0.41	0.5	6.12	36.23	0.17	0.5

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-12B				MW-23C				MW-32B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/1/2018	8.49	45.86	0.34	1.0	24.81	77.31	0.49	0.5	6.41	36.19	0.21	0.5
6/29/2018	8.62	45.81	0.39	1.0	24.99	77.37	0.43	0.5	6.59	36.11	0.29	0.8
8/3/2018	8.79	45.96	0.24	1.0	25.12	77.39	0.41	0.5	6.74	36.19	0.21	0.8
8/31/2018	8.32	46.01	0.19	0.8	24.81	77.43	0.37	0.5	6.47	36.23	0.17	0.8
9/28/2018	8.27	45.93	0.27	0.5	24.69	77.39	0.41	0.5	6.41	36.19	0.21	0.8
11/2/2018	8.16	45.91	0.29	0.5	24.57	77.36	0.44	0.5	6.33	36.21	0.19	0.5
11/29/2018	8.01	45.9	0.30	0.5	24.36	77.3	0.50	0.5	6.21	36.27	0.13	0.3
1/2/2019	7.96	45.87	0.33	0.5	24.29	77.31	0.49	0.5	6.09	36.29	0.11	0.3
2/2/2019	7.82	45.89	0.31	0.5	24.21	77.44	0.36	0.5	5.97	36.24	0.16	0.5
2/28/2019	7.69	45.81	0.39	0.5	24.16	77.36	0.44	0.5	5.86	36.21	0.19	0.3
4/2/2019	7.61	45.8	0.4	0.5	24.08	77.32	0.48	0.5	5.79	36.24	0.16	0.3
4/25/2019	7.49	45.76	0.44	1.0	24.01	77.16	0.64	0.5	5.86	36.29	0.11	0.3
5/29/2019	7.51	45.71	0.49	1.0	24.11	77.11	0.69	0.5	5.91	36.21	0.19	0.3
6/12/2019	6.81	45.52	0.68	1.5	24.39	76.71	1.09	1.0	5.46	35.91	0.49	0.5
6/30/2019	6.67	45.06	1.14	2.0	24.32	76.67	1.13	0.8	5.39	35.42	0.98	1
7/16/2019	6.62	45.11	1.09	2.0	24.26	76.61	1.19	1.0	5.32	35.36	1.04	1
8/2/2019	6.69	45.01	1.19	1.5	24.31	76.49	1.31	1.5	5.41	35.26	1.14	1.5
8/15/2019	6.79	44.76	1.44	2.0	24.22	76.36	1.44	1.5	5.61	35.19	1.21	1.5
8/28/2019	6.88	44.71	1.49	2.0	24.29	76.41	1.39	1.5	5.72	35.22	1.18	1.5
9/17/2019	6.93	43.96	2.24	3.0	24.36	76.29	1.51	1.5	5.81	35.17	1.23	1.5
10/2/2019	6.86	43.17	3.03	0.0	24.32	76.09	1.71	1.5	5.77	35.02	1.38	1.5
10/16/2019	6.71	30.29	15.91	0.0	25.75	75.89	1.91	1.5	4.36	33.42	2.98	1.5
10/31/2019	6.53	21.63	24.57	0.0	26.33	75.29	2.51	1.5	3.43	31.86	4.54	1.5
11/15/2019	7.21	19.12	27.08	0.5	25.69	ND	0	0.0	3.47	35.7	0.7	1
12/3/2019	7.55	27.37	18.83	0.0	26.11	75.12	2.68	1.5	4.33	35.51	0.89	0
12/18/2019	12.68	35.9	10.3	0.0	26.13	77.4	0.4	0.3	4.71	35.61	0.79	1.5
12/30/2019	8.08	28.12	18.08	0.0	26.48	76.1	1.7	0.1	5.04	34.28	2.12	1.5
1/7/2020	--	--	--	--	--	--	--	--	--	--	--	--
1/15/2020	7.47	27.12	19.08	0.0	26.49	77.1	0.7	0.0	4.1	35.4	1	1
1/27/2020	6.28	21.06	25.14	0.0	25.99	76.58	1.22	0.0	3.01	31.15	5.25	1
2/13/2020	6.91	20.42	25.78	0.0	25.51	76.42	1.38	0.0	3.88	31.39	5.01	1
2/25/2020	6.4	23.6	22.6	0.0	25.6	75.5	2.3	0.1	3.9	31.05	5.35	0.8
3/13/2020	7.61	22.01	24.19	0.0	25.66	77.08	0.72	0.0	4.32	32.46	3.94	1.3
3/31/2020	7.88	22.01**	24.19	2.5	25.9	77.12	0.68	0.0	4.63	33.3	3.1	0.3
4/9/2020	7.37	18.21	27.99	3.0	25.91	77.22	0.58	0.0	4.65	30.14	6.26	1.0
4/27/2020	8.64	19.12	27.08	3.5	26.31	76.45	1.35	0.0	5.39	34.52	1.88	0.5
5/14/2020	9.39	33.16	13.04	2.5	26.7	75.89	1.91	0.1	6.02	34.73	1.67	0.5
5/28/2020	8.79	40.29	5.91	1.5	26.75	75.71	2.09	0.1	5.84	34.35	2.05	1.0
6/11/2020	9.29	40.69	5.51	2.5	26.93	ND	0	0.0	5.89	35.01	1.39	0.3
6/25/2020	9.01	BP	NM	2.0	25.89	77.94	0	0.0	5.6	35.12	1.28	0.3
7/9/2020	8.04	BP	NM	1.0	26.64	76	1.8	0.3	4.83	35.18	1.22	0.3
7/23/2020	8.17	BP	NM	2.5	26.81	75.61	2.19	0.3	5.63	34.7	1.7	1.0
8/6/2020	5.43	BP	NM	1.0	26.41	75.52	2.28	0.3	3.88	33.94	2.46	1.3
8/20/2020	8.03	BP	NM	1.0	26.38	75.4	2.4	0.3	4.87	33.87	2.53	0.5
9/2/2020	8.89	BP	NM	1.0	26.71	76.24	1.56	0.5	5.54	35.21	1.19	0.3
9/17/2020	9.84	BP	NM	0.0	26.99	75.9	1.9	0.5	6.01	34.4	2	0.5
10/1/2020	6.9	BP	NM	0.5	26.59	75.08	2.72	0.3	4.88	35.18	1.22	0.3
10/14/2020	8.42	BP	NM	2.5	26.71	75.08	2.72	0.3	4.95	34.26	2.14	0.5
10/28/2020	8.31	BP	NM	2.0	26.84	75.81	1.99	0.3	5.31	33.94	2.46	0.8
11/12/2020	9.19	BP	NM	1.0	27.12	76.12	1.68	TR	5.79	33.71	2.69	2.5
11/23/2020	9.55	BP	NM	0.8	27.41	76.28	1.52	0.3	6.24	34.19	2.21	1.0
12/10/2020	6.67	BP	NM	1.5	26.72	76.2	1.6	0.3	3.68	32.9	3.5	1.0
12/21/2020	5.46	BP	NM	0.8	26.21	NM	NM	0.0	3.89	32.82	3.58	1.0
1/7/2021	5.01	BP	NM	1.0	25.85	ND	0	0.0	3.02	35.4	1	1.0
1/21/2021	5.72	BP	NM	2.0	25.49	75.29	2.51	0.3	3.48	35.01	1.39	1.0
2/4/2021	6.87	BP	NM	1.5	25.48	75.36	2.44	1.3	4.09	34.48	1.92	1.0
2/23/2021	5.47	BP	NM	1.0	25.25	75.61	2.19	1.0	3.19	33.59	2.81	1.0
3/11/2021	5.95	BP	NM	0.8	25.31	75.84	1.96	1.0	3.47	34.05	2.35	1.0
3/25/2021	9.28	BP	NM	1.0	25.2	75.62	2.18	1.0	3.85	34.83	1.57	1.0
4/8/2021	7.52	BP	NM	1.0	25.38	75.4	2.4	1.0	4.92	33.7	2.7	1.0
4/22/2021	8.42	BP	NM	1.0	25.94	76.35	1.45	0.1	5.03	34.2	2.2	1.0
5/4/2021	6.82	BP	NM	1.0	25.95	75.25	2.55	1.0	4.26	34.6	1.8	1.0
5/20/2021	5.52	BP	NM	1.0	25.84	75.66	2.14	1.0	3.55	34.2	2.2	1.0

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-12B				MW-23C				MW-32B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/3/2021	5.46	BP	NM	1.0	25.19	75.74	2.06	0.5	2.54	34.6	1.8	1.0
6/17/2021	6.67	BP	NM	1.0	25.06	75.62	2.18	0.5	3.08	33.98	2.42	1.0
7/1/2021	5.46	BP	NM	1.0	24.72	75.12	2.68	0.5	2.61	34.38	2.02	1.0
7/19/2021	5.08	BP	NM	1.0	23.99	74.9	2.9	0.5	2.68	34.18	2.22	0.5
7/29/2021	7.1	BP	NM	1.0	24.19	75.25	2.55	0.3	3.71	34.10	2.3	0.5
8/12/2021	8.71	BP	NM	1.0	24.96	75.72	2.08	0.3	4.96	34.19	2.21	1.0
8/26/2021	8.93	BP	NM	1.0	25.42	75.81	1.99	0.5	5.2	34.8	1.6	1.0
9/10/2021	8.91	BP	NM	0.7	25.87	75.79	2.01	Trace	5.68	34.48	1.92	1.1
9/22/2021	7.42	BP	NM	0	25.93	ND	0	0	4.72	31.15	5.25	1.3
10/8/2021	6.00	45.60	0.10	0	25.68	75.60	2.20	0	3.30	32.70	3.70	1.0
10/20/2021	7.81	44.00	1.70	0	26.14	ND	0	0	4.82	32.82	3.58	1.2
11/4/2021	6.03	BP	NM	0	25.57	ND	0	0	3.93	33.30	3.10	1.5
11/18/2021	6.75	BP	NM	0	25.65	74.80	1.71	0	4.3	33.61	2.79	0.3
12/3/2021	6.30	BP	NM	0	25.79	ND	0	0	4.64	32.70	3.70	1.3
12/16/2021	6.37	BP	NM	0	25.92	76.00	0.51	0	4.84	33.30	2.70	1.3
12/30/2021	6.21	BP	NM	0	25.84	ND	Trace	0	4.22	33.63	2.37	1.5
1/14/2022	6.26	ND	Trace	0	25.92	ND	Trace	0	4.31	33.74	2.26	1.5
1/26/2022	6.32	ND	Trace	0	26.01	ND	Trace	0	4.26	33.61	2.39	1.5
2/10/2022	5.70	43.50	2.20	0.12	25.65	75.3	1.2	0	3.51	34.65	1.35	0.3
2/24/2022	6.53	BP	NM	0.15	26.00	75.51	0.99	0.2	4.87	34.32	1.68	0.3
3/10/2022	6.40	BP	NM	0.2	25.96	ND	0	0	5.03	34.6	1.40	0.5
3/24/2022	6.83	BP	NM	0	26.55	ND	0	0	5.33	35.07	0.93	0.3
4/7/2022	6.98	BP	NM	0.1	26.51	ND	0	0	4.48	35.51	0.53	0.3
4/18/2022	7.49	BP	NM	0.8	26.72	ND	0	0	4.77	35.46	0.54	0.5
5/2/2022	7.95	BP	NM	1.0	26.89	ND	Trace	0	5.12	35.33	0.57	0.5
5/20/2022	6.72	BP	NM	1.0	26.39	ND	0	0	5.21	35.21	0.84	0.5
6/2/2022	6.81	BP	NM	1.0	26.31	ND	0	0	5.39	35.34	0.71	0.5
6/16/2022	9.85	BP	NM	0.5	27.62	ND	Trace	0	5.20	35.50	0.35	0.3
6/30/2022	9.91	BP	NM	0.25	27.98	ND	0	0	6.97	ND	Trace	0.1
7/15/2022	6.89	BP	NM	1.0	27.87	ND	0	0	6.26	35.31	0.69	0.5
7/28/2022	6.96	BP	NM	1.0	27.96	ND	0	0	6.39	35.21	0.79	0.5
8/12/2022	9.10	BP	NM	0.1	28.28	Trace	Trace	0	6.92	34.15	1.85	NM
8/29/2022	8.56	BP	NM	0.5	26.56	ND	0	0	5.52	35.52	0.53	0.5
9/16/2022	8.30	BP	NM	0.5	27.70	ND	0	0	5.20	31.00	5.05	0.5
9/30/2022	9.80	BP	NM	0.25	28.00	ND	0	0	6.40	28.50	7.55	3.0
10/17/2022	11.52	BP	NM	0.25	28.32	ND	0	0	7.10	27.35	8.70	2.0
10/27/2022	11.79	BP	NM	0.25	28.74	ND	0	0	7.49	28.91	7.14	2.0
11/10/2022	11.47	BP	NM	0.25	28.51	ND	0	0	7.22	28.96	7.09	2.0
11/30/2022	7.49	BP	NM	0.25	26.21	ND	0	0	3.76	29.31	6.74	1.5
12/16/2022	7.36	BP	NM	0.25	26.06	ND	0	0	3.52	29.26	6.79	1.5
12/27/2022	7.59	BP	NM	0.25	25.67	ND	0	0	3.71	29.21	6.84	1.5
1/13/2023	8.06	BP	NM	0.25	26.29	ND	0	0	4.06	29.29	6.76	1.5
1/27/2023	5.57	BP	NM	0.25	26.97	ND	0	0	3.67	29.72	6.33	1.0
2/9/2023	5.6	BP	NM	0.10	26.52	ND	0	0	3.74	NM	NM	0.0
2/23/2023	6.42	BP	NM	0.25	26.56	ND	0	0	4.28	29.93	6.12	1.5
3/9/2023	6.52	BP	NM	0.25	26.46	ND	0	0	4.17	29.86	6.19	1.5
3/23/2023	7.25	BP	NM	0.25	27.50	ND	0	0	4.70	31.50	4.55	1.5
4/6/2023	6.63	BP	NM	0.25	26.53	ND	0	0	5.06	31.67	4.38	1.5
4/19/2023	6.55	BP	NM	0.25	27.00	ND	0	0	4.31	31.00	5.05	1.5
5/5/2023	6.8	BP	NM	0.25	26.78	ND	0	0	5.29	31.77	4.28	1.5
5/18/2023	5.22	BP	NM	0.25	26.15	ND	0	0	1.98	32.18	3.87	0.5
6/1/2023	7.85	BP	NM	0.1	26.78	ND	0	0	4.20	32.80	3.25	0.5
6/15/2023	7.88	BP	NM	0.1	26.62	ND	0	0	4.62	33.23	2.82	0.5
6/29/2023	9.05	BP	NM	0.1	27.18	ND	0	0	5.57	33.45	2.50	0.1
Total DNAPL Pumped (gal)				***155.3***				***55.5***				***144.8***

Notes:

* - indicates DNAPL and groundwater mixture

MW-23C- added 5 feet to TOC due to capping after 2/3/2016

** - indicates DTD from previous event was used; DNAPL recovered revised based on review of field notes.

--- - No DNAPL pumped

ND - Not detected

DTW - Depth to water (feet Below Top of Casing (BTOC))

NM - Not measured

DTD - Depth to DNAPL (feet BTOC)

PoP - Product on probe, not measureable

MW-12B- TD measured at 46.2 instead of 45.8, August 28, 2015.

