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15 April 2022

Via Electronic Mail

Ms. Erin McDonnell
Oregon Department of Environmental Quality
Northwest Region
700 NE Multnomah St, Suite 600
Portland, OR 97232

Reference: 0633086

Subject: Quarter 1, 2022 Progress Report
(January through March 2022)
MMGL / Premier Edible Oils Site (ESCI #2013)

Dear Ms. McDonnell:

ERM-West, Inc. (ERM) is submitting this Quarterly Progress Report (QPR) on behalf of MMGL LLC (MMGL) to summarize Quarter 1, 2022 activities at the Premier Edible Oils (PEO) site located at 10400 North Burgard Way in Portland, Oregon.

Section II, H of the Voluntary Cleanup Agreement for the Upland Remedial Investigation/Feasibility Study and Source Control Measures between MMGL (formerly Schnitzer Investment Corporation) and the Oregon Department of Environmental Quality (DEQ), dated 6 March 2001, requires submittal QPRs summarizing site activities. The following progress report summarizes activities for Quarter 1, 2022 (January through March).

Actions Taken Quarter 1, 2022 (January through March)

- On 03 January, ERM conducted the Groundwater Source Control Measures (GW SCM) monthly water level monitoring that was rescheduled from December due to improvements being made by the new site owner, T Dock LLC, which had temporarily limited access to the groundwater monitoring wells. There were no observations of LNAPL during this event. Observations were presented in Attachment A, Table Q4-1 of the GW SCM Q4 2021 Quarterly Progress Report.
- On 15 January, ERM submitted the Q4 GWSC Q4 2021 Progress Report.
- On 28 January, ERM conducted the GW SCM monthly water level monitoring. During this event, there were no observations of LNAPL in MW-43. Observations are presented in Attachment A, Table Q1-2.
- On 17 February, ERM mobilized to the site to repair the flow meter on the deep zone of the air sparge system. ERM determined that the sensor on the flow meter was corroded due to standing water caused by condensation in the outflow piping. ERM cleaned the sensor and probe and reinstalled the flow meter. The deep zone air sparge system was restarted after reinstallation of the flow meter. ERM determined that additional condensate drains were required for both air sparge system.
- On 4 February, ERM submitted the Q3-Q4 2022 GW SCM Semi-Annual Monitoring Report.
- On 19 February, ERM mobilized to the site to conduct redevelopment activities on two monitoring wells (MW-24A and MW-29). These wells were observed during the Q4 2021

sampling event to have poor recharge. During the completion of redevelopment activities, LNAPL was observed in MW-29 and no redevelopment was completed at this location.

- On 21 February, ERM made modifications to the outflow and condensate lines on the air sparge system deep and shallow zones to improve the removal of condensate water from the system.
- On 28 February, ERM conducted the GW SCM monthly water level monitoring. During this event, LNAPL was observed in MW-29 and MW-43. Observations are presented in Attachment A, Table Q1-2. Due to heavy rain prior to and during the water level monitoring event, five monitoring wells (MW-18, MW-25, MW-28, MW-36, and MW-41) were inaccessible due to ponding of surface rain water over the location. Additionally, due to improvement being made by the new site owner, T Dock LLC, one monitoring well (MW-08) was buried and could not be locate during this event. ERM worked with the site owner to clear MW-08 following this observation.
- Between 1 March and 9 March, ERM conducted the GW SCM quarterly groundwater monitoring. The air sparge system was shut down while conducting these activities. During this event, LNPAL was observed in MW-29, MW-38, and MW-43. Observations are presented in Attachment A, Table Q1-7.
- On 1 March, during completion of site improvement activities by the new site owner, T Dock LLC, the monument of one monitoring well (MW-28) was damaged resulting in the influent of surface rain water and fines to the monitoring well casing. Due to the presence of fines in the well casing, MW-28 was not sampled during this event.
- On March 11, ERM mobilized to the site to attempt to remove the fines that had incurred into MW-28 when the monument was damaged. Following the completion of redevelopment, approximately 7 feet of fines were unrecoverable and remain in the well casing. Additionally, during this event, the water level pressure transducer was recovered. This well is scheduled for replacement in Q1 2022.
- On 16 March, ERM conducted the GW SCM monthly water level monitoring. During this event, LNAPL was observed in MW-38 and MW-43. Observations are presented in Attachment A, Table Q1-3.
- On 29 March, ERM performed a site walk with representatives of MMGL and T Dock LLC to inspect on-going improvement activities occurring on site and to discuss options for the repair or replacement of MW-28.