BP - Below pump; depth to DNAPL not measured because DNAPL is below top of in-well pump

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-33BR				MW-34C/MW-34CR (July 2014)				MW-41B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	3.72	ND	0	0	NM	NM	NM	0	8.91	41.1	3.71	3
4/3/2013	4.02	PoP	0	0	NM	NM	NM	0	9.37	41.6	3.21	1.5
4/22/2013	3.63	ND	0	0	NM	NM	NM	0	8.62	41.6	3.21	0.5*
5/30/2013	3.59	ND	0	0	NM	NM	NM	0	8.73	34.16	10.65	2
6/29/2013	6.07	ND	0	0	NM	NM	NM	0	9.72	37.12	7.69	2
7/22/2013	9.68	ND	0	0	NM	NM	NM	0	10.31	39.29	5.52	1.5
8/26/2013	9.86	ND	0	0	NM	NM	NM	0	10.09	34.55	10.26	2.5
9/27/2013	9.57	ND	0	0	NM	NM	NM	0	9.63	37.29	7.52	2
10/31/2013	9.32	ND	0	0	21.63	NM	NM	0	9.52	38.16	6.65	2
11/27/2013	9.16	ND	0	0	NM	NM	NM	0	9.57	38.39	6.42	2
12/31/2013	8.97	ND	0	0	NM	NM	NM	0	9.42	39.36	5.45	2
1/30/2014	7.41	ND	0	0	NM	NM	NM	0	9.06	39.17	5.64	2
3/3/2014	7.16	ND	0	0	NM	NM	NM	0	8.62	38.06	6.75	2
3/31/2014	7.04	ND	0	0	NM	NM	NM	0	8.52	37.74	7.07	2
4/30/2014	6.88	ND	0	0	NM	NM	NM	0	8.36	37.21	7.6	2
5/27/2014	6.72	ND	0	0	NM	NM	NM	0	8.26	37.29	7.52	2
6/26/2014	6.52	ND	0	0	NM	NM	NM	0	8.02	37.47	7.34	2
7/31/2014	6.29	ND	0	0	19.06	ND	0	0	8.21	37.92	6.89	2
8/27/2014	6.47	ND	0	0	18.96	ND	0	0	8.07	38.29	6.52	1.5
10/3/2014	6.32	ND	0	0	18.81	ND	0	0	8.02	38.13	6.68	2
11/3/2014	NM	NM	NM	0	19.06	ND	0	0	8.22	38.29	6.52	2
11/24/2014	NM	NM	NM	0	19.11	ND	0	0	8.27	38.47	6.34	2
12/22/2014	NM	NM	NM	0	19.06	ND	0	0	8.16	38.39	6.42	2
1/29/2015	NM	NM	NM	0	18.79	ND	0	0	8.02	39.16	5.65	1.5
2/26/2015	NM	NM	NM	0	18.71	ND	0	0	7.92	39.06	5.75	2.5
3/26/2015	NM	NM	NM	0	18..67	ND	0	0	7.83	38.74	6.07	2.5
4/27/2015	NM	NM	NM	0	18.79	ND	0	0	8.02	38.61	6.2	3
5/26/2015	NM	NM	NM	0	18.63	ND	0	0	7.91	38.72	6.09	3
7/6/2015	NM	NM	NM	0	17.29	ND	0	0	6.03	38.96	5.85	2.5
8/3/2015	NM	NM	NM	0	17.21	ND	0	0	6.09	39.01	5.8	2.5
8/27/2015	NM	NM	NM	0	18.46	ND	0	0	7.39	39.14	5.67	2
10/5/2015	NM	NM	NM	0	17.29	ND	0	0	6.32	39.34	5.47	2
11/5/2015	NM	NM	NM	0	16.78	ND	0	0	6.01	39.51	5.3	2
12/3/2015	NM	NM	NM	0	16.44	ND	0	0	5.76	39.56	5.25	2
12/28/2015	NM	NM	NM	0	16.16	ND	0	0	5.62	39.63	5.18	2.3
2/3/2016	NM	NM	NM	0	15.98	ND	0	0	5.32	39.72	5.09	3
3/3/2016	NM	NM	NM	0	15.98	ND	0	0	5.17	39.81	5	3
3/31/2016	NM	NM	NM	0	15.98	ND	0	0	5.26	39.77	5.04	3
5/3/2016	NM	NM	NM	0	15.79	ND	0	0	5.52	39.96	4.85	3
6/2/2016	NM	NM	NM	0	15.97	ND	0	0	5.67	40.07	4.74	3
7/8/2016	NM	NM	NM	0	16.06	ND	0	0	5.72	40.01	4.8	3
8/3/2016	NM	NM	NM	0	16.17	ND	0	0	5.79	40.09	4.72	3
8/30/2016	NM	NM	NM	0	16.31	ND	0	0	5.91	40.26	4.55	3
9/30/2016	NM	NM	NM	0	16.42	ND	0	0	6.06	40.13	4.68	3
11/3/2016	NM	NM	NM	0	16.51	ND	0	0	6.11	40.29	4.52	3
11/30/2016	NM	NM	NM	0	16.72	ND	0	0	6.26	40.42	4.39	3
1/4/2017	NM	NM	NM	0	16.94	ND	0	0	6.39	40.56	4.25	3
2/7/2017	NM	NM	NM	0	16.91	ND	0	0	6.44	40.51	4.3	3
3/2/2017	NM	NM	NM	0	16.78	ND	0	0	6.29	40.76	4.05	3
4/3/2017	NM	NM	NM	0	16.71	ND	0	0	6.21	40.67	4.14	2.5
4/27/2017	NM	NM	NM	0	16.61	ND	0	0	6.19	40.87	3.94	3
5/29/2017	NM	NM	NM	0	16.84	ND	0	0	6.14	40.29	4.52	3
7/5/2017	NM	NM	NM	0	17.01	ND	0	0	6.34	40.57	4.24	2.5
8/1/2017	NM	NM	NM	0	17.17	ND	0	0	6.42	40.79	4.02	3
9/5/2017	NM	NM	NM	0	17.11	ND	0	0	6.36	40.68	4.13	3
10/4/2017	NM	NM	NM	0	17.06	ND	0	0	6.29	40.69	4.12	2.5
11/2/2017	NM	NM	NM	0	17.17	ND	0	0	6.41	40.73	4.08	3
11/29/2017	NM	NM	NM	0	17.29	ND	0	0	6.52	40.82	3.99	2.5
1/2/2018	NM	NM	NM	0	17.52	ND	0	0	6.72	40.72	4.09	2.5
2/7/2018	NM	NM	NM	0	18.11	ND	0	0	6.97	40.79	4.02	2.5
3/1/2018	NM	NM	NM	0	18.38	ND	0	0	7.16	40.63	4.18	2
4/2/2018	NM	NM	NM	0	18.29	ND	0	0	7.13	40.71	4.1	2
5/1/2018	NM	NM	NM	0	18.33	ND	0	0	8.26	40.76	4.05	2

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-33BR				MW-34C/MW-34CR (July 2014)				MW-41B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/1/2018	NM	NM	NM	0	18.62	ND	0	0	8.71	40.81	4	2.3
6/29/2018	NM	NM	NM	0	18.91	ND	0	0	9.02	40.71	4.1	2.5
8/3/2018	NM	NM	NM	0	19.06	ND	0	0	9.13	40.76	4.05	2.5
8/31/2018	NM	NM	NM	0	18.77	ND	0	0	8.89	40.86	3.95	2
9/28/2018	NM	NM	NM	0	18.64	ND	0	0	8.77	40.76	4.05	2
11/2/2018	NM	NM	NM	0	18.57	ND	0	0	8.61	40.71	4.1	2
11/29/2018	NM	NM	NM	0	18.39	ND	0	0	8.41	40.81	4	2
1/2/2019	NM	NM	NM	0	18.26	ND	0	0	8.22	40.83	3.98	2
2/2/2019	NM	NM	NM	0	18.19	ND	0	0	8.16	40.89	3.92	2
2/28/2019	NM	NM	NM	0	18.02	ND	0	0	8.03	40.76	4.05	3
4/2/2019	NM	NM	NM	0	17.96	ND	0	0	7.93	40.69	4.12	3
4/25/2019	NM	NM	NM	0	Well Damaged			0	7.76	40.28	4.53	3
5/29/2019	NM	NM	NM	0	Well Damaged			0	7.71	40.07	4.74	3
6/12/2019	NM	NM	NM	0	Well Damaged			0	7.52	39.63	5.18	3
6/30/2019	NM	NM	NM	0	Well Damaged			0	7.46	39.52	5.29	3
7/16/2019	NM	NM	NM	0	Well Damaged			0	7.39	39.46	5.35	3
8/2/2019	NM	NM	NM	0	Well Damaged			0	7.46	39.42	5.39	0
8/15/2019	NM	NM	NM	0	Well Damaged			0	7.51	39.31	5.5	3
8/28/2019	NM	NM	NM	0	Well Damaged			0	7.57	39.21	5.6	3
9/17/2019	NM	NM	NM	0	Well Damaged			0	7.66	39.02	5.79	3
10/2/2019	NM	NM	NM	0	Well Damaged			0	7.61	38.76	6.05	3
10/16/2019	NM	NM	NM	0	Well Damaged			0	5.21	38.67	6.14	3
10/31/2019	NM	NM	NM	0	Well Damaged			0	5.21	38.67	6.14	3
11/15/2019	NM	NM	NM	0	Well Damaged			0	4.81	38.12	6.69	2
12/3/2019	NM	NM	NM	0	Well Damaged			0	6.46	39.27	5.54	3
12/18/2019	NM	NM	NM	0	Well Damaged			0	6.51	41.7	3.11	0
12/30/2019	NM	NM	NM	0	Well Damaged			0	6.99	43.5	1.31	0
1/7/2020	--	--	--	--	--		--	--	--	--	--	--
1/15/2020	NM	NM	NM	0	Well Damaged			0	5.12	38.99	5.82	0
1/27/2020	NM	NM	NM	0	Well Damaged			0	3.41	40.7	4.11	0
2/13/2020	NM	NM	NM	0	Well Damaged			0	5.1	40.12	4.69	0
2/25/2020	NM	NM	NM	0	Well Damaged			0	4.5	41.12	3.69	0
3/13/2020	NM	NM	NM	0	Well Damaged			0	6.06	42.12	2.69	0
3/31/2020	NM	NM	NM	0	17.49	ND	0	0	6.82	42.12**	2.69	2
4/9/2020	NM	NM	NM	0	17.63	ND	0	0	6.47	BP	NM	2
4/27/2020	NM	NM	NM	0	17.89	ND	0	0	8.01	BP	NM	2
5/14/2020	NM	NM	NM	0	18.29	ND	0	0	8.71	42.1	2.71	3.5
5/28/2020	NM	NM	NM	0	18.31	ND	0	0	8.08	BP	NM	3.5
6/11/2020	NM	NM	NM	0	18.51	ND	0	0	8.01	41.59	3.22	2
6/25/2020	NM	NM	NM	0	17.66	ND	0	0	7.52	BP	NM	2
7/9/2020	NM	NM	NM	0	18.22	ND	0	0	7.29	BP	NM	2
7/23/2020	NM	NM	NM	0	18.36	ND	0	0	7.49	BP	NM	2.5
8/6/2020	NM	NM	NM	0	17.66	ND	0	0	5.64	BP	NM	1.3
8/20/2020	NM	NM	NM	0	18.02	ND	0	0	7.38	BP	NM	0.5
9/2/2020	NM	NM	NM	0	18.2	ND	0	0	8.11	BP	NM	0.8
9/17/2020	NM	NM	NM	0	18.56	ND	0	0	8.81	BP	NM	1
10/1/2020	NM	NM	NM	0	18.29	ND	0	0	6.39	BP	NM	0.8
10/14/2020	NM	NM	NM	0	18.31	ND	0	0	8.71	BP	NM	2
10/28/2020	NM	NM	NM	0	18.61	ND	0	0	8.51	BP	NM	1.5
11/12/2020	NM	NM	NM	0	18.71	ND	0	0	8.49	BP	NM	0.5
11/23/2020	NM	NM	NM	0	18.97	ND	0	0	8.84	BP	NM	0
12/10/2020	NM	NM	NM	0	18.62	ND	0	0	5.31	BP	NM	1.5
12/21/2020	NM	NM	NM	0	18.01	ND	0	0	4.42	BP	NM	1
1/7/2021	NM	NM	NM	0	17.52	ND	0	0	4.48	BP	NM	1.5
1/21/2021	NM	NM	NM	0	17.39	ND	0	0	4.59	BP	NM	2
2/4/2021	NM	NM	NM	0	17.22	ND	0	0	5.62	BP	NM	1.5
2/23/2021	NM	NM	NM	0	17.04	ND	0	0	4.58	BP	NM	1
3/11/2021	NM	NM	NM	0	16.98	ND	0	0	4.22	BP	NM	1.5
3/25/2021	NM	NM	NM	0	17.01	ND	0	0	5.13	BP	NM	1.0
4/8/2021	NM	NM	NM	0	17.22	ND	0	0	6.63	BP	NM	1.0
4/22/2021	NM	NM	NM	0	17.41	ND	0	0	7.64	BP	NM	1.0
5/4/2021	NM	NM	NM	0	17.57	ND	0	0	5.96	BP	NM	1.0
5/20/2021	NM	NM	NM	0	16.51	ND	0	0	5.62	BP	NM	1.0

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-33BR				MW-34C/MW-34CR (July 2014)				MW-41B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/3/2021	NM	NM	NM	0	15.81	ND	0	0	4.41	BP	NM	1.0
6/17/2021	NM	NM	NM	0	16.74	ND	0	0	5.81	BP	NM	1.0
7/1/2021	NM	NM	NM	0	15.71	ND	0	0	4.36	BP	NM	1.0
7/19/2021	NM	NM	NM	0	15.49	ND	0	0	4.11	BP	NM	1.0
7/29/2021	NM	NM	NM	0	15.98	ND	0	0	6.51	BP	NM	1.0
8/12/2021	NM	NM	NM	0	16.58	ND	0	0	8.01	BP	NM	1.0
8/26/2021	NM	NM	NM	0	17.11	ND	0	0	8.04	BP	NM	1.0
9/10/2021	NM	NM	NM	0	17.56	ND	0	0	8.25	BP	NM	0.3
9/22/2021	5.32	ND	0	0	17.32	ND	0	0	5.66	BP	NM	0
10/8/2021	1.53	ND	0	0	NM	NM	NM	0	1.34	43.68	1.13	0.0
10/20/2021	1.98	ND	0	0	17.68	ND	0	0	5.98	43.01	1.80	0.0
11/4/2021	3.56	ND	0	0	NM	NM	NM	0	5.08	42.00	2.81	0.3
11/18/2021	NM	NM	NM	0	NM	NM	NM	0	5.92	BP	NM	0.0
12/3/2021	3.7	ND	0	0	NM	NM	NM	0	6.57	BP	NM	0.0
12/16/2021	4.6	ND	0	0	17.6	ND	0	0	6.63	BP	NM	0.0
12/30/2021	4.29	ND	0	0	17.52	ND	0	0	5.21	BP	NM	0.0
1/14/2022	4.36	ND	0	0	17.58	ND	0	0	5.34	ND	Trace	0.0
1/26/2022	4.43	ND	0	0	17.66	ND	0	0	5.42	ND	Trace	0.0
2/10/2022	4.3	ND	0	0	17.3	ND	0	0	4.61	41.55	3.26	0.3
2/24/2022	4.25	ND	0	0	17.42	ND	0	0	5.6	41.55	3.26	0.2
3/10/2022	NM	NM	NM	0	17.48	ND	0	0	5.59	41.58	3.23	0.3
3/24/2022	5.08	ND	0	0	17.72	ND	0	0	5.06	BP	NM	Trace
4/7/2022	4.80	ND	0	0	17.40	ND	0	0	5.80	BP	NM	0.1
4/18/2022	5.16	ND	0	0	17.86	ND	0	0	6.03	BP	NM	1.0
5/2/2022	5.40	ND	0	0	18.10	ND	0	0	6.24	BP	NM	1.0
5/20/2022	5.46	ND	0	0	18.02	ND	0	0	6.13	BP	NM	1.0
6/2/2022	5.61	ND	0	0	18.12	ND	0	0	6.29	BP	NM	1.0
6/16/2022	5.82	ND	0	0	18.21	ND	0	0	9.23	BP	NM	1.0
6/30/2022	5.87	ND	0	0	18.39	ND	0	0	9.37	BP	NM	1.0
7/15/2022	6.81	ND	0	0	19.27	ND	0	0	6.54	BP	NM	1.0
7/28/2022	6.94	ND	0	0	19.39	ND	0	0	6.67	BP	NM	1.0
8/12/2022	7.68	ND	0	0	20.00	ND	0	0	1.00	BP	NM	0.25
8/29/2022	NM	NM	NM	0	19.81	ND	0	0	6.47	BP	NM	0.5
9/16/2022	5.70	ND	0	0	19.45	ND	0	0	8.00	BP	NM	0.5
9/30/2022	NM	NM	NM	0	19.60	ND	0	0	9.10	42.50	2.31	1.0
10/17/2022	6.90	ND	0	0	19.93	ND	0	0	9.88	BP	NM	0.25
10/27/2022	7.02	ND	0	0	20.06	ND	0	0	10.13	BP	NM	0.25
11/10/2022	6.91	ND	0	0	19.92	ND	0	0	10.02	BP	NM	0.25
11/30/2022	5.24	ND	0	0	17.52	ND	0	0	6.12	BP	NM	0.25
12/16/2022	5.17	ND	0	0	17.39	ND	0	0	6.02	BP	NM	0.25
12/27/2022	5.46	ND	0	0	17.58	ND	0	0	6.34	BP	NM	0.25
1/13/2023	5.86	ND	0	0	18.13	ND	0	0	6.63	BP	NM	0.25
1/27/2023	3.88	ND	0	0	18.30	ND	0	0	4.55	BP	NM	1.00
2/9/2023	4.59	ND	0	0	18.12	ND	0	0	4.51	BP	NM	0.25
2/23/2023	NM	NM	NM	0	18.03	ND	0	0	5.35	BP	NM	0.25
3/9/2023	3.99	ND	0	0	17.91	ND	0	0	5.26	BP	NM	0.25
3/23/2023	4.99	ND	0	0	18.6	ND	0	0	6.41	BP	NM	0.50
4/6/2023	4.12	ND	0	0	17.74	ND	0	0	5.36	BP	NM	0.25
4/19/2023	4.93	ND	0	0	18.60	ND	0	0	5.41	BP	NM	0.25
5/5/2023	4.27	ND	0	0	17.89	ND	0	0	5.52	BP	NM	0.25
5/18/2023	2.34	ND	0	0	18.30	ND	0	0	4.23	BP	NM	0.25
6/1/2023	3.66	ND	0	0	17.87	ND	0	0	7.12	BP	NM	0.5
6/15/2023	4.43	ND	0	0	18.03	ND	0	0	7.14	BP	NM	0.25
6/29/2023	5.32	ND	0	0	18.60	ND	0	0	8.34	BP	NM	0.25
Total DNAPL Pumped (gal)				***0.0***				***0.0***				***282.9***

Notes:

* - indicates DNAPL and groundwater mixture

** - indicates DTD from previous event was used

--- - No DNAPL pumped

DTW - Depth to water (feet Below Top of Casing (BTOC))

DTD - Depth to DNAPL (feet BTOC)

BP - Below pump; depth to DNAPL not measured because DNAPL is below top of in-well pump

ND - Not detected

NM - Not measured

PoP - Product on probe, not measureable

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-44C				MW-45C				MW-46C			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	18.96	62.95	7.85	1	21.26	69.9	0.7	0.3	21.07	71.3	1.6	0.3
4/3/2013	19.34	70.47	0.33	0.3*	21.39	70.39	0.21	0.3*	20.61	72.36	0.54	0.3*
4/22/2013	18.62	70.64	0.16	0.3*	21.03	70.47	0.13	0.3*	20.61	72.61	0.29	0.3*
5/30/2013	18.43	70.01	0.79	0.3*	21.16	70.25	0.35	0.3*	20.59	71.61	1.29	0.3*
6/29/2013	19.34	70.32	0.48	0.3	21.93	70.32	0.28	0.3*	21.09	72.34	0.56	0.3*
7/22/2013	20.36	70.26	0.54	0.3	22.72	70.39	0.21	0.3*	21.96	72.16	0.74	0.3*
8/26/2013	20.62	70.39	0.41	0.3	22.86	70.31	0.29	0.3	22.23	72.32	0.58	0.3
9/27/2013	20.39	70.61	0.19	0.3	22.66	70.17	0.43	0.3	22.09	72.09	0.81	0.3
10/31/2013	20.17	70.75	0.05	0.1	22.59	70.42	0.18	0.1	22.41	72.34	0.56	0.2
11/27/2013	20.09	70.78	0.02	0.0	22.52	70.49	0.11	0	22.31	72.47	0.43	0.1
12/31/2013	20.01	70.8	PoP	0.0	22.39	70.46	0.14	0	22.03	72.53	0.37	0.1
1/30/2014	19.67	70.42	0.38	0.3	22.13	70.35	0.25	0	21.81	72.55	0.35	0.1
3/3/2014	19.29	70.17	0.63	0.3	21.86	70.09	0.51	0	21.57	72.05	0.85	0.3
3/31/2014	19.17	70.02	0.78	0.3	21.71	69.63	0.97	0.3	21.43	72.12	0.78	0.1
4/30/2014	19.02	69.81	0.99	0.3	21.59	69.74	0.86	0.3	21.27	71.81	1.09	0.3
5/27/2014	18.92	69.71	1.09	0.0	21.52	69.67	0.93	0.3	21.34	71.71	1.19	0.3
6/26/2014	18.81	69.52	1.28	0.3	21.59	69.77	0.83	0.3	21.17	71.6	1.3	0.3
7/31/2014	18.66	69.37	1.43	0.3	21.21	69.96	0.64	0.3	20.39	71.43	1.47	0.3
8/27/2014	18.53	69.47	1.33	0.3	21.13	70.12	0.48	0.3	20.22	71.61	1.29	0.3
10/3/2014	18.41	69.23	1.57	0.3	20.13	70.41	0.19	0.3	20.14	71.39	1.51	0.3
11/3/2014	18.52	69.37	1.43	0.3	20.29	70.36	0.24	0.3	20.27	71.47	1.43	0.3
11/24/2014	18.57	69.49	1.31	0.5	20.34	70.48	0.12	0.3	20.38	71.53	1.37	0.5
12/22/2014	18.51	69.31	1.49	0.5	20.31	70.41	0.19	0.3	20.37	71.42	1.48	0.5
1/29/2015	18.39	69.39	1.41	0.5	20.17	70.51	0.09	0.3	20.13	71.48	1.42	0.5
2/26/2015	18.42	69.51	1.29	0.5	20.11	70.59	0.01	0	20.09	71.38	1.52	0.5
3/26/2015	18.39	69.42	1.38	0.3	19.26	70.52	0.08	0	20.17	71.02	1.88	0.3
4/27/2015	18.29	69.52	1.28	0.5	20.17	70.48	0.12	0.3	20.22	71.56	1.34	1.0
5/26/2015	18.17	69.57	1.23	0.8	20.12	70.41	0.19	0.3	20.12	71.61	1.29	1.0
7/6/2015	16.29	69.86	0.94	0.5	18.07	70.49	0.11	0.3	18.17	71.93	0.97	0.8
8/3/2015	16.18	69.82	0.98	0.5	18.16	70.56	0.04	Trace*	18.24	71.98	0.92	0.8
8/27/2015	17.46	69.74	1.06	0.3	19.03	70.54	0.06	Trace*	19.39	72.03	0.87	0.5
10/5/2015	16.83	69.86	0.94	0.3	18.39	ND	0	0	18.72	72.34	0.56	0.5
11/5/2015	16.62	69.79	1.01	0.3	17.96	ND	0	0	18.51	72.26	0.64	0.5
12/3/2015	16.46	69.73	1.07	0.3	17.72	ND	0	0	18.62	72.36	0.54	0.5
12/28/2015	16.32	69.77	1.03	0.3	17.62	ND	0	0	18.42	72.31	0.59	0.5
2/3/2016	16.17	69.74	1.06	0.3	17.42	ND	0	0	18.29	72.46	0.44	0.3
3/3/2016	16.12	69.79	1.01	0.3	17.39	ND	0	0	18.23	72.49	0.41	0.3
3/31/2016	16.06	69.71	1.09	0.3	17.33	ND	0	0	18.24	72.54	0.36	0.3
5/3/2016	16.27	69.59	1.21	0.3	17.47	ND	0	0	18.39	72.39	0.51	0.3
6/2/2016	16.38	69.63	1.17	0.3	17.52	ND	0	0	18.43	72.43	0.47	0.3
7/8/2016	16.47	69.71	1.09	0.3	17.62	ND	0	0	18.54	72.49	0.41	0.3
8/3/2016	16.59	69.7	1.1	0.3	17.69	ND	0	0	18.51	72.53	0.37	0.3
8/30/2016	16.67	69.58	1.22	0.3	17.76	ND	0	0	18.72	72.57	0.33	0.3
9/30/2016	16.79	69.49	1.31	0.5	17.86	ND	0	0	18.83	72.46	0.44	0.3
11/3/2016	16.86	69.71	1.09	0.5	17.92	ND	0	0	18.89	72.41	0.49	0.3
11/30/2016	17.03	69.94	0.86	0.8	18.09	ND	0	0	19.12	72.32	0.58	0.3
1/4/2017	17.22	70.11	0.69	0.8	18.22	ND	0	0	19.27	72.46	0.44	0.3
2/7/2017	17.29	70.01	0.79	0.5	18.17	ND	0	0	19.19	72.39	0.51	0.3
3/2/2017	17.17	70.16	0.64	0.5	17.96	ND	0	0	19.03	72.31	0.59	0.3
4/3/2017	17.06	70.21	0.59	0	17.89	ND	0	0	18.97	72.39	0.51	0.3
4/27/2017	17.01	70.29	0.51	0	17.67	ND	0	0	18.84	72.31	0.59	0.5
5/29/2017	17.23	70.24	0.56	0.3	17.84	ND	0	0	18.94	72.47	0.43	0.3
7/5/2017	17.33	70.34	0.46	0.3	17.96	ND	0	0	19.12	72.34	0.56	0.5
8/1/2017	17.39	70.39	0.41	0.3	18.09	ND	0	0	19.23	72.27	0.63	0.5
9/5/2017	17.36	70.43	0.37	0.3	18.16	ND	0	0	19.29	72.34	0.56	0.5
10/4/2017	17.31	70.41	0.39	0.3	18.21	ND	0	0	19.36	72.3	0.6	0.5
11/2/2017	17.42	70.4	0.4	0.3	18.32	ND	0	0	19.42	72.36	0.54	0.5
11/29/2017	17.49	70.36	0.44	0.3	18.43	ND	0	0	19.57	72.34	0.56	0.5
1/2/2018	17.67	70.31	0.49	0.5	18.73	ND	0	0	19.81	72.39	0.51	0.5
2/7/2018	17.77	70.34	0.46	0.5	18.62	ND	0	0	19.96	72.46	0.44	0.5
3/1/2018	NM	NM	NM	0	18.79	ND	0	0	20.02	72.32	0.58	0.5
4/2/2018	NM	NM	NM	0	18.72	ND	0	0	19.81	72.39	0.51	0.5
5/1/2018	NM	NM	NM	0	19.31	ND	0	0	20.62	72.46	0.44	1

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-44C				MW-45C				MW-46C			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/1/2018	18.31	70.17	0.63	0.8	19.47	ND	0	0	20.87	72.51	0.39	1
6/29/2018	18.79	70.39	0.41	0.8	19.67	ND	0	0	20.97	72.57	0.33	1
8/3/2018	18.97	70.36	0.44	0.8	19.77	ND	0	0	21.11	72.59	0.31	1
8/31/2018	18.87	70.39	0.41	0.5	19.41	ND	0	0	20.96	72.48	0.42	0.5
9/28/2018	18.82	70.41	0.39	0.8	19.32	ND	0	0	20.91	72.43	0.47	0.5
11/2/2018	18.67	70.44	0.36	0.8	19.26	ND	0	0	20.77	72.39	0.51	0.8
11/29/2018	18.47	70.46	0.34	0.3	19.16	ND	0	0	20.52	72.34	0.56	0.5
1/2/2019	18.42	70.41	0.39	0.5	19.02	ND	0	0	20.49	72.46	0.44	0.5
2/2/2019	18.29	70.41	0.39	0.5	18.93	ND	0	0	20.43	72.49	0.41	0.5
2/28/2019	18.16	70.42	0.38	0.5	18.77	ND	0	0	20.34	72.37	0.53	0.5
4/2/2019	18.09	70.39	0.41	0.5	18.71	ND	0	0	20.18	72.32	0.58	0.5
4/25/2019	18.02	70.16	0.64	0.5	18.63	ND	0	0	20.14	72.36	0.54	0.5
5/29/2019	18.61	70.23	0.57	0.5	18.47	ND	0	0	20.06	72.39	0.51	0.5
6/12/2019	18.29	ND	Trace	0	18.81	ND	0	0	18.02	ND	Trace	0
6/30/2019	18.16	ND	0	0	18.71	ND	0	0	18.09	ND	0	0
7/16/2019	18.09	ND	0	0	18.66	ND	0	0	18.12	ND	0	0
8/2/2019	18.17	ND	0	0	18.72	ND	0	0	18.17	ND	0	0
8/15/2019	18.22	ND	0	0	18.79	ND	0	0	18.09	ND	0	0
8/28/2019	18.29	ND	0	0	18.86	ND	0	0	18.17	ND	0	0
9/17/2019	18.39	ND	0	0	18.97	ND	0	0	18.23	ND	0	0
10/2/2019	18.32	ND	0	0	18.89	ND	0	0	18.17	ND	0	0
10/16/2019	15.06	ND**	0	0	16.23	ND	0	0	16.34	ND	0	0
10/31/2019	14.89	ND**	0	0	15.94	ND	0	0	16.06	ND	0	0
11/15/2019	14.21	ND**	0	0	15.69	ND	0	0	15.81	ND	0	0
12/3/2019	16.11	ND**	0	0	15.71	ND	0	0	15.91	ND	0	0
12/18/2019	16.51	ND**	0	0	15.91	ND	0	0	16.11	ND	0	0
12/30/2019	16.65	ND**	0	0	16.11	ND	0	0	16.22	ND	0	0
1/7/2020	--	--	--	--	--	--	--	--	--	--	--	--
1/15/2020	16.61	ND**	0	0	16.11	ND	0	0	16.29	ND	0	0
1/27/2020	16.24	ND**	0	0	15.71	ND	0	0	16.15	ND	0	0
2/13/2020	15.81	ND**	0	0	15.29	ND	0	0	14.4	ND	0	0
2/25/2020	15.81	ND**	0	0	15.28	ND	0	0	15.42	ND	0	0
3/13/2020	15.84	ND**	0	0	15.31	ND	0	0	15.57	ND	0	0
3/31/2020	14.82	ND**	0	0	15.59	ND	0	0	15.72	ND	0	0
4/9/2020	22.76	ND**	0	0	15.67	ND	0	0	15.89	ND	0	0
4/27/2020	14.67	ND**	0	0	15.94	ND	0	0	16.12	ND	0	0
5/14/2020	14.21	ND**	0	0	16.38	69.3	1.30	0.1	16.51	ND	0	0
5/28/2020	12.06	57.61	0.39**	0	16.46	70	0.6	0	16.71	ND	0	0
6/11/2020	11.61	ND**	0	0	16.68	ND	0	0	16.83	ND	0	0
6/25/2020	10.37	ND**	0	0	14.99	ND	0	0	15.12	ND	0	0
7/9/2020	11.51	ND**	0	0	16.28	ND	0	0	16.51	ND	0	0
7/23/2020	16.92	ND**	0	0	16.49	69.7	0.90	Trace	16.49	ND	0	0
8/6/2020	16.75	ND**	0	0	16.19	ND	0	0	16.47	ND	0	0
8/20/2020	16.71	ND**	0	0	16.18	ND	0	0	16.35	ND	0	0
9/2/2020	16.84	ND**	0	0	16.21	ND	0	0	16.51	ND	0	0
9/17/2020	17.29	ND**	0	0	16.71	ND	0	0	16.85	ND	0	0
10/1/2020	16.84	ND**	0	0	16.61	ND	0	0	16.64	ND	0	0
10/14/2020	16.92	ND**	0	0	16.39	ND	0	0	16.58	ND	0	0
10/28/2020	17.11	ND**	0	0	16.58	70.6	Trace	Trace	16.74	ND	0	0
11/12/2020	17.42	ND**	0	0	16.83	ND	0	0	17.04	ND	0	0
11/23/2020	1769	ND**	0	0	17.12	ND	0	0	17.33	ND	0	0
12/10/2020	17.01	ND**	0	0	16.50	ND	0	0	16.71	ND	0	0
12/21/2020	16.69	ND**	0	0	16.02	69.04	1.56	0.3	16.22	ND	0	0
1/7/2021	15.91	ND**	0	0	15.59	ND	0	0	15.81	ND	0	0
1/21/2021	15.77	ND**	0	0	15.2	70.5	0.1	Trace	15.44	ND	0	0
2/4/2021	15.69	ND**	0	0	15.19	70.55	0.05	Trace	15.39	ND	0	0
2/23/2021	14.55	ND**	0	0	14.99	70.21	0.39	Trace	15.24	ND	0	0
3/11/2021	15.49	ND**	0	0	14.98	ND	0	0	15.21	ND	0	0
3/25/2021	15.5	ND**	0	0	14.99	ND	0	0	15.18	ND	0	0
4/8/2021	15.59	ND**	0	0	15.19	ND	0	0	15.41	ND	0	0
4/22/2021	16.09	ND**	0	0	15.52	ND	0	0	15.77	ND	0	0
5/4/2021	Well Damaged			0	14.58	ND	0	0	14.74	ND	0	0
5/20/2021	Well Damaged			0	15.58	ND	0	0	15.75	ND	0	0