Data Received in Quarter 1, 2022 (January through March)

- Field data collected in Quarter 1, 2022 are included in Attachment A and will be included in the Q1-Q2 2022 GW SCM Semi-Annual Monitoring Report, due on 31 July 2022.

Issues Observed during Quarter 1, 2022 (January through March)

Shallow Zone

No issues were observed with the shallow zone air sparge system in Q1.

Deep Zone

Following the November 2021 groundwater sampling event, the deep zone remained off until 17 February 2022 when ERM determined that the sensor on the flow meter was faulty due to mineral buildup caused by standing water from condensation occurring in the outflow piping. The sensor was cleaned on 17 February and the deep zone was restarted. Following cleaning of the flow meter

sensor, it was determined that the flow meter needed to be replaced. ERM has ordered a new flow meter for the deep zone, which will be installed in Q2 2022.

Additional modifications to the outflow piping on the both the deep and shallow zones of the air sparge system were made by ERM to improve the removal of water condensation from within the system and reduce the potential for presence of standing water to impact the flow meter sensors in the future.

The deep zone has been operating at 50% of design flows since 17 February 2022.

Actions Scheduled for Quarter 2, 2022 (April through June)

- The Quarterly Progress Report for Quarter 1, 2022 will be prepared and submitted.
- Monthly level transducer data downloading events and a quarterly groundwater sampling and water level monitoring event will be conducted.
- Replacement of monitoring well MW-28 will be conducted in Q2.
- Replacement of the air sparge system deep zone flow meter will be conducted in Q2.

If you have questions or comments pertaining to this progress report, please contact us at (503) 488-5282.

Yours sincerely

Haley Rothwell
Project Manager

Brendan Robinson, PE
Partner in Charge

Attachments:
Attachment A – Q1 2022 Data Tables
CC w/ attachments:
Tom Graf, GrafCon

Attachment A – Q1 2022 GW SCM
Groundwater Tables

Table Q1-1
Monitoring Well Summary
Premier Edible Oils
Portland, Oregon

Well Identification	Status	Well Depth (ft)	Screen Zone	Screen Interval (ft bgs)		Measuring Point (Top of Casing)	Sitewide Monitoring Point	Water Level Monitoring Point[1]	Transducer Installed	Quarterly Monitoring[2]
				Top	Bottom	ft-NAVD88				
MW-02	Active	26	Shallow	11	26	31.18	X	X		X
MW-03	Active	26	Shallow	11	26	31.67	X	X		X
MW-04	Active	26	Shallow	11	26	31.37				
MW-05	Active	26	Shallow	11	26	31.27				
MW-06	Active	27	Shallow	12	27	31.23	X	X		X
MW-08	Active	27	Shallow	12	27	30.93	X	X	X	X
MW-11	Active	27	Shallow	12	27	31.06	X	X	X	X
MW-18	Active	27	Shallow	12	27	30.87	X	X	X	X
MW-19	Active	27	Shallow	12	27	31.7	X	X		X
MW-21	Active	27	Shallow	12	27	31.36	X	X	X	X
MW-24A	Active	27	Shallow	12	27	32.35	X	X		X
MW-25	Active	-	Shallow	-	-	31.78	X	X		X
MW-26	Active	39	Deep	34	39	31.89	X	X		X
MW-27	Active	40	Deep	35	40	31.46	X	X	X	X
MW-28*	Active	28	Shallow	13	28	31.26	X	X	X	X
MW-29	Active	30	Shallow	13	28	31.9	X	X		X
MW-30	Active	28	Shallow	13	28	31.05	X	X	X	X
MW-31	Active	28	Shallow	13	28	30.77	X	X		X
MW-32	Active	40	Deep	35	40	31.08	X	X	X	X
MW-33	Active	40	Deep	35	40	30.88	X	X	X	X
MW-34	Active	28	Shallow	13	28	30.72	X	X	X	X
MW-35	Active	40	Deep	35	40	30.83	X	X	X	X
MW-36	Active	30	Shallow	15	30	30.16	X	X	X	X
MW-37	Active	40	Deep	35	40	31.27	X	X		X
MW-38	Active	27	Shallow	13	27	31.54	X	X		X
MW-39	Active	30	Shallow	15	30	31.08	X	X		X
MW-40	Active	40	Deep	35	40	31.71	X	X	X	X
MW-41	Active	27	Shallow	13	27	31.32	X	X	X	X
MW-42	Active	40	Deep	35	40	31.94	X	X	X	X
MW-43	Active	30	Shallow	15	30	31.39	X	X		X
MW-44	Active	25	Shallow	10	25	30.98	X	X		X
MW-45	Active	30	Shallow	15	30	31.70	X	X		X