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-44C				MW-45C				MW-46C			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/3/2021	Well Damaged			0	14.96	ND	0	0	15.21	ND	0	0
6/17/2021	Well Damaged			0	15.76	ND	0	0	15.08	ND	0	0
7/1/2021	Well Damaged			0	14.59	69.79	0.81	0.3	14.81	ND	0	0
7/19/2021	Well Damaged			0	14.05	69.42	1.18	0.3	14.26	ND	0	0
7/29/2021	Well Damaged			0	14.05	69.71	0.89	0.1	14.29	ND	0	0
8/12/2021	Well Damaged			0	14.68	70.36	0.24	Trace	14.84	ND	0	0
8/26/2021	Well Damaged			0	15.21	ND	0	0	15.43	ND	0	0
9/10/2021	Well Damaged			0	15.63	ND	0	0	15.82	ND	0	0
9/22/2021	Well Damaged			0	15.71	ND	0	0	15.89	ND	0	0
10/8/2021	Well Damaged			0	15.47	ND	0	0	15.83	ND	0	0
10/20/2021	Well Damaged			0	15.88	ND	0	0	15.98	ND	0	0
11/4/2021	Well Damaged			0	15.31	68.61	1.99	0	15.51	ND	0	0
11/18/2021	Well Damaged			0	15.31	ND	0	0	15.51	ND	0	0
12/3/2021	Well Damaged			0	15.51	ND	0	0	15.72	ND	0	0
12/16/2021	Well Damaged			0	15.68	ND	0	0	16.02	ND	0	0
12/30/2021	Well Damaged			0	15.61	ND	Trace	0	15.62	ND	Trace	0
1/14/2022	Well Damaged			0	15.72	ND	Trace	0	15.81	ND	Trace	0
1/26/2022	Well Damaged			0	15.83	ND	Trace	0	15.96	ND	Trace	0
2/10/2022	Well Damaged			0	15.33	ND	0	0	15.56	ND	0	0
2/24/2022	Well Damaged			0	15.58	69.83	0.67	0	15.78	ND	0	0
3/10/2022	Well Damaged			0	15.58	69.71	0.79	0.3	15.83	ND	0	0
3/24/2022	Well Damaged			0	16.08	ND	0	0	16.20	ND	0	0
4/7/2022	Well Damaged			0	16.15	ND	0	0	16.34	ND	0	0
4/18/2022	Well Damaged			0	16.29	ND	0	0	16.59	ND	0	0
5/2/2022	Well Damaged			0	16.43	ND	0	0	16.61	ND	0	0
5/20/2022	Well Damaged			0	16.29	ND	0	0	16.52	ND	0	0
6/2/2022	Well Damaged			0	16.42	ND	0	0	16.74	ND	0	0
6/16/2022	Well Damaged			0	NM	NM	NM	0	17.33	ND	0	0
6/30/2022	Well Damaged			0	NM	NM	NM	0	17.72	ND	0	0
7/15/2022	Well Damaged			0	17.98	ND	0	0	18.21	ND	0	0
7/28/2022	Well Damaged			0	18.06	ND	0	0	18.41	ND	0	0
8/12/2022	Well Damaged			0	NM	NM	NM	0	18.00	ND	0	0
8/29/2022	Well Damaged			0	18.57	ND	0	0	19.42	ND	0	0
9/16/2022	Well Damaged			0	17.35	ND	Trace	0	17.60	ND	0	0
9/30/2022	Well Damaged			0	17.65	ND	Trace	0	17.85	ND	0	0
10/17/2022	Well Damaged			0	18.95	ND	0	0	18.12	ND	0	0
10/27/2022	Well Damaged			0	19.03	ND	0	0	18.22	ND	0	0
11/10/2022	Well Damaged			0	18.76	ND	0	0	18.76	ND	0	0
11/30/2022	Well Damaged			0	16.46	ND	0	0	15.79	ND	0	0
12/16/2022	Well Damaged			0	16.52	ND	0	0	15.71	ND	0	0
12/27/2022	Well Damaged			0	16.74	ND	0	0	16.12	ND	0	0
1/13/2023	Well Damaged			0	17.13	ND	0	0	16.49	ND	0	0
1/27/2023	Well Damaged			0	16.45	ND	0	0	16.62	ND	0	0
2/9/2023	Well Damaged			0	16.05	ND	0	0	16.22	ND	0	0
2/23/2023	Well Damaged			0	16.11	ND	0	0	16.25	ND	0	0
3/9/2023	Well Damaged			0	15.96	ND	0	0	16.18	ND	0	0
3/23/2023	Well Damaged			0	16.57	ND	0	0	16.69	ND	0	0
4/6/2023	Well Damaged			0	16.07	ND	0	0	16.31	ND	0	0
4/19/2023	Well Damaged			0	16.04	ND	0	0	16.14	ND	0	0
5/5/2023	Well Damaged			0	16.22	ND	0	0	16.39	ND	0	0
5/18/2023	Well Damaged			0	13.02	ND	0	0	16.05	ND	0	0
6/1/2023	Well Damaged			0	17.9	ND	0	0	16.05	ND	0	0
6/15/2023	Well Damaged			0	16.15	ND	0	0	16.32	ND	0	0
6/29/2023	Well Damaged			0	16.55	ND	Trace	0	16.78	ND	Trace	0
Total DNAPL Pumped (gal)				***26.7***				***7.1***				***31.8***

Notes:

* - indicates DNAPL and groundwater mixture

--- - No DNAPL pumped

DTW - Depth to water (feet Below Top of Casing (BTOC))

DTD - Depth to DNAPL (feet BTOC)

ND - Not detected

NM - Not measured

PoP - Product on probe, not measureable

MW-44C not measured 3/1/18 - 5/1/18; couldn't locate well due to construction. MW-45C not measured 6/16/22-6/30/22; couldn't locate well

**Total depth measured in MW-44C was approximately 10 ft higher than during previous events - attempted to remove silt in July and October 2020.

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-49A				MW-49B				MW-57A			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013									10.56	22.12	4.78	0.5
4/3/2013									10.32	24.79	2.11	0.5
4/22/2013									10.71	25.85	1.05	0.5
5/30/2013									10.63	24.16	2.74	0.5
6/29/2013									12.16	23.82	3.08	2
7/22/2013					11.83	33.91	0.84	--	13.21	23.05	3.85	2
8/26/2013									12.91	25.32	1.58	1
9/27/2013									12.72	25.71	1.19	0.8
10/31/2013									12.72	25.92	0.98	1
11/27/2013									12.61	25.98	0.92	1
12/31/2013									12.46	26.09	0.81	1
1/30/2014									11.79	26.15	0.75	0.3
3/3/2014									11.02	26.25	0.65	0.3
3/31/2014									10.83	26.41	0.49	0.3
4/30/2014									10.71	26.31	0.59	0.3
5/27/2014									10.74	26.16	0.74	0.3
6/26/2014									10.61	26.29	0.61	0.3
7/31/2014									10.35	26.18	0.72	0.3
8/27/2014									10.22	26.26	0.64	0.3
10/3/2014									10.09	26.04	0.86	0.3
11/3/2014									10.17	26.16	0.74	0.3
11/24/2014									10.13	26.29	0.61	0.3
12/22/2014									10.06	26.34	0.56	0.3
1/29/2015									9.73	26.51	0.39	0.3
2/26/2015									9.87	26.42	0.48	0.3
3/26/2015									9.81	26.32	0.58	0.3
4/27/2015									9.82	26.47	0.43	0.5
5/26/2015									9.71	26.56	0.34	0.5
7/6/2015									7.41	26.82	0.08	Trace*
8/3/2015									7.29	26.86	0.04	Trace*
8/27/2015									8.11	ND	0	Trace*
10/5/2015									7.72	ND	0	0
11/5/2015									7.39	ND	0	0
12/3/2015									7.13	ND	0	0
12/28/2015									NM	NM	NM	0
2/3/2016									NM	NM	NM	0
3/3/2016									NM	NM	NM	0
3/31/2016									NM	NM	NM	0
5/3/2016									NM	NM	NM	0
6/2/2016									7.26	ND	0	0
7/8/2016									7.39	ND	0	0
8/3/2016									7.46	ND	0	0
8/30/2016									7.58	ND	0	0
9/30/2016									7.69	ND	0	0
11/3/2016									7.77	ND	0	0
11/30/2016									7.92	ND	0	0
1/4/2017									8.07	ND	0	0
2/7/2017									8.18	ND	0	0
3/2/2017									8.02	ND	0	0
4/3/2017									8.06	ND	0	0
4/27/2017									8.01	ND	0	0
5/29/2017									8.34	ND	0	0
7/5/2017									8.41	ND	0	0
8/1/2017									8.52	ND	0	0
9/5/2017									8.46	ND	0	0
10/4/2017									8.41	ND	0	0
11/2/2017									8.52	ND	0	0
11/29/2017									8.67	ND	0	0
1/2/2018									8.91	ND	0	0
2/7/2018									8.98	ND	0	0
3/1/2018									9.22	ND	0	0
4/2/2018									9.16	ND	0	0
5/1/2018									9.34	ND	0	0

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-49A				MW-49B				MW-57A			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/1/2018									9.67	ND	0	0
6/29/2018									9.87	ND	0	0
8/3/2018									10.02	ND	0	0
8/31/2018									9.91	ND	0	0
9/28/2018									9.86	ND	0	0
11/2/2018									9.77	ND	0	0
11/29/2018									9.56	ND	0	0
1/2/2019									9.52	ND	Trace	0
2/2/2019									9.41	ND	Trace	0
2/28/2019									9.32	ND	Trace	0
4/2/2019									9.27	ND	Trace	0
4/25/2019									9.16	ND	Trace	0
5/29/2019									9.06	ND	Trace	0
6/12/2019									9.39	ND	0	0
6/30/2019									9.21	ND	0	0
7/16/2019					12.02	34.62	0.24	--	9.17	ND	0	0
8/2/2019									9.22	ND	0	0
8/15/2019									9.29	ND	0	0
8/28/2019									9.33	ND	0	0
9/17/2019									9.46	ND	0	0
10/2/2019									9.74	ND	0	0
10/16/2019									10.39	ND	0	0
10/31/2019									11.92	ND	0	0
11/15/2019									11.14	ND	0	0
12/3/2019									13.75	ND	0	0
12/18/2019									14.09	ND	0	0
12/30/2019									14.42	ND	0	0
1/7/2020					11.51	20.09	14.77	--	--	--	--	--
1/15/2020					15.48	20.89	13.97	2.5	12.79	ND	0	0
1/27/2020					14.2	22.4	12.46	2	11.61	ND	0	0
2/13/2020					13.31	28.9	5.96	1.5	13.22	ND	0	0
2/25/2020					11.51	26.8	8.06	1.0	12.31	ND	0	0
3/13/2020					11.73	26.1	8.76	0.5	13.71	ND	0	0
3/31/2020					13.72	29.39	5.47	0.5	13.85	ND	0	0
4/9/2020					14.13	31.04	3.82	0.5	13.36	ND	0	0
4/27/2020					15.31	32.05	2.81	0.1	14.45	ND	0	0
5/14/2020					14.95	31.89	2.97	0.1	14.84	ND	0	0
5/28/2020					13.66	31.07	3.79	0.5	13.91	ND	0	0
6/11/2020					14.56	31.22	3.64	0.3	14.41	ND	0	0
6/25/2020					10.65	31.64	3.22	0.3	14.08	ND	0	0
7/9/2020					10.51	32.41	2.45	0.5	13.51	ND	0	0
7/23/2020					13.51	31.13	3.73	0.5	13.26	ND	0	0
8/6/2020					13.23	32.48	2.38	0.3	11.53	ND	0	0
8/20/2020					12.11	32.08	2.78	0.1	13.11	ND	0	0
9/2/2020					13.58	31.04	3.82	0.8	13.91	ND	0	0
9/17/2020					15.91	30.24	4.62	0.5	14.43	ND	0	0
10/1/2020					13.63	31.11	3.75	0.8	12.41	ND	0	0
10/14/2020					12.18	29.6	5.26	2.0	13.74	ND	0	0
10/28/2020					13.71	31.93	2.93	1.0	13.91	ND	0	0
11/12/2020					12.74	32.03	2.83	0.5	14.64	ND	0	0
11/23/2020					12.08	32.30	2.56	0.3	14.99	ND	0	0
12/10/2020					8.66	31.21	3.65	0.3	12.31	ND	0	0
12/21/2020					6.6	30.72	4.14	0.5	10.92	ND	0	0
1/7/2021					6.41	32.25	2.61	0.5	12.51	ND	0	0
1/21/2021					15.44	31.25	3.61	0.5	12.54	ND	0	0
2/4/2021					15.81	31.54	3.32	0.5	13.15	ND	0	0
2/23/2021					13.44	31.2	3.66	0.5	12.32	ND	0	0
3/11/2021					11.91	31.96	2.9	0.5	13.13	ND	0	0
3/25/2021					10.28	32.41	2.45	0.5	13.01	ND	0	0
4/8/2021					10.79	31.79	3.07	0.5	13.71	ND	0	0
4/22/2021					11.29	32.08	2.78	0.5	14.31	ND	0	0
5/4/2021					7.94	32.4	2.46	0.3	13.03	ND	0	0
5/20/2021					7.04	32.69	2.17	0.5	10.45	ND	0	0

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-49A				MW-49B				MW-57A			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/3/2021					4.81	32.6	2.26	0.5	11.15	ND	0	0
6/17/2021					6.39	32.8	2.06	Trace	12.21	ND	0	0
7/1/2021					4.51	ND	0	0	10.38	ND	0	0
7/19/2021					0.39	ND	0	0	9.79	ND	0	0
7/29/2021					12.91	ND	0	0	12.51	ND	0	0
8/12/2021					10.49	32.60	2.26	0.1	13.91	ND	0	0
8/26/2021					9.87	31.90	2.96	0.5	14.11	ND	0	0
9/10/2021					10.03	31.79	3.07	0.2	14.28	ND	0	0
9/22/2021					7.50	ND	0	0	13.21	ND	0	0
10/8/2021					7.56	ND	0	0	12.05	ND	0	0
10/20/2021					7.8	30.94	1.82	0.1	13.80	ND	0	0
11/4/2021					7.63	ND	0	0	12.45	ND	0	0
11/18/2021					8.00	ND	0	0	13.37	ND	0	0
12/3/2021					8.25	ND	0	0	13.81	ND	0	0
12/16/2021					8.52	ND	0	0	13.69	ND	0	0
12/30/2021					7.81	ND	0	0	13.36	ND	0	0
1/14/2022					7.92	ND	0	0	13.43	ND	0	0
1/26/2022					7.91	ND	0	0	13.56	ND	0	0
2/10/2022					11.38	30	2.76	0.3	12.71	ND	0	0
2/24/2022					12.6	ND	0	0	13.68	ND	0	0
3/10/2022					11.96	ND	0	0	14.40	ND	0	0
3/24/2022					12.20	ND	0	0	12.56	ND	0	0
4/7/2022					11.60	ND	0	0	13.70	ND	0	0
4/18/2022					11.32	ND	0	0	13.81	ND	0	0
5/2/2022					11.08	ND	0	0	13.99	ND	0	0
5/20/2022					11.17	ND	0	0	13.46	ND	0	0
6/2/2022					11.12	ND	0	0	13.34	ND	0	0
6/16/2022					10.97	ND	0	0	15.03	ND	0	0
6/30/2022					11.16	ND	0	0	15.48	ND	0	0
7/15/2022					8.73	ND	0	0	13.96	ND	0	0
7/28/2022					8.84	ND	0	0	14.06	ND	0	0
8/12/2022					11.11	ND	0	0	13.50	ND	0	0
8/29/2022					11.39	ND	NM	2	13.56	ND	0	0
9/16/2022					9.60	24.00	11.50	2.5	13.85	ND	0	0
9/30/2022					10.80	20.00	15.50	3.5	14.80	ND	0	0
10/17/2022					11.85	19.35	9.15	2.5	15.41	ND	0	0
10/27/2022					12.06	19.47	9.03	2.5	15.79	ND	0	0
11/10/2022					11.77	19.62	8.88	2.5	15.61	ND	0	0
11/30/2022					7.52	19.86	8.64	2.5	12.29	ND	0	0
12/16/2022					7.46	19.98	8.52	2.5	12.17	ND	0	0
12/27/2022					7.74	19.62	8.88	2.5	12.46	ND	0	0
1/13/2023					8.06	19.56	8.94	2.5	12.77	ND	0	0
1/27/2023					7.6	ND	Trace	0	11.92	ND	0	0
2/9/2023					9.4	24.80	3.70	0.5	12.5	ND	0	0
2/23/2023					10.33	26.37	2.13	1.0	13.98	ND	0	0
3/9/2023					10.21	26.22	2.28	1.0	13.91	ND	0	0
3/23/2023					10.06	25.00	3.50	1.0	13.78	ND	0	0
4/6/2023					10.71	16.94	11.56	2.0	13.77	ND	0	0
4/19/2023					7.55	19.64	8.86	2.0	13.09	ND	0	0
5/5/2023					9.48	22.79	5.71	1.5	13.61	ND	0	0
5/18/2023					4.9	20.82	7.68	2.0	10.28	ND	0	0
6/1/2023	9.25	28.40	2	0	8.65	25.70	2.80	1.3	13.05	ND	0	0
6/15/2023	9.27	27.22	3	1	7.88	24.15	4.35	0.75	13.11	ND	0	0
6/29/2023	9.63	28.39	0.5	0.1	9.00	24.45	3.75	1.0	13.81	ND	0	0
Total DNAPL Pumped (gal)				***1.1***				***63.4***				***15.5***

Notes:

* - indicates DNAPL and groundwater mixture

--- - No DNAPL pumped

DTW - Depth to water (feet Below Top of Casing (BTOC))

DTD - Depth to DNAPL (feet BTOC)

ND - Not detected

NM - Not measured

PoP - Product on probe, not measureable

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-57B				MW-68B				MW-70B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	28.56	41.41	1.54	0.3					6.57	34.09	1.61	0.3
4/3/2013	28.09	42.36	0.59	0.3*					6.79	35.26	0.44	0.3
4/22/2013	27.06	42.17	0.78	0.3					6.06	35.12	0.58	0.3
5/30/2013	27.13	41.63	1.32	0.3					6.19	34.67	1.03	0.3
6/29/2013	18.26	42.07	0.88	0.3					8.01	34.92	0.78	0.3*
7/22/2013	16.34	41.67	1.28	0.8					8.22	34.07	1.63	0.3*
8/26/2013	18.01	42.31	0.64	0.3					8.17	35.09	0.61	0.3
9/27/2013	17.74	42.51	0.39	0.3					8.32	35.34	0.36	0.3
10/31/2013	17.61	42.61	0.29	0.1					8.26	35.39	0.31	0.1
11/27/2013	17.54	42.67	0.23	0.1					8.12	35.42	0.28	0.1
12/31/2013	17.36	42.74	0.16	0.1					7.89	35.51	0.19	0.1
1/30/2014	17.04	ND	Trace	0					7.84	35.06	0.64	0.1
3/3/2014	16.51	ND	Trace	0					7.09	35.05	0.65	0.1
3/31/2014	16.41	ND	Trace	0					6.87	35.17	0.53	0.1
4/30/2014	16.29	ND	Trace	0					6.72	35.01	0.69	0.1
5/27/2014	16.13	ND	Trace	0					6.64	34.86	0.84	0.1
6/26/2014	16.02	ND	Trace	0					6.52	34.97	0.73	0.3
7/31/2014	15.84	ND	Trace	0					6.26	34.76	0.94	0.3
8/27/2014	15.71	ND	Trace	0					6.84	34.86	0.84	0.3
10/3/2014	15.61	ND	Trace	0					6.71	34.61	1.09	0.3
11/3/2014	NM	NM	NM	0					6.79	34.79	0.91	0.3
11/24/2014	NM	NM	NM	0					6.77	34.93	0.77	0.3
12/22/2014	NM	NM	NM	0					6.69	34.86	0.84	0.3
1/29/2015	NM	NM	NM	0					6.48	34.92	0.78	0.3
2/26/2015	NM	NM	NM	0					6.39	34.81	0.89	0.5
3/26/2015	NM	NM	NM	0					6.27	34.91	0.79	0.3
4/27/2015	NM	NM	NM	0					6.19	34.99	0.71	0.3
5/26/2015	NM	NM	NM	0					6.07	35.11	0.59	0.5
7/6/2015	NM	NM	NM	0					5.03	35.32	0.38	0.3
8/3/2015	12.32	ND	PoP	0					5.12	35.37	0.33	Trace*
8/27/2015	13.04	ND	0	0					6.31	35.41	0.29	Trace*
10/5/2015	12.62	ND	0	0					5.72	35.47	0.23	0.3
11/5/2015	12.27	ND	0	0					5.41	35.42	0.28	0.3
12/3/2015	12.02	ND	0	0					5.13	35.63	0.07	0.3
12/28/2015	NM	NM	NM	0					5.02	35.26	0.44	0.3
2/3/2016	NM	NM	NM	0					4.86	35.21	0.49	0.3
3/3/2016	NM	NM	NM	0					4.92	35.17	0.53	0.3
3/31/2016	NM	NM	NM	0					4.91	35.24	0.46	0.3
5/3/2016	NM	NM	NM	0					5.13	35.29	0.36	0.3
6/2/2016	12.32	ND	0	0					5.26	35.36	0.29	0.3
7/8/2016	12.44	ND	0	0					5.34	35.31	0.34	0.3
8/3/2016	12.52	ND	0	0					5.42	35.39	0.26	0.3
8/30/2016	12.67	ND	0	0					5.61	35.21	0.44	0.3
9/30/2016	12.81	ND	0	0					5.74	35.03	0.62	0.3
11/3/2016	12.92	ND	0	0					5.79	35.11	0.54	0.3
11/30/2016	13.16	ND	0	0					6.03	35.23	0.42	0.3
1/4/2017	13.24	ND	0	0					6.17	35.09	0.56	0.5
2/7/2017	13.29	ND	0	0					6.26	35.01	0.64	0.5
3/2/2017	13.17	ND	0	0					6.16	35.09	0.56	0.5
4/3/2017	13.04	ND	0	0					6.09	35.13	0.52	0.5
4/27/2017	13.14	ND	0	0					6.12	35.2	0.45	0.5
5/29/2017	13.41	ND	0	0					6.29	35.06	0.59	0.5
7/5/2017	13.57	ND	0	0					6.39	35.14	0.51	0.3
8/1/2017	13.69	ND	0	0					6.47	35.21	0.44	0.3
9/5/2017	13.79	ND	0	0					6.56	35.34	0.31	0.3
10/4/2017	13.71	ND	0	0					6.63	35.39	0.26	0.3
11/2/2017	13.91	ND	0	0					6.74	35.31	0.34	0.3
11/29/2017	14.02	ND	0	0					6.79	35.29	0.36	0.3
1/2/2018	13.06	ND	0	0					6.34	35.34	0.31	0.3
2/7/2018	12.42	ND	0	0					6.42	35.31	0.34	0.3
3/1/2018	12.58	ND	0	0					6.67	35.21	0.44	0.5
4/2/2018	12.46	ND	0	0					6.61	35.16	0.49	0.5
5/1/2018	13.04	ND	0	0					7.22	35.23	0.42	1.3

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-57B				MW-68B				MW-70B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/1/2018	13.29	ND	0	0					7.42	35.29	0.36	1
6/29/2018	13.47	ND	0	0					7.58	35.21	0.44	1
8/3/2018	13.61	ND	0	0					7.69	35.29	0.36	0.8
8/31/2018	13.47	ND	0	0					7.42	35.36	0.29	0.5
9/28/2018	13.36	ND	0	0					7.33	35.28	0.37	0.5
11/2/2018	13.21	ND	0	0					7.22	35.24	0.41	0.8
11/29/2018	13.01	ND	0	0					7.06	35.21	0.44	0.5
1/2/2019	13.03	ND	Trace	0					6.96	35.31	0.34	0.5
2/2/2019	12.91	ND	Trace	0					6.87	35.36	0.29	0.5
2/28/2019	12.83	ND	Trace	0					6.74	35.29	0.36	0.5
4/2/2019	12.76	ND	Trace	0					6.67	35.27	0.38	0.5
4/25/2019	12.71	ND	Trace	0					6.74	35.21	0.44	0.5
5/29/2019	12.70	ND	Trace	0					6.71	35.17	0.48	0.5
6/12/2019	12.93	ND	0	0					6.43	34.84	0.81	1
6/30/2019	12.86	ND	0	0					6.48	34.61	1.04	1
7/16/2019	12.79	ND	0	0					6.43	34.49	1.16	1.5
8/2/2019	12.84	ND	0	0					6.48	34.31	1.34	1.5
8/15/2019	12.92	ND	0	0					6.51	34.07	1.58	2
8/28/2019	12.96	ND	0	0					6.57	34.09	1.56	2
9/17/2019	12.86	ND	0	0					6.51	34.01	1.64	2
10/2/2019	12.83	ND	0	0					6.46	33.71	1.94	2.5
10/16/2019	13.67	ND	0	0					6.42	ND	0	0
10/31/2019	14.21	ND	0	0					6.43	ND	Trace	0
11/15/2019	6.21	ND	0	0					4.75	ND	0	0
12/3/2019	13.51	ND	0	0					5.01	ND	0	0
12/18/2019	13.51	ND	0	0					5.53	35	0.65	0.3
12/30/2019	13.51	ND	0	0					5.71	32.4	3.25	0.1
1/7/2020	--	--	--	--	4.82	34.21	3.59	--	--	--	--	--
1/15/2020	21.93	ND	0	0	4.82	34.41	3.39	0.5	7.19	32.51	3.14	0.1
1/27/2020	19.96	ND	0	0	2.15	35.9	1.9	0.5	9.9	31.3	4.35	0.1
2/13/2020	17.91	ND	0	0	3.49	35.02	2.78	0.5	5.99	31.43	4.22	0.1
2/25/2020	16.86	ND	0	0	2.35	36.12	1.68	0.3	4.71	31.81	3.84	0.3
3/13/2020	15.91	ND	0	0	3.99	35.6	2.2	0.1	4.63	30.5	5.15	0.3
3/31/2020	15.37	ND	0	0	4.46	36.9	0.9	0.0	6.04	31.34	4.31	0.5
4/9/2020	15.19	ND	0	0	4.41	35.99	1.81	0.1	6.79	31.53	4.12	0.5
4/27/2020	14.99	ND	0	0	5.53	36.1	1.7	0.1	6.81	30.84	4.81	1.0
5/14/2020	14.95	ND	0	0	6.39	37.01	0.79	0	7.26	30.63	5.02	1.0
5/28/2020	14.92	ND	0	0	5.99	37.09	0.71	Trace	7.02	30.74	4.91	1.5
6/11/2020	14.89	ND	0	0	6.49	36.8	1	Trace	7.53	31.2	4.45	0.5
6/25/2020	14.28	ND	0	0	6.09	36.94	0.86	Trace	7.08	32.12	3.53	0.5
7/9/2020	14.67	ND	0	0	5.06	37.37	0.43	0.3	5.61	32	3.65	0.5
7/23/2020	17.09	ND	0	0	5.31	37.47	0.33	Trace	6.33	32.2	3.45	1.0
8/6/2020	16.20	ND	0	0	3.02	37.38	0.42	Trace	6.15	33.12	2.53	1.3
8/20/2020	15.47	ND	0	0	5.11	37.26	0.54	Trace	5.74	33.2	2.45	1.0
9/2/2020	15.01	ND	0	0	5.96	37.4	0.4	Trace	6.74	34.39	1.26	0.1
9/17/2020	14.71	ND	0	0	6.6	37.32	0.48	0.1	6.92	34.99	0.66	0.1
10/1/2020	14.44	ND	0	0	3.81	37.39	0.41	0.1	5.52	34.88	0.77	0.3
10/14/2020	14.08	ND	0	0	5.11	36.81	0.99	0.3	5.63	34.49	1.16	0.3
10/28/2020	13.87	ND	0	0	5.26	36.52	1.28	0.3	4.8	34.71	0.94	0.3
11/12/2020	13.81	ND	0	0	6.13	36.82	0.98	0.3	6.38	34.21	1.44	0.5
11/23/2020	13.21	ND	0	0	6.54	37.2	0.6	0.3	7.51	35.19	0.46	0.3
12/10/2020	13.76	ND	0	0	3.24	37.08	0.72	0.0	5.82	35.10	0.55	0.1
12/21/2020	13.56	ND	0	0	1.22	37.01	0.79	0.1	5.55	34.48	1.17	0.1
1/7/2021	13.25	ND	0	0	2.48	ND	0	0	5.04	35	0.65	Trace
1/21/2021	20.69	ND	0	0	2.99	37.37	0.43	Trace	4.72	35.02	0.63	Trace
2/4/2021	18.46	ND	0	0	3.62	37.32	0.48	Trace	7.2	35.08	0.57	Trace
2/23/2021	16.49	ND	0	0	2.51	ND	0	0	5.33	34.2	1.45	1.0
3/11/2021	15.55	ND	0	0	3.49	ND	0	0	5.33	34.3	1.35	0.8
3/25/2021	15.06	ND	0	0	3.34	ND	0	0	5.78	34.93	0.72	0.5
4/8/2021	14.84	ND	0	0	4.28	ND	0	0	5.88	34.83	0.82	0.5
4/22/2021	14.65	ND	0	0	4.96	ND	0	0	5.99	34.56	1.09	0.5
5/4/2021	14.59	ND	0	0	3.64	37.38	0.42	0	6.21	34.39	1.26	0.5
5/20/2021	14.61	ND	0	0	0.99	ND	0	0	5.89	35.09	0.56	0.3

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-57B				MW-68B				MW-70B			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
6/3/2021	14.12	ND	0	0	2.66	ND	0	0	4.58	34.98	0.67	0.3
6/17/2021	13.84	ND	0	0	3.51	ND	0	0	4.78	35.16	0.49	0.3
7/1/2021	13.61	ND	0	0	1.11	37.01	0.39	0.1	4.48	34.85	0.8	Trace
7/19/2021	13.22	ND	0	0	1.06	37.21	0.19	Trace	3.78	34.9	0.75	Trace
7/29/2021	16.66	ND	0	0	3.74	37.38	0.02	Trace	5.74	35.2	0.45	Trace
8/12/2021	15.32	ND	0	0	5.21	ND	0	0	5.71	35.12	0.53	Trace
8/26/2021	14.92	ND	0	0	5.80	ND	0	Trace	5.88	35.16	0.49	Trace
9/10/2021	14.61	ND	0	0	5.08	ND	0	0	6.41	35.18	0.47	0.1
9/22/2021	14.40	ND	0	0	4.65	ND	0	0	6.46	ND	0	0
10/8/2021	14.10	ND	0	0	3.14	ND	0	0	5.12	ND	0	0
10/20/2021	14.61	ND	0	0	5.01	ND	0	0	6.84	35.27	0.38	0
11/4/2021	13.59	ND	0	0	3.38	ND	0	0	5.10	ND	0	0
11/18/2021	13.44	ND	0	0	4.38	ND	0	0	5.34	ND	0	0
12/3/2021	13.40	ND	0	0	4.38	ND	0	0	5.58	ND	0	0
12/16/2021	13.36	ND	0	0	4.72	ND	0	0	5.84	ND	0	0
12/30/2021	13.41	ND	Trace	0	3.88	ND	0	0	5.46	ND	Trace	0
1/14/2022	13.52	ND	Trace	0	3.92	ND	0	0	5.56	ND	Trace	0
1/26/2022	13.44	ND	Trace	0	4.06	ND	0	0	5.67	ND	Trace	0
2/10/2022	19.21	ND	0	0	3.07	ND	0	0	5.39	ND	0	0
2/24/2022	17.65	ND	0	0	4.08	ND	0	0	5.52	34.7	0.6	0.2
3/10/2022	18.44	ND	0	0	4.99	ND	0	0	6.23	ND	0	0
3/24/2022	16.06	ND	0	0	2.91	ND	0	0	6.24	ND	0	0
4/7/2022	15.60	ND	0	0	4.23	ND	0	0	6.05	ND	0	0
4/18/2022	15.39	ND	0	0	4.46	ND	0	0	6.29	ND	0	0
5/2/2022	15.17	ND	0	0	5.13	ND	0	0	6.40	ND	Trace	0
5/20/2022	15.41	ND	0	0	5.21	ND	0	0	6.52	ND	0	0
6/2/2022	15.34	ND	0	0	5.39	ND	0	0	6.43	ND	0	0
6/16/2022	14.95	ND	Trace	0	5.27	ND	0	0	8.80	ND	0	0
6/30/2022	15.03	ND	Trace	0	5.35	ND	0	0	8.96	ND	0	0
7/15/2022	15.22	ND	Trace	0	6.79	ND	0	0	7.34	ND	0	0
7/28/2022	15.38	ND	Trace	0	6.91	ND	0	0	7.41	ND	0	0
8/12/2022	16.60	ND	Trace	0	6.54	ND	Trace	0	7.90	ND	0	0
8/29/2022	15.61	ND	0	0	4.35	ND	0	0	6.26	ND	0	0
9/16/2022	15.30	ND	0	0	6.00	37.20	0.75	0.25	7.30	31.90	3.40	0.25
9/30/2022	15.00	ND	Trace	0	7.00	ND	Trace	0	7.40	32.00	3.30	0.25
10/17/2022	14.85	ND	Trace	0	7.83	ND	Trace	0	7.90	32.85	2.45	0.10
10/27/2022	14.93	ND	Trace	0	7.97	ND	Trace	0	8.27	32.97	2.33	0.50
11/10/2022	14.77	ND	Trace	0	7.72	ND	Trace	0	8.13	32.82	2.48	0.50
11/30/2022	11.23	ND	Trace	0	3.22	ND	Trace	0	3.29	33.63	1.67	0.50
12/16/2022	11.06	ND	Trace	0	3.34	ND	Trace	0	3.16	33.69	1.61	0.50
12/27/2022	11.49	ND	Trace	0	2.96	ND	Trace	0	2.87	33.52	1.78	0.50
1/13/2023	12.46	ND	Trace	0	2.09	ND	Trace	0	2.61	33.62	1.68	0.50
1/27/2023	18.73	42.11	0.71	0	2.21	ND	Trace	0	5.29	34.48	0.82	0.50
2/9/2023	17.23	ND	Trace	0	3.00	ND	Trace	0	5.74	ND	Trace	0
2/23/2023	16.19	ND	0	0	3.96	ND	0	0	5.78	34.60	0.70	0.25
3/9/2023	16.06	ND	0	0	3.74	ND	0	0	5.56	34.29	1.01	0.50
3/23/2023	15.23	ND	Trace	0	4.56	ND	Trace	0	6.28	ND	Trace	0
4/6/2023	16.13	ND	Trace	0	3.96	ND	Trace	0	5.69	34.62	0.68	0.50
4/19/2023	14.87	ND	0	0	4.19	ND	Trace	0	5.99	ND	Trace	0
5/5/2023	15.96	ND	0	0	3.72	ND	Trace	0	5.79	34.69	0.61	0
5/18/2023	14.23	ND	0	0	1.6	ND	0	0	4.4	32.92	2.38	0.05
6/1/2023	13.86	ND	Trace	0	4.38	ND	Trace	0	5.64	ND	Trace	0
6/15/2023	13.75	ND	Trace	0	4.8	ND	0	0	5.63	32.85	2.45	1.1
6/29/2023	13.74	ND	Trace	0	5.84	ND	Trace	0	6.57	ND	Trace	0.1
Total DNAPL Pumped (gal)				***2.8***				***4.1***				***62.8***