Notes:
** = Damaged on 2 March 2022*
– = not applicable
[1] = Manual water level measurment collected monthly
[2] = Groundwater analytical samples
NAVD88 = North America Vertical Datum 1988

Table Q1-2
Groundwater Elevations - January 2022
Premier Edible Oils
Portland, Oregon

Well Identification	Screen Zone	Measuring Point (Top of Casing) ft-NAVD88	Date	Depth to Groundwater feet-btc	Depth to Product feet-btc	Product Thickness feet	Product Volume gal	Groundwater Elevation ft-NAVD88
MW-02	Shallow	31.18	1/28/2022	18.41	-	ND	-	12.77
MW-03	Shallow	31.67	1/28/2022	17.00	-	ND	-	14.67
MW-06	Shallow	31.23	1/28/2022	17.49	-	ND	-	13.74
MW-08	Shallow	30.93	1/28/2022	18.88	-	ND	-	12.05
MW-11	Shallow	31.06	1/28/2022	17.53	-	ND	-	13.53
MW-18	Shallow	30.87	1/28/2022	19.24	-	ND	-	11.63
MW-19	Shallow	31.70	1/28/2022	18.56	-	ND	-	13.14
MW-21	Shallow	31.36	1/28/2022	12.93	-	ND	-	18.43
MW-24A	Shallow	32.35	1/28/2022	17.36	-	ND	-	14.99
MW-25	Shallow	31.78	1/28/2022	17.90	-	ND	-	13.88
MW-26	Deep	31.89	1/28/2022	21.57	-	ND	-	10.32
MW-27	Deep	31.46	1/28/2022	21.17	-	ND	-	10.29
MW-28	Shallow	31.26	1/28/2022	19.18	-	ND	-	12.08
MW-29	Shallow	31.90	1/28/2022	18.19	-	ND	-	13.71
MW-30	Shallow	31.05	1/28/2022	18.34	-	ND	-	12.71
MW-31	Shallow	30.77	1/28/2022	18.73	-	ND	-	12.04
MW-32	Deep	31.08	1/28/2022	20.47	-	ND	-	10.61
MW-33	Deep	30.88	1/28/2022	19.44	-	ND	-	11.44
MW-34	Shallow	30.72	1/28/2022	16.90	-	ND	-	13.82
MW-35	Deep	30.83	1/28/2022	19.83	-	ND	-	11.00
MW-36	Shallow	30.16	1/28/2022	19.72	-	ND	-	10.44
MW-37	Deep	31.27	1/28/2022	20.43	-	ND	-	10.84
MW-38	Shallow	31.54	1/28/2022	17.32	-	ND	-	14.22
MW-39	Shallow	31.08	1/28/2022	20.77	-	ND	-	10.31
MW-40	Deep	31.71	1/28/2022	20.68	-	ND	-	11.03
MW-41	Shallow	31.32	1/28/2022	15.59	-	ND	-	15.73
MW-42	Deep	31.94	1/28/2022	21.73	-	ND	-	10.21
MW-43	Shallow	31.39	1/28/2022	20.63	20.56	0.07	0.01	10.82
MW-44	Shallow	30.98	1/28/2022	18.41	-	ND	-	12.57
MW-45	Shallow	31.70	1/28/2022	21.72	-	ND	-	9.98

Notes:
– = not applicable
NAVD88 = North America Vertical Datum 1988
ND = Non-detect
Corrected groundwater water elevation (GWE) calculated as: $GWE_{corr} = GWE + (NAPL_{thickness} * SG)$
Specific Gravity (SG) of light nonaqueous phase liquid (LNAPL) assumed to be 0.8 based on analysis of LNAPL

Table Q1-3
Groundwater Elevations - February 2022
Premier Edible Oils
Portland, Oregon