* - indicates DNAPL and groundwater mixture
--- - No DNAPL pumped
DTW - Depth to water (feet Below Top of Casing (BTOC))
DTD - Depth to DNAPL (feet BTOC)
ND - Not detected
NM - Not measured
PoP - Product on probe, not measureable

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-74B				MW-75B				MW-78A				
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	Approx DNAPL Recovered (gal)
2/14/2013					10.01	34.1	3.1	0.3	NM	NM	NM	0	9.5
4/3/2013					13.71	36.47	0.73	0.3	NM	NM	NM	0	4.9
4/22/2013					9.72	36.72	0.48	0.3	NM	NM	NM	0	2.6
5/30/2013					9.61	35.09	2.11	*0.8*	NM	NM	NM	0	7.4
6/29/2013					10.61	35.61	1.59	*0.8*	NM	NM	NM	0	6.9
7/22/2013					9.74	35.71	1.49	*0.8*	NM	NM	NM	0	6.4
8/26/2013					10.76	35.93	1.27	0.8	NM	NM	NM	0	6.3
9/27/2013					10.52	36.39	0.81	0.5	NM	NM	NM	0	5.5
10/31/2013					10.31	36.47	0.73	1	NM	NM	NM	0	4.9
11/27/2013					10.39	36.51	0.69	1	NM	NM	NM	0	4.7
12/31/2013					10.13	36.72	0.48	1	NM	NM	NM	0	4.6
1/30/2014					12.62	36.49	0.71	0.8	NM	NM	NM	0	4.6
3/3/2014					12.12	36.35	0.85	0.8	NM	NM	NM	0	4.7
3/31/2014					12.01	36.27	0.93	0.8	NM	NM	NM	0	4.9
4/30/2014					11.84	36.02	1.18	0.8	NM	NM	NM	0	4.9
5/27/2014					11.71	35.79	1.41	0.8	NM	NM	NM	0	4.6
6/26/2014					11.58	35.91	1.29	0.5	NM	NM	NM	0	4.8
7/31/2014					11.32	35.82	1.38	0.5	NM	NM	NM	0	4.5
8/27/2014					11.19	36.09	1.11	0.5	NM	NM	NM	0	4.0
10/3/2014					11.09	36.01	1.19	0.5	NM	NM	NM	0	4.5
11/3/2014					11.16	36.19	1.01	0.8	9.31	19.12	6.23	2	7.0
11/24/2014					11.21	36.27	0.93	0.5	9.39	19.62	5.73	2	7.5
12/22/2014					11.26	36.19	1.01	0.5	9.34	19.86	5.49	2	7.8
1/29/2015					11.06	36.34	0.86	0.5	9.14	21.29	4.06	2	7.3
2/26/2015					11.09	36.34	0.86	0.5	9.17	19.97	5.38	2.5	9.5
3/26/2015					10.93	36.42	0.78	0.5	9.12	20.31	5.04	0.8	7.0
4/27/2015					10.78	36.52	0.68	0.5	9.17	20.46	4.89	2	9.5
5/26/2015					10.61	36.72	0.48	0.8	9.09	20.59	4.76	2.5	11.3
7/6/2015					8.52	36.91	0.29	0.8	7.01	21.16	4.19	2	9.8
8/3/2015					8.66	36.96	0.24	0.8	7.12	21.39	3.96	2.5	10.0
8/27/2015					9.31	36.91	0.29	0.8	7.96	21.51	3.84	2	7.8
10/5/2015					8.62	37.02	0.18	0.5	7.23	21.67	3.68	2	7.5
11/5/2015					8.34	36.93	0.27	0.5	7.02	21.56	3.79	2	7.5
12/3/2015					8.12	36.81	0.39	0.5	6.83	21.67	3.68	2	7.5
12/28/2015					8.01	36.72	0.48	0.5	6.71	21.52	3.83	2.3	8.5
2/3/2016					7.82	36.19	1.01	0.3	6.52	21.67	3.68	2	8.8
3/3/2016					7.74	36.27	0.93	0.5	6.46	21.72	3.63	2	9.0
3/31/2016					7.67	36.39	0.81	0.5	6.49	21.86	3.49	2	9.0
5/3/2016					7.79	36.47	0.68	0.5	6.57	21.94	3.41	2	7.5
6/2/2016					7.71	36.42	0.73	0.5	6.65	21.91	3.44	2	8.0
7/8/2016					7.8	36.53	0.62	0.5	6.71	21.97	3.38	2	7.8
8/3/2016					7.89	36.59	0.56	0.5	6.82	22.04	3.31	2	7.8
8/30/2016					7.96	36.64	0.51	0.5	6.94	22.21	3.14	2	8.0
9/30/2016					7.91	36.51	0.64	0.5	7.04	22.39	2.96	2	8.3
11/3/2016					7.86	36.36	0.79	0.5	7.11	22.49	2.86	2	8.3
11/30/2016					7.97	36.47	0.68	0.8	7.29	22.67	2.68	2	8.5
1/4/2017					8.04	36.36	0.79	0.8	7.42	22.74	2.61	2	8.5
2/7/2017					8.12	36.21	0.94	0.8	7.48	22.93	2.42	2.5	8.8
3/2/2017					8.01	36.26	0.89	0.8	7.36	23.26	2.09	2	8.3
4/3/2017					7.93	36.43	0.72	0.8	7.29	23.34	2.01	2	7.3
4/27/2017					7.86	36.52	0.63	0.8	7.36	23.42	1.93	2	7.5
5/29/2017					7.94	36.41	0.74	0.8	7.51	23.51	1.84	2	7.5
7/5/2017					8.04	36.36	0.79	0.8	7.79	23.59	1.76	2	6.8
8/1/2017					8.16	36.31	0.84	0.8	7.89	23.51	1.84	2	7.5
9/5/2017					8.22	36.47	0.68	0.8	7.81	23.48	1.87	2	7.8
10/4/2017					8.29	36.56	0.59	0.8	7.89	23.51	1.84	2	7.3
11/2/2017					8.37	36.51	0.64	1	7.97	23.59	1.76	2	8.0
11/29/2017					8.33	36.59	0.56	1	8.02	23.67	1.68	2	7.5
1/2/2018					8.07	36.72	0.43	1	8.17	23.82	1.53	2	7.8
2/7/2018					8.17	36.91	0.24	1	8.29	23.97	1.38	2	7.8
3/1/2018					8.31	36.94	0.21	1	8.47	23.91	1.44	2	7.0
4/2/2018					8.26	36.89	0.26	0.8	8.39	23.97	1.38	2.3	7.3
5/1/2018					8.92	36.96	0.19	0.8	9.02	24.06	1.29	2	8.0

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-74B				MW-75B				MW-78A				
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	Approx DNAPL Recovered (gal)
6/1/2018					9.34	36.91	0.24	0.8	9.21	24.13	1.22	2	8.8
6/29/2018					9.67	36.82	0.33	0.8	9.39	24.21	1.14	2.3	9.5
8/3/2018					9.84	36.87	0.28	0.8	9.47	24.31	1.04	2	9.0
8/31/2018					9.71	36.91	0.24	0.8	9.32	24.47	0.88	2	7.8
9/28/2018					9.62	36.84	0.31	0.8	9.22	24.39	0.96	2	7.8
11/2/2018					9.57	36.88	0.27	0.8	9.09	24.27	1.08	2	7.8
11/29/2018					9.41	36.92	0.23	1	8.96	24.22	1.13	2	7.0
1/2/2019					9.28	36.96	0.19	1	8.78	24.39	0.96	2	7.3
2/2/2019					9.22	36.91	0.24	1	8.71	24.47	0.88	2	7.5
2/28/2019					9.16	36.93	0.22	1	8.67	24.42	0.93	2	8.3
4/2/2019					9.06	36.91	0.24	1	8.58	24.43	0.92	2	8.3
4/25/2019					9.02	36.72	0.43	1	8.49	24.31	1.04	2	8.8
5/29/2019					9.07	36.67	0.48	1	8.42	24.26	1.09	2	8.8
6/12/2019					8.92	ND	Trace	0	8.67	23.96	1.39	2	9.0
6/30/2019					8.66	ND	Trace	0	9.36	23.77	1.58	2	9.8
7/16/2019					8.62	ND	Trace	0	9.29	23.62	1.73	2	10.5
8/2/2019					8.67	ND	Trace	0	9.34	23.57	1.78	2	8.0
8/15/2019					8.69	ND	0	0	9.42	23.06	2.29	2	12.0
8/28/2019					8.72	ND	Trace	0	9.51	23.01	2.34	2	12.0
9/17/2019					8.61	ND	Trace	0	9.39	22.76	2.59	2	13.0
10/2/2019					8.53	ND	Trace	0	9.27	22.58	2.77	2	10.5
10/16/2019					NM	NM	NM	0	10.16	21.63	3.72	2	8.0
10/31/2019					NM	NM	NM	0	10.41	21.79	3.56	2.5	8.5
11/15/2019					7.91	ND	0	0	8.01	21.62	3.73	1.5	5.0
12/3/2019					8.24	ND	0	0	8.41	22.12	3.23	2	6.5
12/18/2019					4.99	ND	0	0	8.38	ND	0	0	2.1
12/30/2019					7.79	35.3	1.85	0	9.16	19.93	5.42	1.5	3.3
1/7/2020					--	--	--	--	--	--	--	--	--
1/15/2020					6.47	36.4	0.75	0	8.79	24.9	0.45	0.1	4.1
1/27/2020					5.92	34.6	2.55	0.1	7.06	24.06	1.29	0	3.8
2/13/2020					7.88	35.08	2.07	0.1	8.01	24.08	1.27	0	3.3
2/25/2020					5.82	ND	0	0	7.84	21.86	3.49	0.3	2.6
3/13/2020					8.24	34.9	2.25	0.1	NM	NM	NM	0	2.3
3/31/2020					4.79	ND	0	0	7.82	23.1	2.25	0.1	5.9
4/9/2020					8.52	ND	0	0	7.52	22.5	2.85	0.1	7.3
4/27/2020					9.07	ND	0	0	8.33	23.2	2.15	0.5	7.7
5/14/2020					7.74	37.1	0.05	0	8.05	23.22	2.13	0.5	8.3
5/28/2020					5.06	ND	0	0	7.59	23.69	1.66	0.5	8.6
6/11/2020					5.79	37	0.15	Trace	7.39	24.96	0.39	0.1	5.6
6/25/2020					4.87	ND	0	0	6.28	19.9	5.45	1.5	6.5
7/9/2020					8.91	ND	0	0	8.41	19.7	5.65	2.5	7.3
7/23/2020					8.71	ND	0	0	7.85	20.91	4.44	1.0	8.8
8/6/2020					6.74	ND	0	0	7.81	22.05	3.3	1.0	6.3
8/20/2020					6.01	ND	0	0	7.21	21.88	3.47	0.5	3.9
9/2/2020					8.61	ND	0	0	6.98	22.6	2.75	1.0	4.4
9/17/2020					8.52	ND	0	0	8.05	22.21	3.14	0.5	3.1
10/1/2020					7.33	37.1	Trace	0	8.01	24.1	1.25	1.0	3.9
10/14/2020					8.26	37.2	Trace	Trace	8.11	24.9	0.45	0.5	8.3
10/28/2020					8.11	ND	0	0	7.99	25.08	0.27	0.3	6.3
11/12/2020					8.41	36.78	0.37	0.3	8.42	25.0	0.35	0.1	5.6
11/23/2020					8.62	36.04	1.11	0.3	9.19	25.08	0.27	0.3	3.3
12/10/2020					7.94	36.54	0.61	0.1	8.79	25.12	0.23	Trace	4.8
12/21/2020					6.15	36.84	0.31	0.1	6.43	25.21	0.14	Trace	3.9
1/7/2021					6.81	37.01	0.14	0.1	7.31	ND	0	0	4.1
1/21/2021					7.85	35.5	1.65	2.0	7.71	ND	0	0	7.8
2/4/2021					8.19	35.2	1.95	2.0	7.63	ND	0	0	7.8
2/23/2021					7.64	34.59	2.56	1.0	7.52	ND	0	0	6.5
3/11/2021					7.82	35.1	2.05	1.0	7.42	ND	0	0	6.5
3/25/2021					7.91	36.81	0.34	0.3	7.28	ND	0	0	5.3
4/8/2021					7.08	36.53	0.62	0	7.41	ND	0	0	5.0
4/22/2021					8.59	36.8	0.35	0.3	7.02	ND	0	0	4.4
5/4/2021	7.81	32.80	2.20	2.0	7.83	ND	0	0	7.22	ND	0	0	6.8
5/20/2021	5.93	33.40	1.60	0.5	8.06	37.1	0.05	0.3	8.04	ND	0	0	5.5

TABLE 1

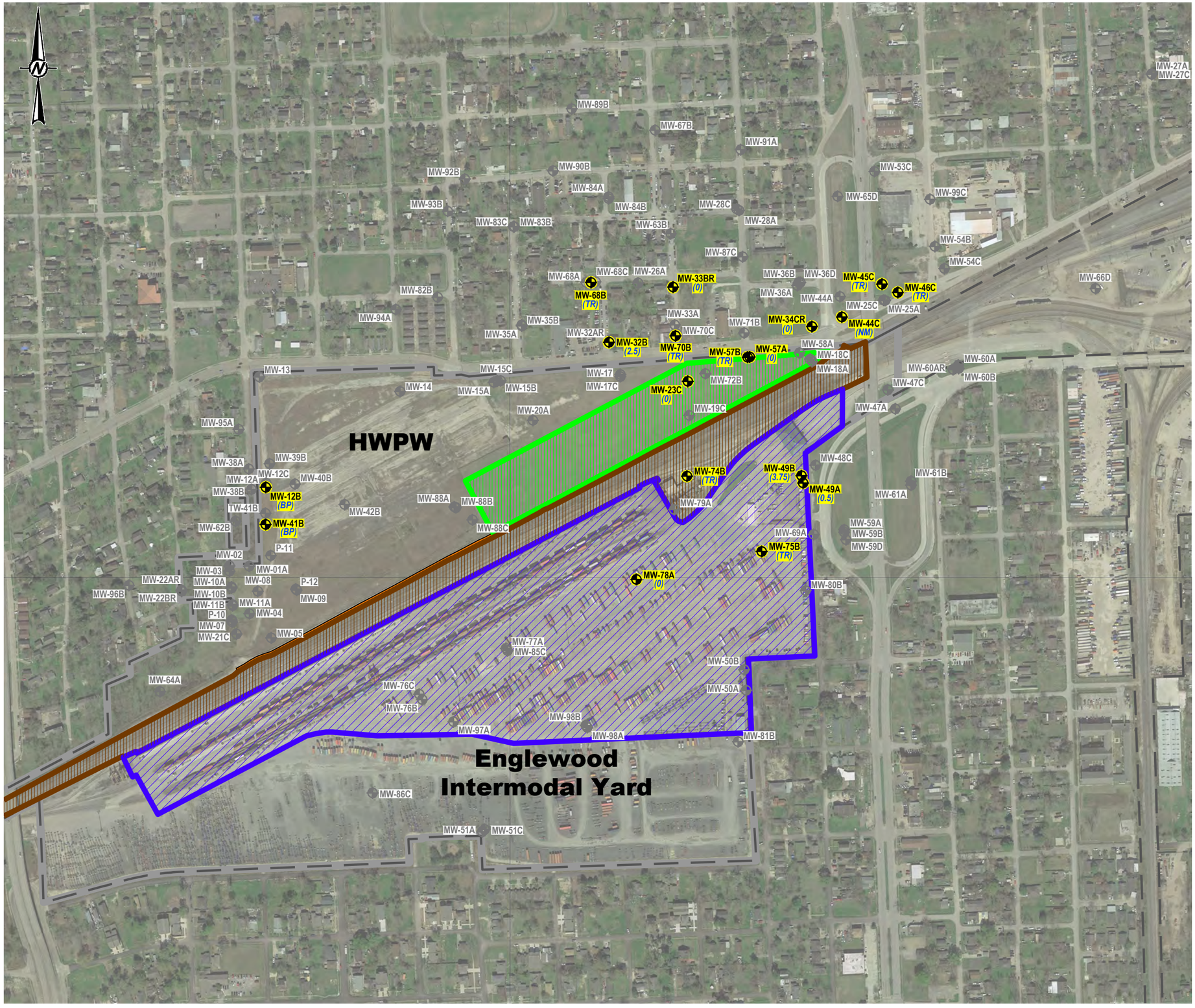
SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-74B				MW-75B				MW-78A				
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	Approx DNAPL Recovered (gal)
6/3/2021	6.54	33.62	1.38	0.5	3.71	37.02	0.13	0.1	7.49	ND	0	0	4.9
6/17/2021	6.86	34.70	0.30	0.1	5.21	ND	0	0	6.81	ND	0	0	3.9
7/1/2021	3.68	34.08	0.92	0.5	7.33	ND	0	0	NM	NM	NM	0	4.4
7/19/2021	5.36	34.15	0.85	0.8	5.16	ND	0	0	NM	NM	NM	0	4.0
7/29/2021	6.31	33.60	1.40	1.0	7.48	ND	0	0	7.18	ND	0	0	3.9
8/12/2021	7.51	33.34	1.66	1.0	7.58	ND	0	0	6.84	ND	0	0	4.4
8/26/2021	7.34	33.22	1.78	1.0	8.19	37.01	0.14	Trace	6.92	ND	0	0	5.0
9/10/2021	7.81	34.40	0.60	0.2	8.63	ND	0	0	6.58	ND	0	0	2.6
9/22/2021	11.35	34.41	0.59	0	8.09	ND	0	0	NM	NM	NM	0	1.3
10/8/2021	6.94	33.58	1.42	0	8.03	ND	0	0	7.14	ND	0	0	1.0
10/20/2021	11.84	34.81	0.19	0	8.21	ND	0	0	NM	NM	NM	0	1.3
11/4/2021	7.24	33.83	1.17	0.3	7.70	ND	0	0	7.01	ND	0	0	2.0
11/18/2021	7.41	ND	0	0	7.70	ND	0	0	7.11	ND	0	0	0.3
12/3/2021	7.90	ND	0	0	7.94	ND	0	0	7.46	ND	0	0	1.3
12/16/2021	7.51	ND	0	0	8.12	ND	0	0	7.80	ND	0	0	1.3
12/30/2021	7.76	ND	Trace	0	NM	NM	NM	0	8.09	ND	Trace	0	1.5
1/14/2022	7.82	ND	Trace	0	NM	NM	NM	0	8.16	ND	Trace	0	1.5
1/26/2022	7.91	ND	Trace	0	NM	NM	NM	0	8.27	ND	Trace	0	1.5
2/10/2022	7.30	ND	0	0	NM	NM	NM	0	8.88	ND	0	0	0.9
2/24/2022	8.41	ND	0	0	NM	NM	NM	0	8.51	ND	0	0	1.1
3/10/2022	8.60	ND	0	0	NM	NM	NM	0	8.67	ND	0	0	1.2
3/24/2022	8.62	ND	0	0	NM	NM	NM	0	8.65	ND	0	0	0.3
4/7/2022	8.20	ND	0	0	NM	NM	NM	0	8.90	ND	0	0	0.5
4/18/2022	8.42	ND	0	0	NM	NM	NM	0	8.96	ND	0	0	2.3
5/2/2022	8.52	ND	0	0	NM	NM	NM	0	9.02	ND	0	0	2.5
5/20/2022	8.51	ND	0	0	NM	NM	NM	0	9.13	ND	0	0	2.5
6/2/2022	8.39	ND	0	0	NM	NM	NM	0	9.26	ND	0	0	2.5
6/16/2022	9.09	ND	Trace	0	NM	NM	NM	0	9.13	ND	Trace	0	1.8
6/30/2022	9.47	ND	Trace	0	NM	NM	NM	0	9.23	ND	Trace	0	1.4
7/15/2022	8.41	ND	Trace	0	NM	NM	NM	0	9.26	ND	Trace	0	2.5
7/28/2022	8.51	ND	Trace	0	NM	NM	NM	0	9.36	ND	Trace	0	2.5
8/12/2022	8.82	ND	Trace	0	NM	NM	NM	0	9.59	ND	Trace	0	0.4
8/29/2022	8.62	ND	0	0	NM	NM	NM	0	9.41	ND	0	0	3.5
9/16/2022	8.80	ND	Trace	0	NM	NM	NM	0	NM	NM	NM	0	4.5
9/30/2022	8.70	ND	0	0	NM	NM	NM	0	9.20	ND	Trace	0	8.0
10/17/2022	9.24	ND	0	0	NM	NM	NM	0	9.21	ND	Trace	0	5.1
10/27/2022	9.42	ND	0	0	NM	NM	NM	0	9.34	ND	Trace	0	5.5
11/10/2022	9.31	ND	0	0	NM	NM	NM	0	9.17	ND	Trace	0	5.5
11/30/2022	6.02	ND	0	0	NM	NM	NM	0	5.81	ND	0	0	5.0
12/16/2022	6.12	ND	0	0	NM	NM	NM	0	5.72	ND	0	0	5.0
12/27/2022	6.02	ND	0	0	NM	NM	NM	0	6.17	ND	0	0	5.0
1/13/2023	6.67	ND	0	0	NM	NM	NM	0	6.79	ND	0	0	5.0
1/27/2023	7.64	ND	Trace	0	NM	NM	NM	0	8.6	ND	0	0	2.8
2/9/2023	7.21	ND	0	0	NM	NM	NM	0	8.65	ND	Trace	0	0.9
2/23/2023	7.84	ND	0	0	NM	NM	NM	0	8.61	ND	0	0	3.3
3/9/2023	7.67	ND	0	0	NM	NM	NM	0	8.51	ND	0	0	3.5
3/23/2023	8.12	ND	0	0	NM	NM	NM	0	8.47	ND	Trace	0	3.3
4/6/2023	7.81	ND	0	0	NM	NM	NM	0	8.59	ND	0	0	4.5
4/19/2023	7.90	ND	0	0	7.11	NM	NM	0	8.50	ND	0	0	4.0
5/5/2023	7.62	ND	0	0	8.01	NM	NM	0	8.42	ND	Trace	0	3.5
5/18/2023	6.10	ND	0	0	6.72	ND	0	0	7.82	ND	0	0	3.1
6/1/2023	6.85	ND	0	0	NM	NM	NM	0	7.50	ND	Trace	0	2.4
6/15/2023	6.86	ND	0	0	NM	NM	NM	0	7.54	ND	Trace	0	3.7
6/29/2023	7.24	ND	Trace	0	7.85	ND	Trace	0	7.57	ND	0	0	1.7
Total DNAPL Pumped (gal)				***7.8***				***60.9***				***151.3***	***1026.4***

* - indicates DNAPL and groundwater mixture
--- - No DNAPL pumped
DTW - Depth to water (feet Below Top of Casing (BTOC))
DTD - Depth to DNAPL (feet BTOC)
ND - Not detected
NM - Not measured
PoP - Product on probe, not measureable

MW-78A not measured 7/1/21, 7/19/21, 9/22/21, 10/20/21; well inaccessible due to container operations
MW-75B not measured 12/30/21; well inaccessible due to container operations

FIGURES



LEGEND

- UPRR PROPERTY BOUNDARY
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION USED FOR DNAPL RECOVERY
- (0.59) IN WELL DNAPL THICKNESS (FT)
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP AREA
- CONCRETE CAP AREA

NOTE(S)

1. BP - BELOW PUMP; DEPTH TO DNAPL NOT MEASURED BECAUSE DNAPL IS BELOW TOP OF IN-WELL PUMP.
2. IN-WELL THICKNESS MEASURED JUNE 29, 2023.
3. NM - NOT MEASURED; MW-44C DAMAGED.
4. TR - TRACE, NOT MEASURABLE.

REFERENCE(S)

PARCEL BOUNDARIES: CITY OF HOUSTON GEOGRAPHIC INFORMATION & MANAGEMENT SYSTEMS (GIMS).
AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.

DRAFT

0 200 400
1" = 400' FEET

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
IN-WELL DNAPL THICKNESS
JUNE 29, 2023

CONSULTANT
wsp

YYYY-MM-DD	2023-07-07
DESIGNED	AJD
PREPARED	AJD
REVIEWED	CE
APPROVED	ECM

PROJECT NO. 31406585.016 REV. 0 FIGURE 1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

0

Path: \\golder.gds\complexdata\office\Texarkana\Projects - Round Rock 20191\19119232 - HWPW\2023-07\ | File Name: 1 - In-Well DNAPL Thickness (June 2023).dwg | Last Edited By: adiamond Date: 2023-07-07 Time:10:18:05 AM | Printed By: adiamond Date: 2023-08-14 Time:3:26:56 PM

Figure 2
DNAPL Recovery Activities February 2013 - June 2023
UPRR Houston Wood Preserving Works

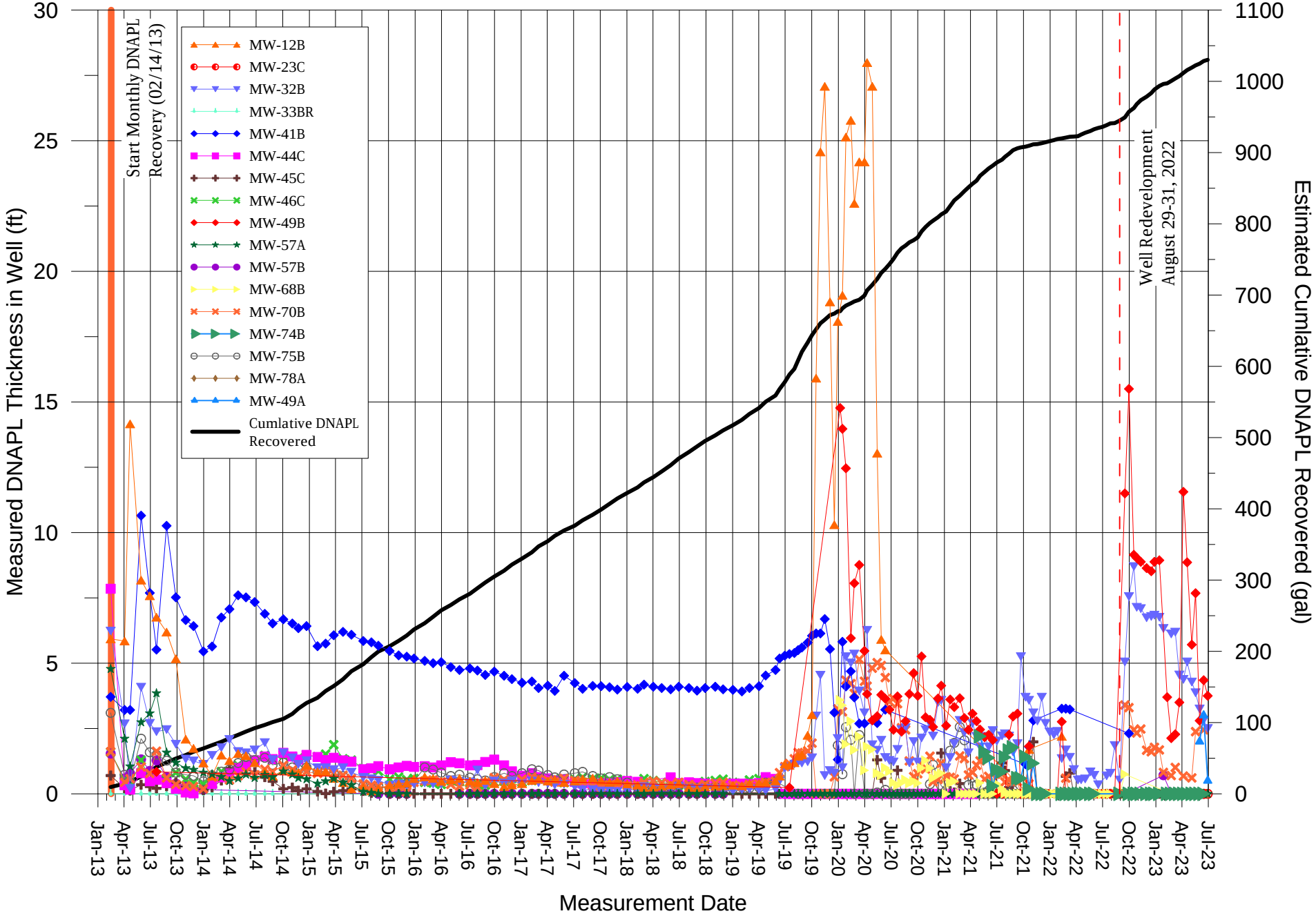
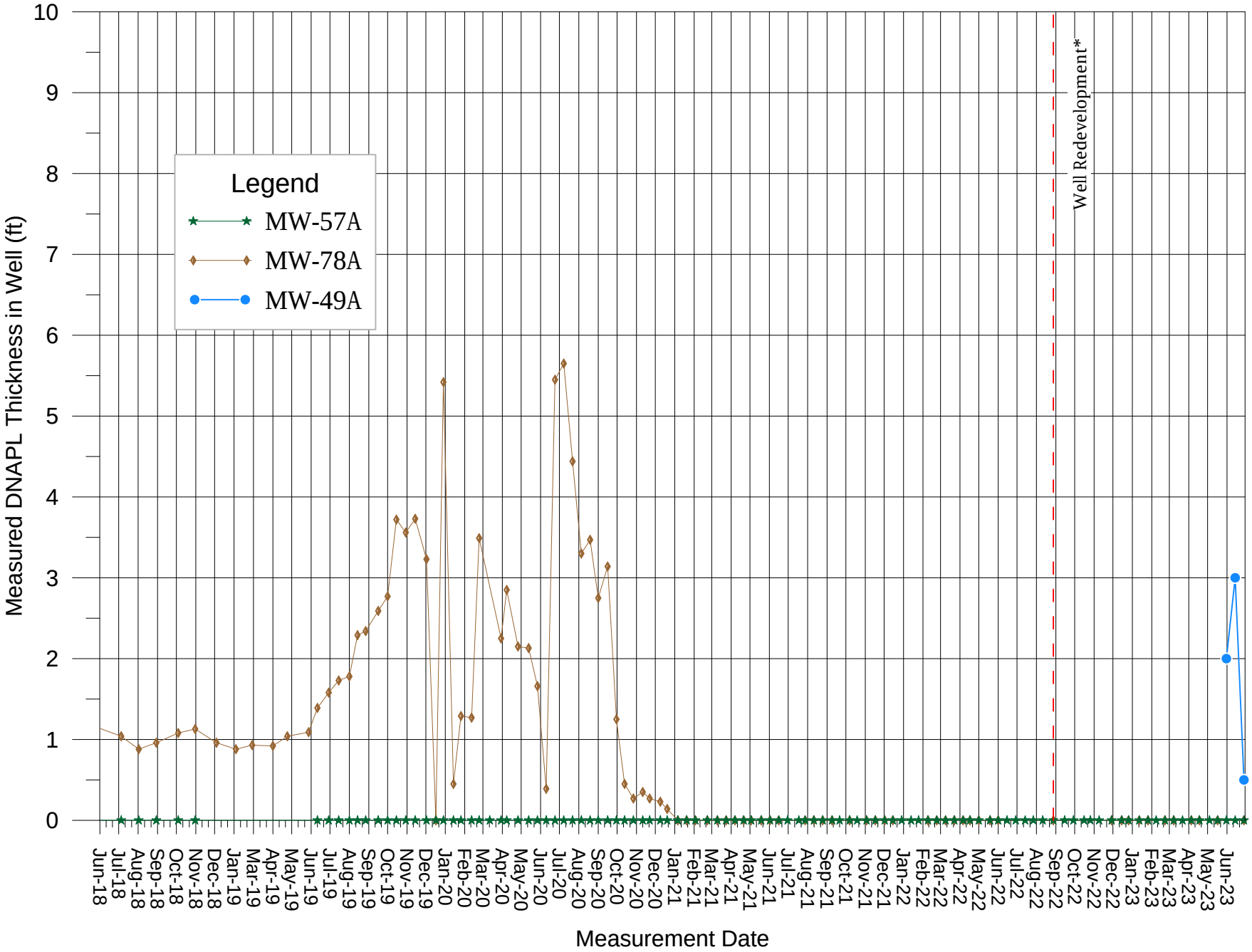
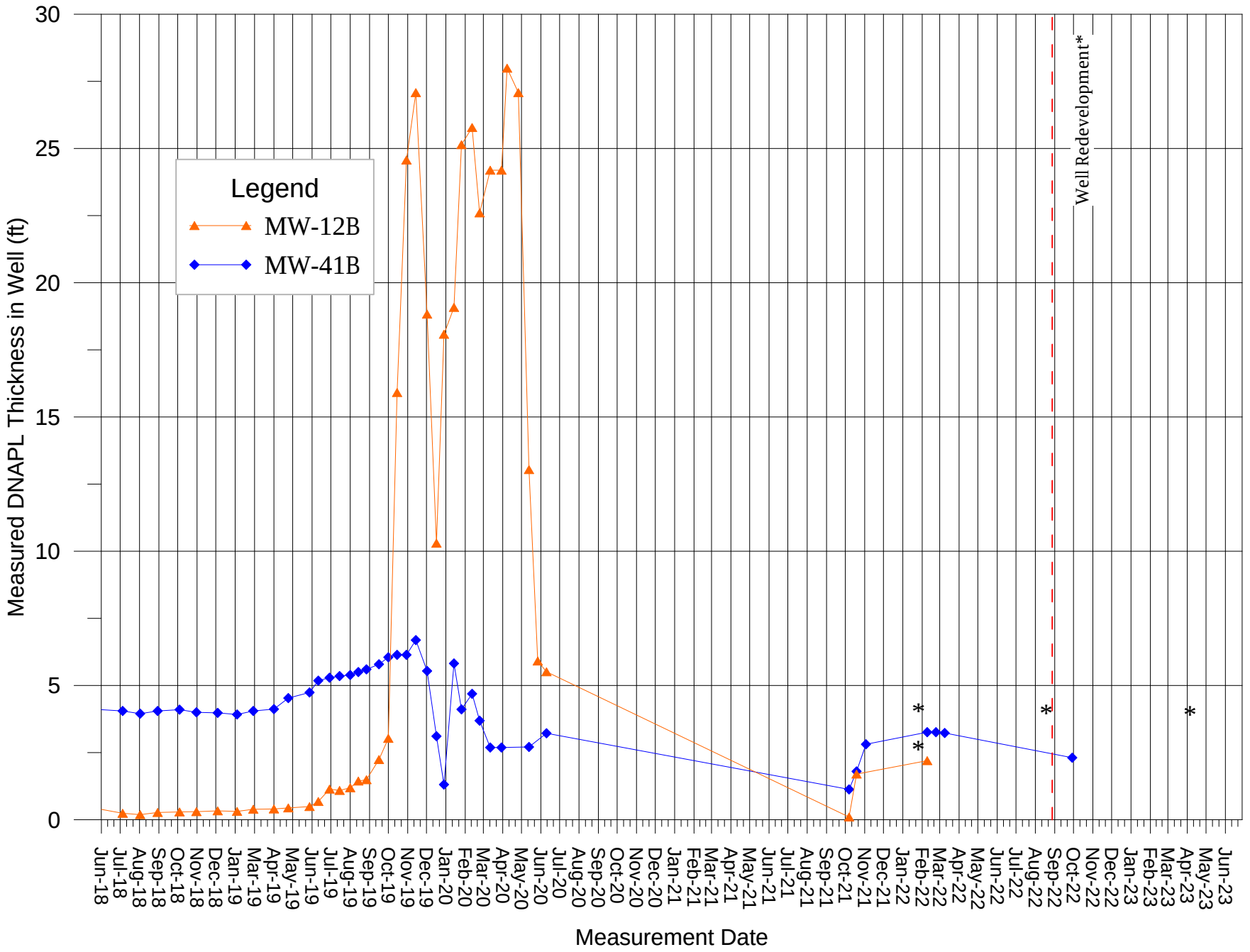