Well Identification	Screen Zone	Measuring Point (Top of Casing) ft-NAVD88	Date	Depth to Groundwater feet-btc	Depth to Product feet-btc	Product Thickness feet	Product Volume gal	Groundwater Elevation ft-NAVD88
MW-02	Shallow	31.18	2/28/2022	20.16	-	ND	-	11.02
MW-03	Shallow	31.67	2/28/2022	19.50	-	ND	-	12.17
MW-06	Shallow	31.23	2/28/2022	20.17	-	ND	-	11.06
MW-08	Shallow	30.93	2/28/2022	Unable to locate				
MW-11	Shallow	31.06	2/28/2022	20.30	-	ND	-	10.76
MW-18	Shallow	30.87	2/28/2022	Inaccessible				
MW-19	Shallow	31.70	2/28/2022	21.12	-	ND	-	10.58
MW-21	Shallow	31.36	2/28/2022	13.66	-	ND	-	17.70
MW-24A	Shallow	32.35	2/28/2022	18.28	-	ND	-	14.07
MW-25	Shallow	31.78	2/28/2022	Inaccessible				
MW-26	Deep	31.89	2/28/2022	22.36	-	ND	-	9.53
MW-27	Deep	31.46	2/28/2022	21.93	-	ND	-	9.53
MW-28	Shallow	31.26	2/28/2022	Inaccessible				
MW-29	Shallow	31.90	2/28/2022	20.83	20.63	0.20	0.03	11.23
MW-30	Shallow	31.05	2/28/2022	20.74	-	ND	-	10.31
MW-31	Shallow	30.77	2/28/2022	20.65	-	ND	-	10.12
MW-32	Deep	31.08	2/28/2022	21.44	-	ND	-	9.64
MW-33	Deep	30.88	2/28/2022	21.25	-	ND	-	9.63
MW-34	Shallow	30.72	2/28/2022	18.99	-	ND	-	11.73
MW-35	Deep	30.83	2/28/2022	19.56	-	ND	-	11.27
MW-36	Shallow	30.16	2/28/2022	Inaccessible				
MW-37	Deep	31.27	2/28/2022	19.26	-	ND	-	12.01
MW-38	Shallow	31.54	2/28/2022	19.26	19.2	0.06	0.01	12.33
MW-39	Shallow	31.08	2/28/2022	21.65	-	ND	-	9.43
MW-40	Deep	31.71	2/28/2022	21.91	-	ND	-	9.80
MW-41	Shallow	31.32	2/28/2022	Inaccessible				
MW-42	Deep	31.94	2/28/2022	22.41	-	ND	-	9.53
MW-43	Shallow	31.39	2/28/2022	22.00	21.60	0.40	0.07	9.71
MW-44	Shallow	30.98	2/28/2022	20.61	-	ND	-	10.37
MW-45	Shallow	31.70	2/28/2022	22.31	-	ND	-	9.39

Notes:
– = not applicable
NAVD88 = North America Vertical Datum 1988
ND = Non-detect
Corrected groundwater water elevation (GWE) calculated as: $GWE_{corr} = GWE + (NAPL_{thickness} * SG)$
Specific Gravity (SG) of light nonaqueous phase liquid (LNAPL) assumed to be 0.8 based on analysis of LNAPL

Table Q1-4
Groundwater Elevations - March 2022
Premier Edible Oils
Portland, Oregon

Well Identification	Screen Zone	Measuring Point (Top of Casing) ft-NAVD88	Date	Depth to Groundwater feet-btc	Depth to Product feet-btc	Product Thickness feet	Product Volume gal	Groundwater Elevation ft-NAVD88
MW-02	Shallow	31.18	3/16/2022	19.25	-	ND	-	11.93
MW-03	Shallow	31.67	3/16/2022	18.52	-	ND	-	13.15
MW-06	Shallow	31.23	3/16/2022	18.85	-	ND	-	12.38
MW-08	Shallow	30.93	3/16/2022	19.63	-	ND	-	11.30
MW-11	Shallow	31.06	3/16/2022	18.46	-	ND	-	12.60
MW-18	Shallow	30.87	3/16/2022	19.78	-	ND	-	11.09
MW-19	Shallow	31.70	3/16/2022	19.92	-	ND	-	11.78
MW-21	Shallow	31.36	3/16/2022	13.35	-	ND	-	18.01
MW-24A	Shallow	32.35	3/16/2022	18.03	-	ND	-	14.32
MW-25	Shallow	31.78	3/16/2022	18.44	-	ND		13.34
MW-26	Deep	31.89	3/16/2022	22.38	-	ND	-	9.51
MW-27	Deep	31.46	3/16/2022	21.55	-	ND	-	9.91
MW-28	Damaged 3/2/2022							
MW-29	Shallow	31.90	3/16/2022	18.95	-	ND	-	12.95
MW-30	Shallow	31.05	3/16/2022	19.55	-	ND	-	11.50
MW-31	Shallow	30.77	3/16/2022	19.61	-	ND	-	11.16
MW-32	Deep	31.08	3/16/2022	20.53	-	ND	-	10.55
MW-33	Deep	30.88	3/16/2022	20.65	-	ND	-	10.23
MW-34	Shallow	30.72	3/16/2022	18.07	-	ND	-	12.65
MW-35	Deep	30.83	3/16/2022	21.18	-	ND	-	9.65
MW-36	Shallow	30.16	3/16/2022	19.72	-	ND	-	10.44
MW-37	Deep	31.27	3/16/2022	21.70	-	ND	-	9.57
MW-38	Shallow	31.54	3/16/2022	18.50	-	ND	-	13.04
MW-39	Shallow	31.08	3/16/2022	20.90	-	ND	-	10.18
MW-40	Deep	31.71	3/16/2022	21.68	-	ND	-	10.03
MW-41	Shallow	31.32	3/16/2022	16.38	-	ND	-	14.94
MW-42	Deep	31.94	3/16/2022	22.03	-	ND	-	9.91
MW-43	Shallow	31.39	3/16/2022	20.75	20.60	0.15	0.02	10.76
MW-44	Shallow	30.98	3/16/2022	19.47	-	ND	-	11.51
MW-45	Shallow	31.70	3/16/2022	23.00	-	ND	-	8.70

Notes:
– = not applicable
NAVD88 = North America Vertical Datum 1988
ND = Non-detect
Corrected groundwater water elevation (GWE) calculated as: $GWE_{corr} = GWE + (NAPL_{thickness} * SG)$
Specific Gravity (SG) of light nonaqueous phase liquid (LNAPL) assumed to be 0.8 based on analysis of LNAPL

Table Q1-5
Transducer Calibration Offsets
Premier Edible Oils
Portland, Oregon

Calibration Event	Measurement	MW-08	MW-11	MW-18	MW-21	MW-27	MW-28[4]	MW-30	MW-32	MW-33	MW-34	MW-35	MW-36	MW-40	MW-41	MW-42	MW-45
Transducer Position	TOC Elev Adj. (ft above NAVD88)	30.93	31.06	30.87	31.36	31.46	31.26	31.05	31.08	30.88	30.72	30.83	30.16	31.71	31.32	31.94	31.70
	Datalogger depth (ft BTOC)	26.91	26.25[1]	27.00	18.05	39.87	28.12	28.00	38.14	39.31	27.90	39.83	29.92	39.84	27.35	39.04	27.00
10/12/2021	DTW measured (ft BTOC)	23.47	22.66	23.40	16.07	24.66	23.76	23.46	23.80	24.14	23.24	23.66	23.14	24.66	16.87	24.92	23.84
	DTW calculated (ft BTOC)	23.47	23.26	23.39	16.02	24.89	23.77	23.76	24.19	23.90	23.38	24.06	23.19	24.95	19.01	25.03	23.92
	Calibration Offset	0.00	0.60	-0.01	-0.05	0.23	0.01	0.30	0.39	-0.24	0.14	0.40	0.05	0.29	2.14	0.11	0.08
11/1/2021	DTW measured (ft BTOC)	23.11	22.94	23.10	16.11	24.54	23.72	23.28	23.64	23.73	23.44	23.99	23.04	24.90	16.75	25.26	25.26
	DTW calculated (ft BTOC)	23.07	23.63	23.08	16.00	24.52	23.71	23.45	23.90	23.78	23.55	24.25	23.02	24.99	18.89	25.28	24.40
	Calibration Offset	-0.04	0.69	-0.02	-0.11	-0.02	-0.01	0.17	0.26	0.05	0.11	0.26	-0.02	0.09	2.14	0.02	-0.86
01/03/2022[3]	DTW measured (ft BTOC)	18.19	17.49	18.30	13.08	19.50	18.81	18.03	19.11	20.43	18.20	19.05	18.01	19.71	13.84	20.04	20.51
	DTW calculated (ft BTOC)	18.15	18.14	18.35	13.10	19.51	18.76	18.40	19.36	19.15	18.27	19.51	18.16	20.14	16.09	20.20	20.19
	Calibration Offset	-0.04	0.65	0.05	0.02	0.01	-0.05	0.37	0.25	-1.28	0.07	0.46	0.15	0.43	2.25	0.16	-0.32
01/28/2022[3]	DTW measured (ft BTOC)	18.88	16.78	19.24	12.93	21.17	19.18	18.34	20.47	19.44	16.90	19.83	19.72	20.68	13.59	21.73	21.72
	DTW calculated (ft BTOC)	18.88	17.50	19.38	12.96	21.19	19.11	18.69	20.84	20.61	17.10	20.18	19.86	21.18	15.79	21.93	21.19
	Calibration Offset	0.00	0.72	0.14	0.03	0.02	-0.07	0.35	0.37	1.17	0.20	0.35	0.14	0.50	2.20	0.20	-0.53
02/28/2022[3]	DTW measured (ft BTOC)	NM	21.05	NM	13.66	21.93	NM	20.74	21.44	21.25	18.99	19.56	NM	21.91	NM	22.41	22.31
	DTW calculated (ft BTOC)	18.53	20.21	19.07	13.65	21.91	--	21.01	21.67	21.36	19.19	19.53	18.94	21.94	15.77	22.70	22.16
	Calibration Offset	NC	-0.84	NC	-0.01	-0.02	NC	0.27	0.23	0.11	0.20	-0.03	NC	0.03	NC	0.29	-0.15
03/16/2022[3]	DTW measured (ft BTOC)	19.63	19.21	19.70	13.35	21.55	NM	19.55	20.53	20.53	18.07	21.18	19.72	21.68	14.38	22.03	23.00
	DTW calculated (ft BTOC)	19.60	18.51	19.98	13.43	21.72	--	19.94	20.91	20.69	18.45	21.67	19.96	21.71	16.65	22.27	19.23
	Calibration Offset	-0.03	-0.70	0.28	0.08	0.17	NC	0.39	0.38	0.16	0.38	0.49	0.24	0.03	2.27	0.24	-3.77

Notes:
NAVD88 = North America Vertical Datum 1988
DTW = Depth to Water
BTOC = Below Top of Casing
1 = Datalogger depth adjusted up by 0.75 ft on 4/8/2020
2 = Pressure transducer stopped working on 3/9/2020. Replace on 4/8/2020.
3 = Pressure transducers were not calibrated in December due to access and weather issues. Calibration completed in January 2022.
4 = Monitoring well damaged on 3/21/2022
NM = Water level not collected due to ponding surface water over top of monitoring well.
NC = Pressure transdcuer not calibrated due to no water level being collected
-- = Not applicable

Table Q1-6
Horizontal and Vertical Gradients - Barrier Wall
Premier Edible Oils
Portland, Oregon

Well Identification	Measuring Point (Top of Casing)	Screen Interval (ft bgs)		Groundwater Elevation ft-NAVD88			Gradient[1,2] ft/ft		
	ft-NAVD88	Top	Bottom	1/28/2022	2/28/2022	3/16/2022	1/28/2022	2/28/2022	3/16/2022
Shallow Horizontal Gradient									
MW-30	31.05	13.00	28.00	12.71	10.31	11.50	0.0199	0.0056	0.0101
MW-31	30.77	13.00	28.00	12.04	10.12	11.16			
MW-30	31.05	13.00	28.00	12.71	10.31	11.50	0.0248	0.2365	0.0094
MW-18	30.87	12.00	27.00	11.63	0.00	11.09			
MW-34	30.72	13.00	28.00	13.82	11.73	12.65	0.1212	0.4207	0.0793
MW-36	30.16	15.00	30.00	10.44	0.00	10.44			
MW-38	31.54	13.00	27.00	14.22	12.33	13.04	0.1633	0.1211	0.1195
MW-39	31.08	15.00	30.00	10.31	9.43	10.18			
MW-29	31.90	13.00	28.00	13.71	11.23	12.95	0.0556	0.0292	0.0420
MW-43	31.39	15.00	30.00	10.82	9.71	10.76			
MW-41	31.32	13.00	27.00	15.73	0.00	14.94	0.0262	-0.4984	0.0220
MW-24A	32.35	12.00	27.00	14.99	14.07	14.32			
						Average Shallow Horizontal Gradient	**0.0685**	**0.0524**	**0.0470**
Deep Horizontal Gradient									
MW-32	31.08	35.00	40.00	10.61	9.64	10.55	-0.0095	0.0001	0.0037
MW-33	30.88	35.00	40.00	11.44	9.63	10.23			
MW-35	30.83	35.00	40.00	11.00	11.27	9.65	0.0177	0.0435	-0.0065
MW-27	31.46	35.00	40.00	10.29	9.53	9.91			
MW-37	31.27	35.00	40.00	10.84	12.01	9.57	0.0086	0.0386	-0.0053
MW-27	31.46	35.00	40.00	10.29	9.53	9.91			
MW-37	31.27	35.00	40.00	10.84	12.01	9.57	0.0075	0.0359	0.0009
MW-26	31.89	34.00	39.00	10.32	9.53	9.51			
MW-40	31.71	35.00	40.00	11.03	9.80	10.03	0.0256	0.0084	0.0037
MW-42	31.94	35.00	40.00	10.21	9.53	9.91			
						Average Deep Horizontal Gradient	**0.0100**	**0.0253**	**-0.0007**
Vertical Gradients[3]									
MW-32	31.08	35.00	40.00	10.61	9.64	10.55	-0.3000	-0.0957	-0.1357
MW-30	31.05	13.00	28.00	12.71	10.31	11.50			
MW-35	30.83	35.00	40.00	11.00	11.27	9.65	-0.4029	-0.0657	-0.4286
MW-34	30.72	13.00	28.00	13.82	11.73	12.65			
MW-37	31.27	35.00	40.00	10.84	12.01	9.57	-0.4225	-0.0398	-0.4338
MW-38	31.54	13.00	27.00	14.22	12.33	13.04			
MW-40	31.71	35.00	40.00	11.03	9.80	10.03	-0.5875	1.2250	-0.6138
MW-41	31.32	13.00	27.00	15.73	0.00	14.94			
						Average Vertical Gradient	**-0.4282**	**0.2560**	**-0.4029**

Notes:
NAVD88 = North America Vertical Datum 1988
[1] *= Positive horizonatal gradients indicate flow toward the river; negative horizontal gradients indicate flow away from the river.*
[2] *= Positive vertical gradients indicate upward flow; negative vertical gradients indicate downward flow.*
[3] *= Vertical Gradients measured using bottom of upper casing screen to top of lower casing screen elevations.*

Table Q1-7
LNAPL Observations during Groundwater Sampling Event
Premier Edible Oils
Portland, Oregon

Well Identification	Screen Zone	Measuring Point ft-NAVD88	Date	Time	Depth to Groundwater feet-btc	Depth to Product feet-btc	Product Thickness feet	Product Volume gal	Groundwater Elevation ft-NAVD88
MW-02	Shallow	31.18	3/9/2022	13:16	19.11	-	ND	-	12.07
MW-03	Shallow	31.67	3/2/2022	11:45	19.20	-	ND	-	12.47
MW-06	Shallow	31.23	3/2/2022	13:03	19.80	-	ND	-	11.43
MW-08	Shallow	30.93	3/3/2022	11:31	19.03	-	ND	-	11.90
MW-11	Shallow	31.06	3/9/2022	14:27	18.65	-	ND	-	12.41
MW-18	Shallow	30.87	3/4/2022	10:45	17.85	-	ND	-	13.02
MW-19	Shallow	31.70	3/2/2022	14:56	20.43	-	ND	-	11.27
MW-21	Shallow	31.36	3/4/2022	13:28	13.45	-	ND	-	17.91
MW-24A	Shallow	32.35	3/1/2022	14:44	18.14	-	ND	-	14.21
MW-25	Shallow	31.78	3/3/2022	09:09	19.34	-	ND	-	12.44
MW-26	Deep	31.89	3/8/2022	08:32	21.04	-	ND	-	10.85
MW-27	Deep	31.46	3/8/2022	14:43	21.06	-	ND	-	10.40
MW-28	Damaged 3/2/2022								
MW-29	Shallow	31.90	3/3/2022	10:45	18.61	18.43	0.18	0.03	13.43
MW-30	Shallow	31.05	3/4/2022	08:36	19.10	-	ND	-	11.95
MW-31	Shallow	30.77	3/3/2022	15:12	18.44	-	ND	-	12.33
MW-32	Deep	31.08	3/1/2022	09:49	19.84	-	ND	-	11.24
MW-33	Deep	30.88	3/1/2022	12:01	19.49	-	ND	-	11.39
MW-34	Shallow	30.72	3/9/2022	11:29	17.97	-	ND	-	12.75
MW-35	Deep	30.83	3/9/2022	10:03	19.91	-	ND	-	10.92
MW-36	Shallow	30.16	3/8/2022	12:31	18.03	-	ND	-	12.13
MW-37	Deep	31.27	3/9/2022	08:36	20.66	-	ND	-	10.61
MW-38	Shallow	31.54	3/3/2022	10:51	18.42	18.36	0.06	0.01	13.17
MW-39	Shallow	31.08	3/8/2022	10:42	19.94	-	ND	-	11.14
MW-40	Deep	31.71	3/7/2022	08:43	20.18	-	ND	-	11.53
MW-41	Shallow	31.32	3/7/2022	14:36	16.36	-	ND	-	14.96
MW-42	Deep	31.94	3/2/2022	09:17	19.00	-	ND	-	12.94
MW-43	Shallow	31.39	3/7/2022	16:06	19.55	19.53	0.02	0.00	11.86
MW-44	Shallow	30.98	3/3/2022	13:50	19.06	-	ND	-	11.92
MW-45	Shallow	31.70	3/7/2022	11:56	20.15	-	ND	-	11.55

Notes:
– = not applicable
NAVD88 = North America Vertical Datum 1988
ND = Non-detect
Corrected groundwater water elevation (GWE) calculated as: $GWE_{corr} = GWE + (NAPL_{thickness} * SG)$
Specific Gravity (SG) of light nonaqueous phase liquid (LNAPL) assumed to be 0.8 based on analysis of LNAPL

Table Q1-8
LNAPL Recovery Volumes
Premier Edible Oils
Portland, Oregon

Quarter	Date	MW-02 gal	MW-11 gal	MW-29 gal	MW-34 gal	MW-38 gal	MW-39 gal	MW-43 gal	Total gal
Q1 2022	3/10/2022	-	-	-	-	-	-	-	0.00
Q2 2022	-	-	-	-	-	-	-	-	0.00
Q3 2022	-	-	-	-	-	-	-	-	0.00
Q4 2022	-	-	-	-	-	-	-	-	0.00
Total Recovered		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Notes:
– = not applicable
** = approximate value*

Table Q1-9
Groundwater Field Parameters - March 2022
Premier Edible Oils, 10400 N Burgard Way
Portland OR

Monitoring Well	Date	pH	Specific Conductance µS/cm	Temperature °C	ORP mV	Dissolved Oxygen mg/L	Turbidity NTU
MW-02	3/9/2022	6.21	726	27.46	-66.8	0.25	--
MW-03	3/2/2022	6.42	111	15.17	153.4	3.64	4.87
MW-06	3/2/2022	6.2	156	15.47	54	0.5	--
MW-08	3/3/2022	6.84	541	19.18	171.6	0.32	--
MW-11	3/9/2022	6.39	714	24.32	31.3	0.37	--
MW-18	3/4/2022	6.33	279	18.2	55.7	0.42	--
MW-19	3/2/2022	6.28	206	15.99	128.9	0.67	19.5
MW-21	3/4/2022	6.67	84	15.78	112.1	4.09	--
MW-24A	3/1/2022	6.5	143	16.29	15.9	1.64	--
MW-25	3/3/2022	6.01	132	15.86	217.8	1.01	5.83
MW-26	3/8/2022	6.34	132	18.98	98.3	1.01	51.6
MW-27	3/8/2022	6.68	231	25.26	-24.9	0.31	10.3
MW-28	Damaged on 3/2/2022						
MW-29	3/3/2022	LNAPL					
MW-30	3/4/2022	5.94	497	18.45	139.7	1.27	73.3
MW-31	3/3/2022	6.38	317	18.96	139.1	0.52	--
MW-32	3/1/2022	9.89	218	17.66	3.4	1.18	22.7
MW-33	3/1/2022	8.91	250	19.64	-2	0.59	10.6
MW-34	3/9/2022	5.79	550	26.31	8.7	0.4	--
MW-35	3/9/2022	6.4	289	26.61	84.1	0.41	--
MW-36	3/8/2022	6.15	204	22.76	92	1.07	--
MW-37	3/9/2022	6.8	208	21.84	163.5	0.95	--
MW-38	3/3/2022	LNAPL					
MW-39	3/8/2022	6.37	502	19.97	-57.7	0.31	--
MW-40	3/7/2022	6.44	222	15.67	-35.6	0.43	--
MW-41	3/7/2022	6.22	107	16.23	151.7	0.59	--
MW-42	3/2/2022	8.92	229	15.58	126	0.56	11
MW-43	3/7/2022	LNAPL					
MW-44	3/3/2022	6.42	223	16.95	113	1	12.9
MW-45	3/7/2022	5.21	212	17.92	195	5.37	--

Notes:
-- = not analyzed
°C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric Turbidity Units
ORP = oxidation reduction potential, measured in millivolts (mV)
pH standard units
µS/cm = microsiemens per centimeter
Empty cells = Not measured.