Figure 3
A-TZ Wells - DNAPL Recovery Activities July 2018 - June 2023
UPRR Houston Wood Preserving Works



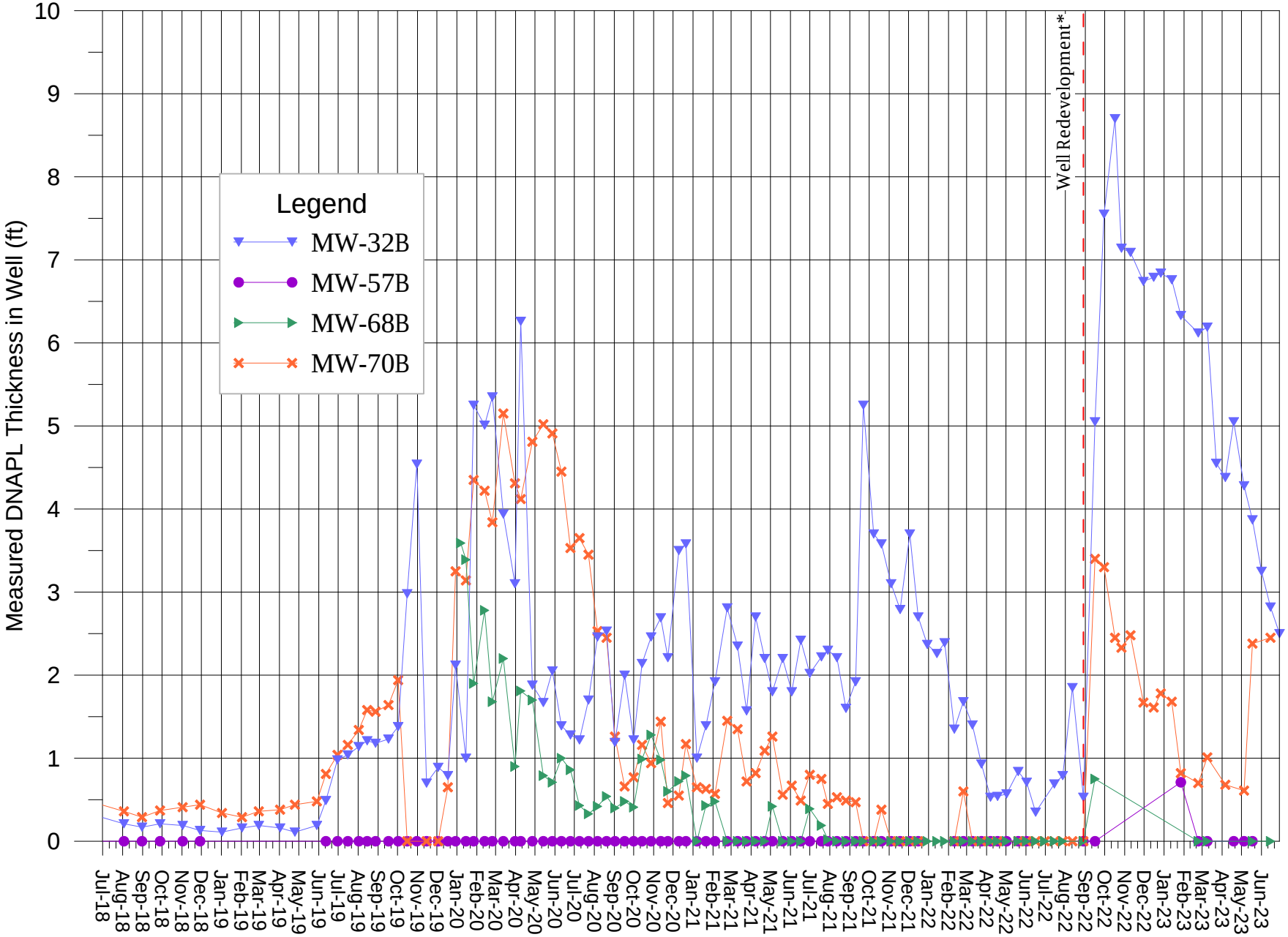
*Wells MW-57A and MW-78A redeveloped on August 29, 2022

Figure 4
B-TZ Wells (West Side) - In-Well DNAPL Thickness July 2018 - June 2023
UPRR Houston Wood Preserving Works



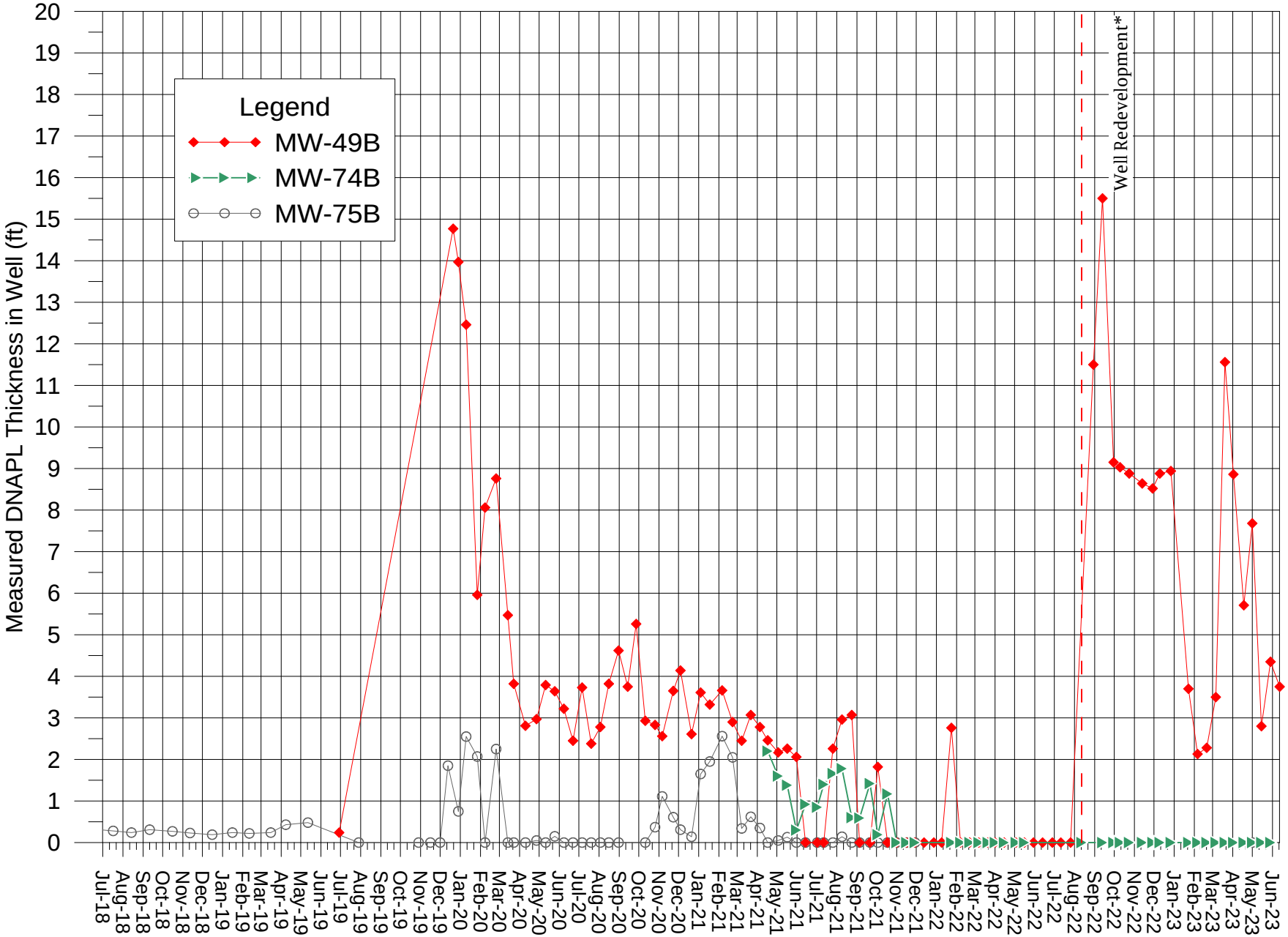
*DNAPL below top of in-well pumps from 3rd Q 20 to 3rd Q 21, Nov. and Dec. 21, April- Sept. 22, Oct. 22 through June 23 not measurable
Pumps removed on 10/08/2021 to measure pump length. Pumps are 1.55 ft in length.
Wells MW-12B and MW-41B redeveloped on 8/30/2022.

Figure 5
B-CZ/B-TZ Wells (North (On-Site and Off-Site)) - In-Well DNAPL Thickness July 2018 - June 2023
UPRR Houston Wood Preserving Works



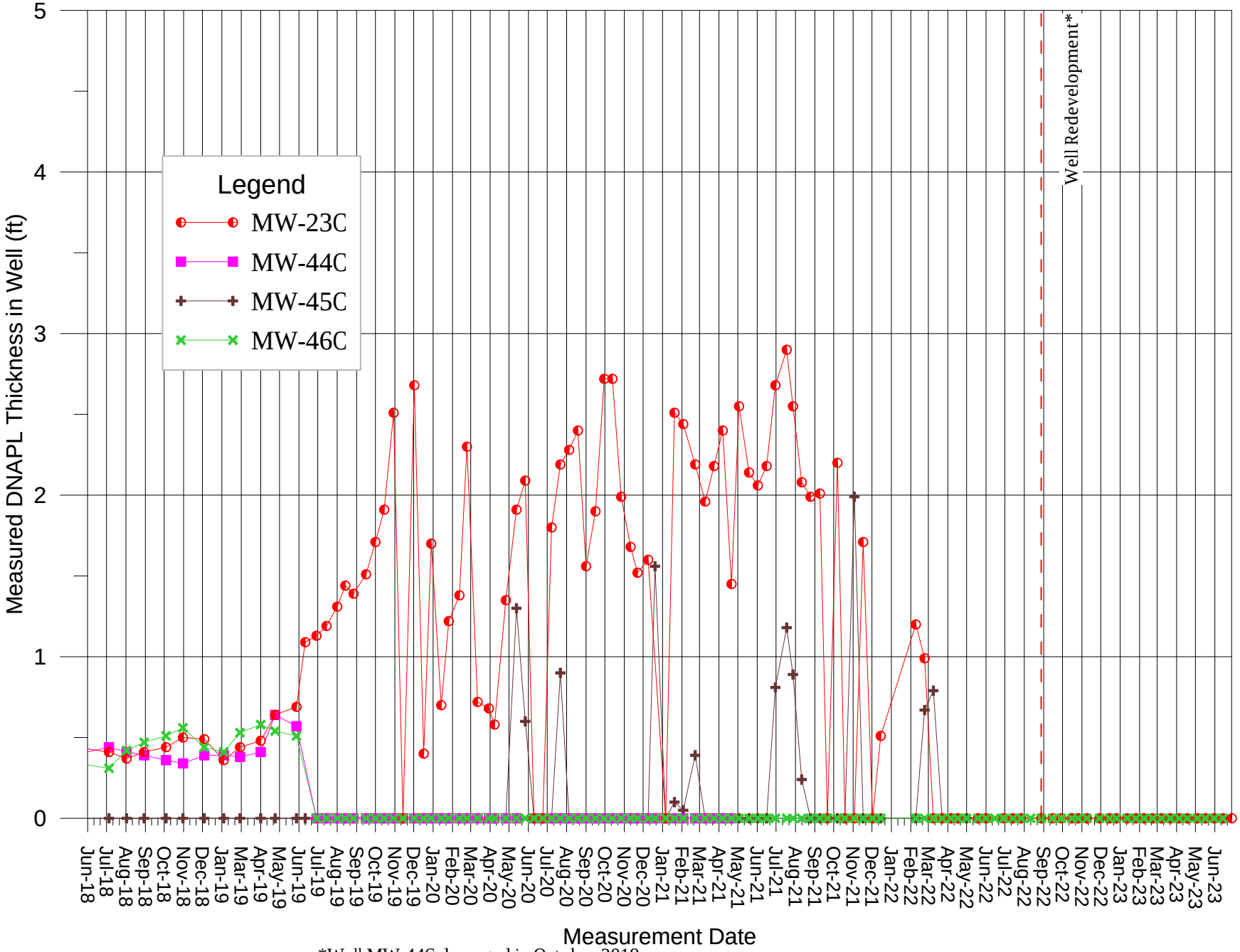
*Wells MW-32B, MW-68B, and MW-70B were redeveloped on 8/30/2022

Figure 6
B-CZ/B-TZ Wells (Englewood Intermodal Yard) - In-Well DNAPL Thickness July 2018 - June 2023
UPRR Houston Wood Preserving Works



*Well MW-75B inaccessible from December 2021-March 2023
Well MW-74B redeveloped 8/29/22; well MW-49B redeveloped 8/31/22

Figure 7
C-TZ Wells - In-Well DNAPL Thickness July 2018 - June 2023
UPRR Houston Wood Preserving Works



*Well MW-44C damaged in October 2019
Well MW-23C redeveloped 8/29/22; wells MW-45C and MW-46C redeveloped 8/30/22

ATTACHMENT 1

Recovered DNAPL Waste Manifest

025006194JJK

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
TXD000820266	1	888-897-7267	025006194 JJK

5. Generator's Name and Mailing Address
UPRR-WM c/o GHD : Manifest Receiving
9100 Centre Pointe Drive, Suite 240
West Chester OH 45069
Generator's Phone:

Generator's Site Address (if different than mailing address)
Union Pacific Railroad
4910 Liberty Road
Houston TX 77026

6. Transporter 1 Company Name: E3 OMI LLC — U.S. EPA ID Number: TXD981055163

7. Transporter 2 Company Name: US ECOLOGY TRANSPORTATION — U.S. EPA ID Number: MIK593743858

8. Designated Facility Name and Site Address
US Ecology Robstown
3277 County Road 69
Robstown, TX 78380
Facility's Phone: (800) 242-3209
U.S. EPA ID Number: TXD069452340

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3082, Hazardous Waste, Liquid n.o.s. (Creosote, benzene), 9, PG III (F034)	1	Dm	55	G	F034 0918 219H D018
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
Profile # 090130010-0
WR # 014479
Invoice E3OMI LLC, P.O. Box 1300, Clinton, MS 39060
Email invoice to admin@E3OMI.com and siekhong@E3OMI
PO# 35-2023-[illegible] JOB # 035-23-0021[illegible]

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: SIEK HONG CHEAH-SAPUT, AGENT — Signature: [signature], AGENT — Month / Day / Year:

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Alec Kirk — Signature: [signature] — Month 6 Day 6 Year 23
Transporter 2 Printed/Typed Name: Don Emme — Signature: [signature] — Month 6 Day 9 Year 23

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Section 15 - DATE (6/6/23) ok per Tabatha Pacheco 6-14-23 GV
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Gabriel Vela — Signature: [signature] — Month 6 Day 12 Year 23

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete. **DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM**