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MEMO

TO	Katie Daugherty, ODEQ
FROM	Brendan Robinson, PE, ERM; Todd Slater, LSS
DATE	15 December 2024
REFERENCE	0732445.204
SUBJECT	Groundwater Source Control Measure Monthly Performance Monitoring Report

1. INTRODUCTION

The Oregon Department of Environmental Quality (ODEQ), in its letter dated 31 May 2019 and in the subsequent meeting with Legacy Site Services LLC (LSS) and Environmental Resources Management, Inc. (ERM) on 2 July 2019, requested that LSS initiate monthly status reports associated with the onsite groundwater source control measure (GW SCM) at the Arkema site (Site) consistent with the Performance Monitoring Plan (PMP; ERM 2014¹) beginning July 2019. The 2014 PMP was prepared pursuant to the Order on Consent issued by ODEQ, signed on 31 October 2008 (ODEQ No. LQVC-NWR-08-04; Consent Order). The purpose of the PMP was to present the monitoring, reporting, and adaptive management processes used during implementation of the GW SCM. On 30 November 2021, ODEQ directed LSS that following the October 2021 Monthly Performance Monitoring Report (MPR), subsequent MPRs would be suspended pending the implementation of the Groundwater Extraction Enhancement (GEE) project in 2022. During that time, ODEQ requested monthly schedule updates in lieu of MPRs. The trench wells installed as part of the GEE project were started on 27 November 2022, and MPR writing restarted in December 2022. The purpose of the GEE project was to install new extraction capacity to achieve the Capture Zone Objectives.

On 6 June 2024, ODEQ requested that LSS and ERM reduce the scope of future MPRs to facilitate faster review. On 11 September 2024, ODEQ agreed for the first amended MPR to be the August 2024 MPR submitted in October 2024.

¹ ERM-West, Inc. 2014. *Revised Final Performance Monitoring Plan – Groundwater Source Control Measure, Arkema Inc. Facility, Portland, Oregon*. July 2014.

2. GWET SYSTEM PERFORMANCE

The average system influent flow rate was 24.37 gallons per minute (gpm) for the entire month of October 2024, including non-operational periods. The average operational influent flow during operational periods was 27.94 gpm.

Extraction pumps become fouled with accumulated solids over time. A proactive pump removal and maintenance program is in place to address fouling and maximize flow rates. Ongoing redevelopment is anticipated in November 2024 to maintain the productivity of the groundwater extraction trenches, and conveyance line cleaning will be conducted as needed based on analysis of backpressure.

The increase in average monthly groundwater extraction rate in October 2024 compared to September 2024 is believed to be a result of an increase in groundwater elevations onsite as shown on Attachments A-1 and A-2. This is likely due to groundwater migration from upgradient sources, since the river elevation is near a 5-year low.

LSS is continuing to optimize extraction rates within the system to increase flow rates at each operational well until either the extraction rates specified in the *Groundwater Extraction Enhancement Final Design Report* (ERM 2022²) are achieved, the wells are producing the maximum quantity of water possible, or until the Capture Zone Objectives are met.

2.1 GWET PLANT OPERATIONS

The groundwater extraction and treatment (GWET) plant operated within permit conditions during the reporting period. There were three shutdowns:

- 7 October 2024: The wellfield was shut down for 0.5-hours to due to pump P-1 faulting.
- 22 October 2024: The plant and wellfield was shut down for 1-hour due to a PLC program download.
- 28 October 2024: The wellfield was shut down for 25-hours due to drilling for ongoing PDI work and PLC troubleshooting.

² ERM-West, Inc. 2022. *Final Design Report, Arkema Inc. Facility, Portland, Oregon*. May 2022.

3. CAPTURE ZONE EVALUATION

As described in the PMP, the purpose of hydraulic monitoring (i.e., groundwater elevation data) is to provide sufficient data to demonstrate an inward hydraulic gradient across the groundwater barrier wall (GWBW) and to evaluate the effective hydraulic capture produced by the GW SCM.

3.1 GROUNDWATER ELEVATION MONITORING

Groundwater elevation monitoring was completed on 11 October 2024. The Serfes (1991)³ method was used to account for tidal variations as described in the PMP. Using Serfes corrected data, both horizontal and vertical gradients were calculated and plotted over time (Attachment B). Groundwater elevations, horizontal gradients, and vertical gradients from 11 October 2024 are shown in Attachment B-3 and Attachment B-4.

3.2 POTENTIOMETRIC SURFACE, GROUNDWATER ELEVATION DIFFERENCE MAPS, AND GROUNDWATER FLOW DIRECTIONS

Groundwater elevation data collected on 11 October 2024 was used to prepare potentiometric surface maps based on manual measurements and averaged transducer groundwater elevations (Figures 2 through 4) and vertical difference maps (Figures 5 and 6).

The generalized flow direction indicated by the potentiometric surface maps shows overall groundwater flow from upgradient toward the GBW. Potentiometric maps (Figures 2, 3, and 4) indicate generalized groundwater movement to the extraction trenches in the Shallow, Intermediate, and Deep Zones due to GW SCM pumping, and cones of depression are apparent around each groundwater extraction trench primarily on the north end of the Site in the Shallow and Intermediate Zones. Horizontal gradients at gradient control clusters (GCCs) across the Site are generally outward, but the magnitude of horizontal gradients is approaching zero as shown in Attachments B-1 and B-2.

River elevations are shown over time on Attachments A-1 and A-2, and in an inset on the potentiometric surface maps (Figures 2 through 4). The river elevation in October 2024 had an average elevation of 7.18 feet North American Vertical Datum of 1988 (NAVD88) with a minimum elevation of 4.76 feet NAVD88 and a maximum elevation of 10.22 feet NAVD88, a decrease compared to September 2024, and the lowest elevation observed in the last two years. The average Shallow and the average Intermediate Zone groundwater elevation increased from September 2024. The river elevation has largely been trending downward since January 2024 but is anticipated to rise over the coming months as the seasonal rains begin. There was not as significant of a seasonal rise in Willamette River level this spring compared to previous years.

To increase the volume of water drawn from the lowest elevations onsite, a pass-through packer is being deployed at Trench 6. The packer will block the vertical portions of the well screen at Trench

³ Serfes, Michael. 1991. "Determining the Mean Hydraulic Gradient of Ground Water Affected by Tidal Fluctuations." *Groundwater* 29(4): July–August.

6 from being used and will force groundwater to be extracted in the horizontal sections of the pipe at the bottom of the extraction trench to enable water to be drawn down further.

Vertical gradients were calculated for each vertical well pair and are plotted on Figures 5 and 6. Vertical groundwater gradients and trend lines are shown in Attachments B-2 and B-4. Vertical groundwater gradients interior and exterior to the GWBW were primarily downward between the Shallow and Intermediate Zones and between the Intermediate and Deep Zones.

4. CONCLUSIONS

Analysis of horizontal gradients over time indicate that the extraction wells (EWs) are performing better than the historical recovery wells (RWs) and outward horizontal gradients are decreasing. The extraction rates throughout the GWET system will continue to be optimized to meet Target Capture Objectives. Redevelopment of the trenches is planned for November 2024 to mitigate accumulation of silt in the filter pack in both the vertical and horizontal sections using impulse redevelopment techniques, and resonant technology. These efforts, as well as the packers discussed above, will be targeted at trenches that are currently underperforming, including Trenches 1, 4, 5, and 6. LSS will continue to optimize new EWs, including pump maintenance and upgrades. Additional modifications to the system, if needed to progress toward capture objectives, will be included in subsequent MPRs. The project schedule provided as Attachment C summarizes planned activities.

Regards,



Brendan Robinson, PE
Partner

ATTACHMENTS

FIGURE 1 – SITE LAYOUT

FIGURE 2 – SHALLOW ZONE GROUNDWATER CONTOURS

FIGURE 3 – INTERMEDIATE ZONE GROUNDWATER CONTOURS

FIGURE 4 – DEEP ZONE GROUNDWATER CONTOURS

FIGURE 5 – SHALLOW TO INTERMEDIATE ZONE VERTICAL HEAD DIFFERENCE MAPS

FIGURE 6 – INTERMEDIATE TO DEEP ZONE VERTICAL HEAD DIFFERENCE MAPS

ATTACHMENT A-1 – OPERATIONAL PUMPING RATE GRAPH

ATTACHMENT A-2 – AVERAGE MONTHLY PUMPING RATE GRAPH

ATTACHMENT A-3 – GWET SYSTEM GROUNDWATER EXTRACTION RATES TABLE

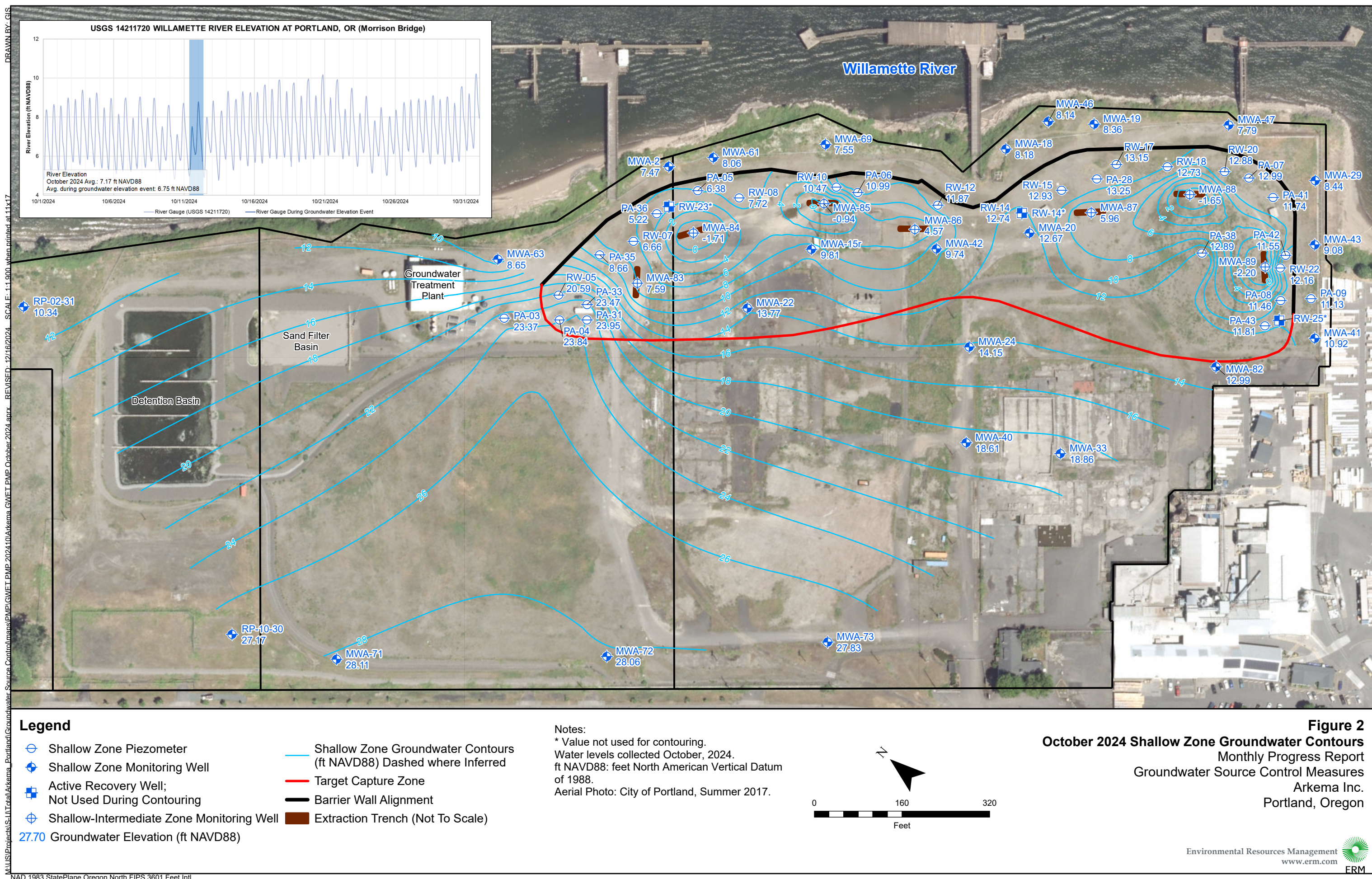
ATTACHMENT B-1 – HORIZONTAL GRADIENTS SUMMARY GRAPH

ATTACHMENT B-2 – VERTICAL GRADIENTS SUMMARY GRAPH

ATTACHMENT B-3 – WATER LEVELS AND HORIZONTAL GRADIENTS TABLE

ATTACHMENT B-4 – WATER LEVELS AND VERTICAL GRADIENTS TABLE

ATTACHMENT C – PROJECT SCHEDULE



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N:\US\Projects\S-U\TotalArkema_Portland\Groundwater_Source_Control\maps\PMP\GWET_PMP_2024\10Arkema_GWET_PMP_October_2024.aprx REVISED: 12/16/2024

Legend

- Shallow Zone Piezometer
- Shallow Zone Monitoring Well
- Active Recovery Well;
Not Used During Contouring
- Shallow-Intermediate Zone Monitoring Well
- 27.70 Groundwater Elevation (ft NAVD88)
- Shallow Zone Groundwater Contours
(ft NAVD88) Dashed where Inferred
- Target Capture Zone
- Barrier Wall Alignment
- Extraction Trench (Not To Scale)

Notes:
* Value not used for contouring.
Water levels collected October, 2024.
ft NAVD88: feet North American Vertical Datum
of 1988.
Aerial Photo: City of Portland, Summer 2017.

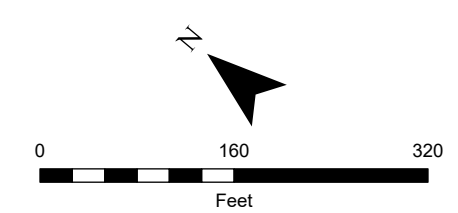


Figure 2
October 2024 Shallow Zone Groundwater Contours
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

USGS 14211720 WILLAMETTE RIVER ELEVATION AT PORTLAND, OR (Morrison Bridge)

12
10
8
6
4

10/1/2024 10/6/2024 10/11/2024 10/16/2024 10/21/2024 10/26/2024 10/31/2024

River Elevation (ft NAVD88)

River Elevation
October 2024 Avg.: 7.17 ft NAVD88
Avg. during groundwater elevation event: 6.75 ft NAVD88

— River Gauge (USGS 14211720) — River Gauge During Groundwater Elevation Event

Groundwater Treatment Plant

Sand Filter Basin

Detention Basin

Willamette River

MWA-8i 7.40
PA-11i 8.61
RW-09i 8.52
PA-12i 10.76
MWA-86 4.57
RW-11i 8.62
MWA-16i 6.58
RW-16i 12.00
PA-13i 9.63
RW-19i 9.58
PA-14i 11.87
RW-21i 9.54
PA-29i 7.68
MWA-53i 7.41
PA-39i -2.39
PA-40i 9.29
PA-15i 9.15
PA-16i 9.38
RW-26i 9.52
MWA-81i 9.35
MWA-49i 6.93
MWA-34iR 7.72
MWA-66i 6.59
MWA-16i 6.58
RW-13i 11.83
MWA-54i 11.76
MWA-87 5.96
MWA-88 -1.65
MWA-89 -2.20
PA-44i 9.31
MWA-70i 15.73
MWA-74i 22.07
MWA-75i 30.04
MWA-07(i) 27.41
PA-37i 7.89
RW-24i 6.72
MWA-84 -1.71
MWA-83 7.59
PA-34i 10.73
PA-32i 10.89
PA-17iR 9.88
PA-10i 11.07
RW-06i 10.66

2
4
6
8
10
12
14
16
18
20
22
24
26
28

0 160 320
Feet

Legend

- Intermediate Zone Piezometer
- Intermediate Zone Monitoring Well
- Shallow-Intermediate Zone Monitoring Well
- 27.70 Groundwater Elevation (ft NAVD88)
- Intermediate Zone Groundwater Contours (ft NAVD88) Dashed where Inferred
- Target Capture Zone
- Barrier Wall Alignment
- Extraction Trench (Not To Scale)

Notes:

- * Value not used for contouring.
- Water levels collected October, 2024.
- ft NAVD88: feet North American Vertical Datum of 1988.
- Aerial Photo: City of Portland, Summer 2017.

Figure 3

October 2024 Intermediate Zone Groundwater Contours

Monthly Progress Report

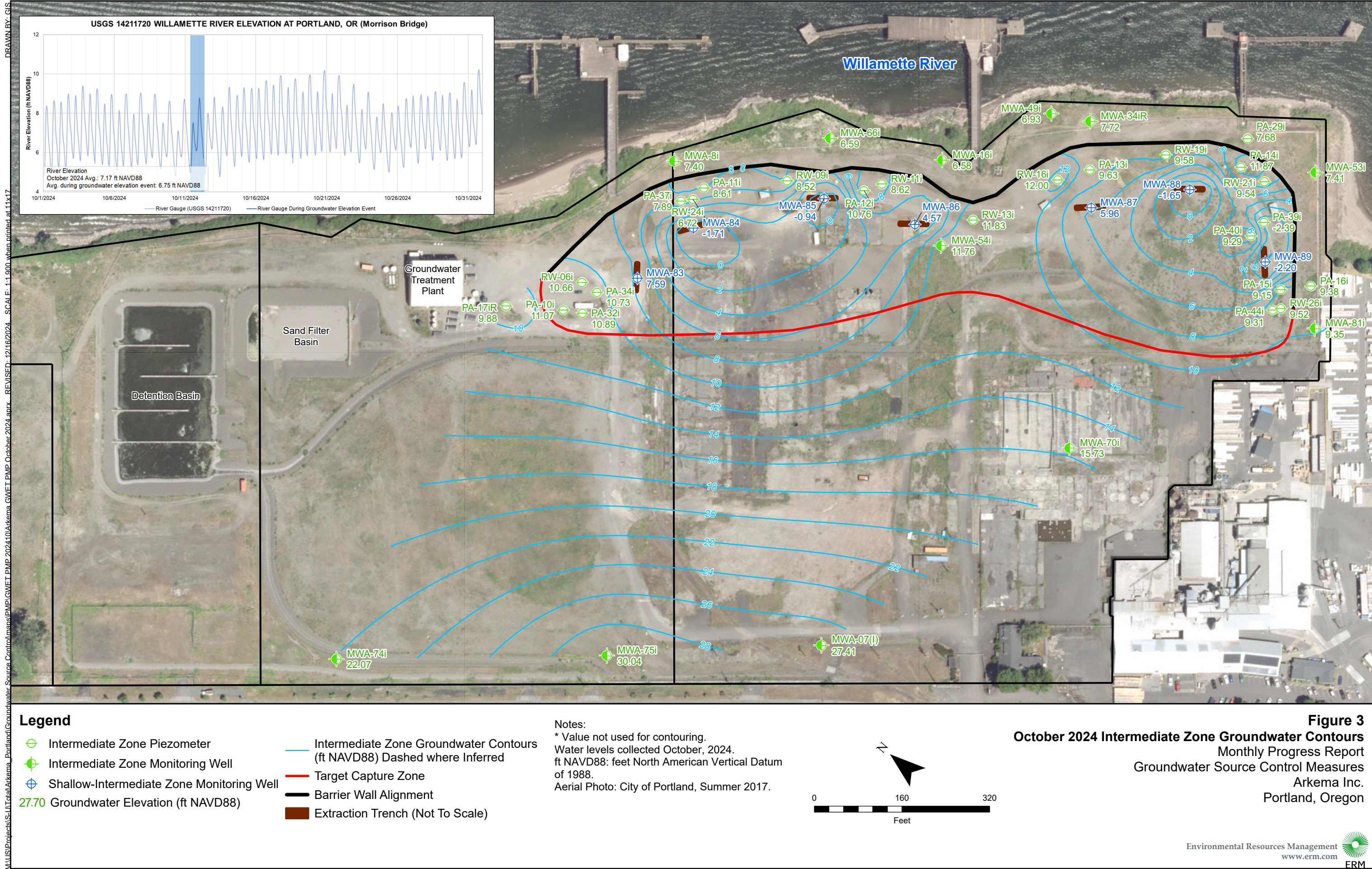
Groundwater Source Control Measures

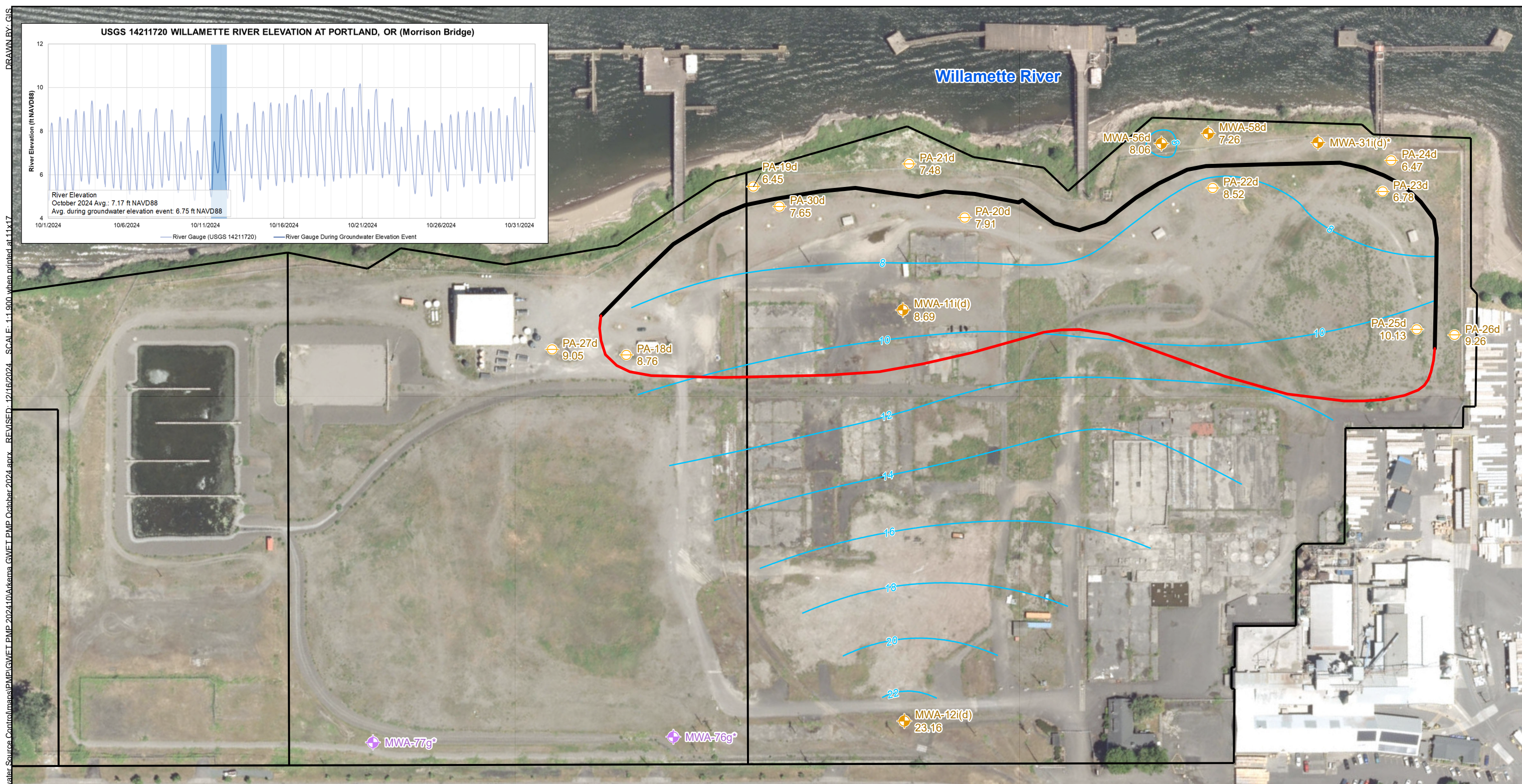
Arkema Inc.

Portland, Oregon

Environmental Resources Management
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DRAWN BY: GIS
NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl



Legend

Shallow Zone Monitoring Well	Active Recovery Well	Downward Gradient
Intermediate Zone Monitoring Well	Trench Extraction Well	Upward Gradient
Shallow Zone Piezometer	Target Capture Zone	
Intermediate Zone Piezometer	Barrier Wall Alignment	
Shallow Zone Recovery Well	Extraction Trench	
Trench Extraction Well	Gradient Control Cluster	
	Vertical Flow Cluster	

Notes:

Brown gradient: Downward gradient.
Green gradient: Upward gradient.
Vertical gradient calculated as shallow zone minus intermediate zone potentiometric surfaces.
Water levels collected October, 2024.
Aerial Photo: City of Portland, Summer 2017.

0 130 260
Feet

Figure 5

October 2024 Shallow to Intermediate Zone Vertical Head Difference
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

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M:\US\Projects\S-U\TotalArkema_Portland\Groundwater_Source_Control\maps\PMP\GWET_PMP_2024\10Arkema_GWET_PMP_October_2024.aprx REVISED: 12/16/2024 SCALE: 1:1,560 when printed at 11x17
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NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl



- Legend**
- | | | |
|---|------------------------|-------------------|
| Intermediate Zone Monitoring Well | Trench Extraction Well | Downward Gradient |
| Deep Zone Monitoring Well | Active Recovery Well | Upward Gradient |
| Intermediate Zone Piezometer | Target Capture Zone | |
| Deep Zone Piezometer | Barrier Wall Alignment | |
| Shallow-Intermediate Zone Monitoring Well | Extraction Trench | |

Notes:
Brown gradient: Downward gradient.
Green gradient: Upward gradient.
Vertical gradient calculated as intermediate zone minus deep zone potentiometric surfaces.
Water levels collected October, 2024.
Aerial Photo: City of Portland, Summer 2017.

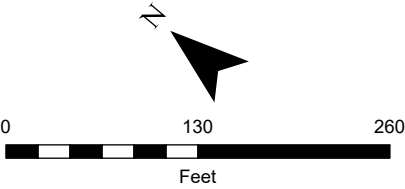


Figure 6
October 2024 Intermediate to Deep Zone Vertical Head Difference
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

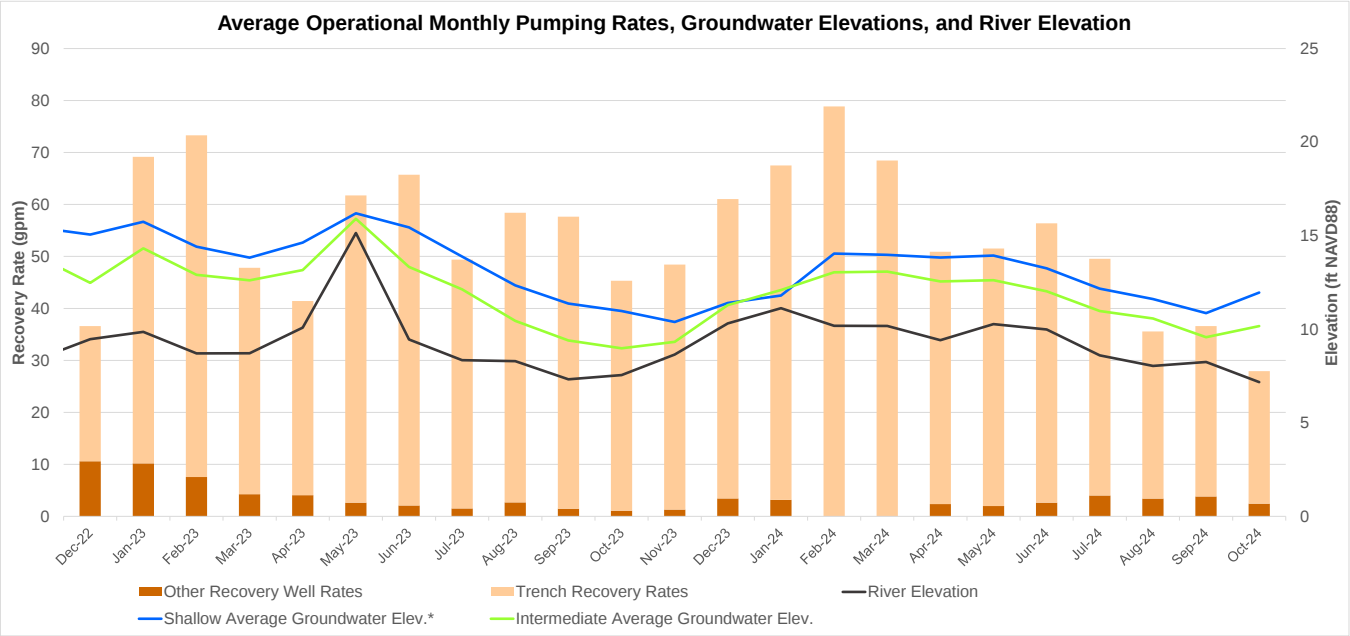


ATTACHMENT A-1

OPERATIONAL PUMPING RATE GRAPH

Attachment A-1

Operational Pumping Rate Graph
Arkema Inc. Facility
Portland, Oregon



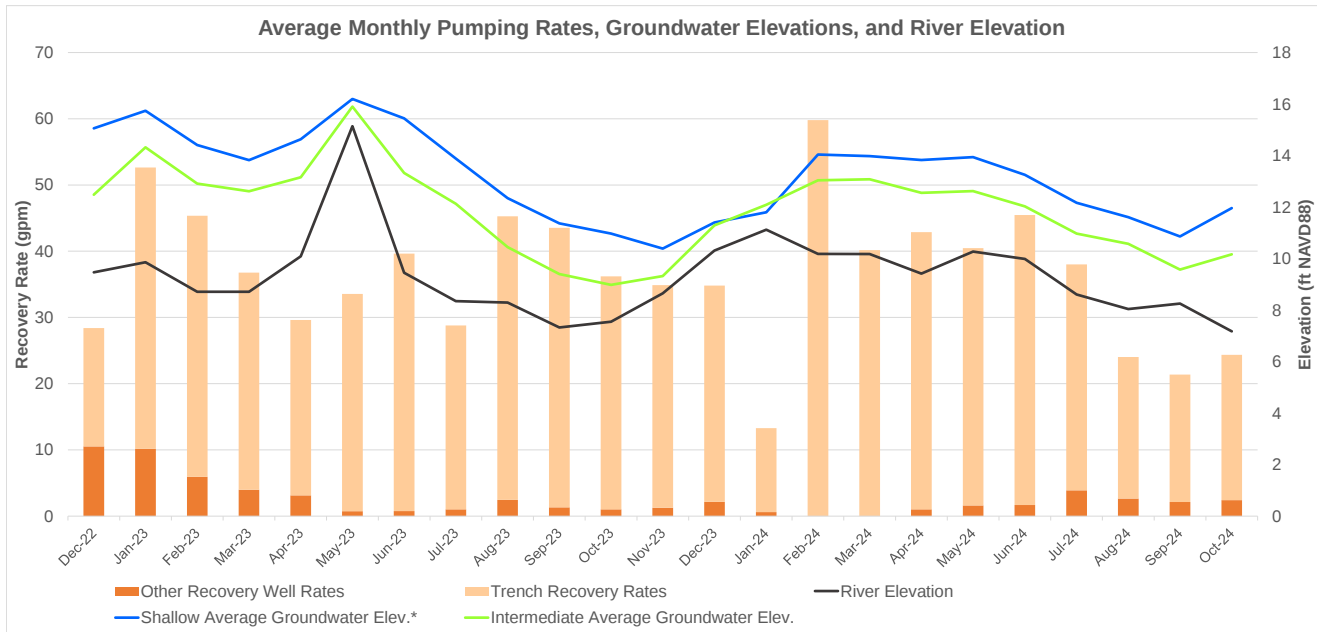


ATTACHMENT A-2

AVERAGE MONTHLY PUMPING RATE
GRAPH

Attachment A-2

Average Monthly Pumping Rate Graph
Arkema Inc. Facility
Portland, Oregon





ATTACHMENT A-3

GWET SYSTEM GROUNDWATER
EXTRACTION RATES TABLE

Attachment A-3

GWET System Groundwater Extraction Rates Table Arkema Inc. Facility Portland, Oregon

Recovery Well	October 2024 Average Operational Pumping Rate (gpm)	October 2024 Average Monthly Pumping Rate (gpm)
RW-14	0.91	0.91
RW-22*	0.00	0.00
RW-23	0.28	0.28
RW-25	1.26	1.22
EW-01	0.61	0.43
EW-02*	0.00	0.00
EW-03	8.71	8.71
EW-04*	0.00	0.00
EW-05	2.64	0.26
EW-06	4.55	4.26
EW-07*	0.00	0.00
EW-08	0.88	0.71
EW-09	1.42	1.15
EW-10*	0.00	0.00
EW-11	1.22	0.98
EW-12*	0.00	0.00
EW-13	5.47	5.47
EW-14*	0.00	0.00
Total	27.94	24.37

* = Recovery well not in service during reporting period

gpm = gallon per minute



ATTACHMENT B-1

HORIZONTAL GRADIENTS SUMMARY
GRAPH

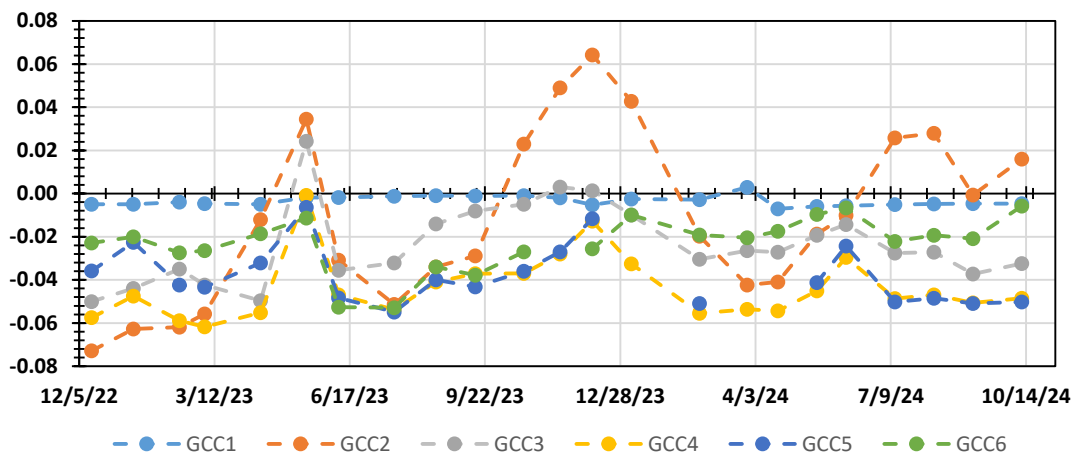
Attachment B-1

Horizontal Gradients Summary: October 2024

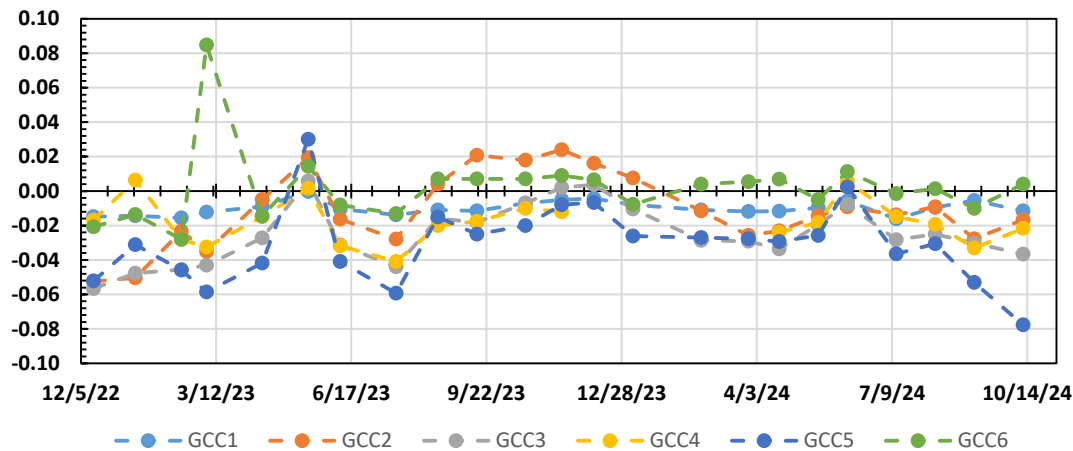
Arkema Inc. Facility

Portland, Oregon

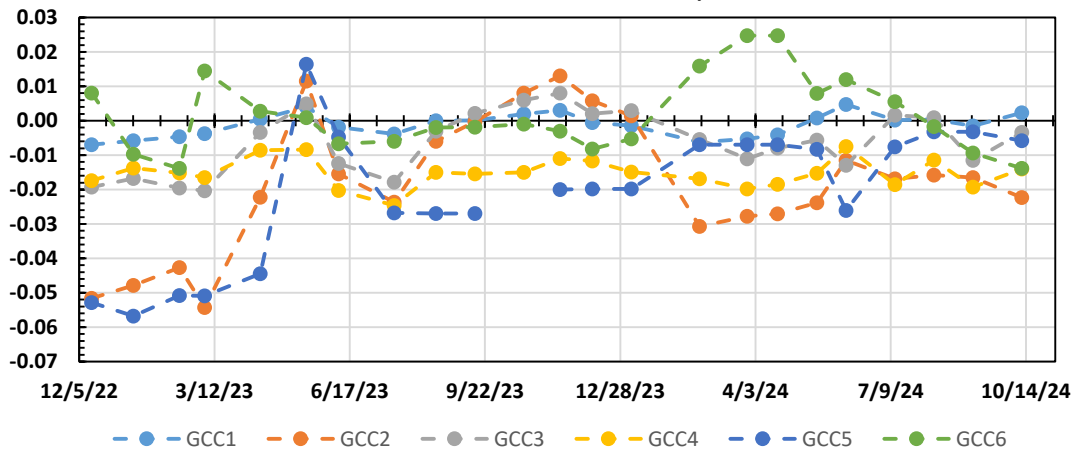
Horizontal Gradients - Shallow Zone



Horizontal Gradients - Intermediate Zone



Horizontal Gradients - Deep Zone



Positive horizontal gradient indicates an inward hydraulic gradient across the GWBW.



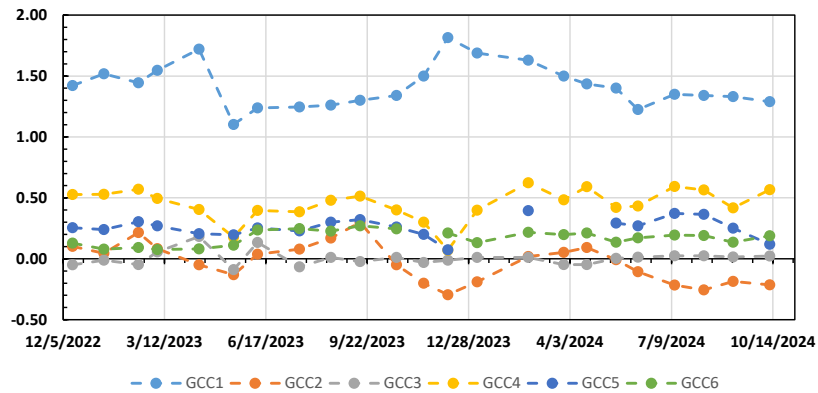
ATTACHMENT B-2

VERTICAL GRADIENTS SUMMARY
GRAPH

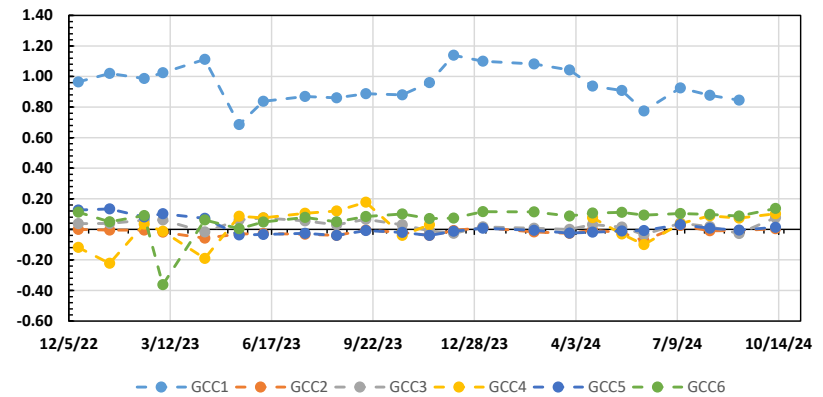
Attachment B-2

Vertical Gradients Summary: October 2024
Arkema Inc. Facility
Portland, Oregon

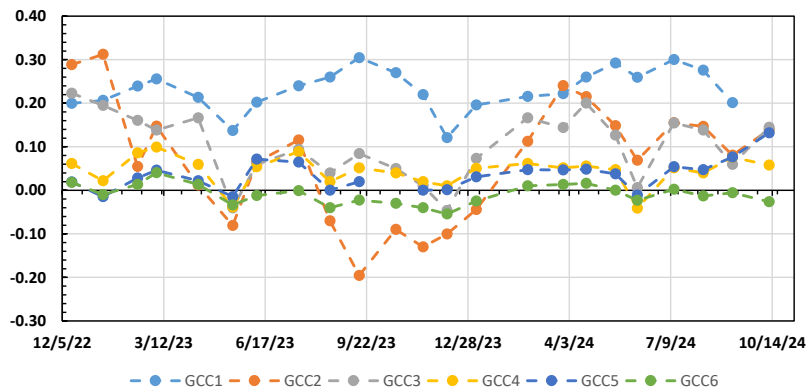
Vertical Gradients - Interior SZ-IZ



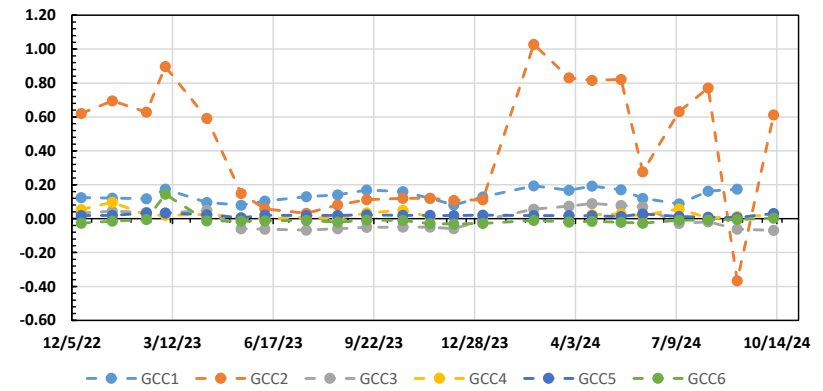
Vertical Gradients - Exterior SZ-IZ



Vertical Gradients - Interior IZ-DZ



Vertical Gradients - Exterior IZ-DZ





ATTACHMENT B-3

WATER LEVELS AND HORIZONTAL
GRADIENTS TABLE

Attachment B-3

Water Levels and Horizontal Gradients Table Arkema Inc. Facility Portland, Oregon

Gradient Cluster	Well Pair Zone	Exterior Well	Water Elevation (ft NAVD88)	Interior Well	Water Elevation (ft NAVD88)	Horizontal Gradient (ft/ft)
GCC1	Shallow	PA-03	23.37	PA-04	23.84	-0.005
	Intermediate	PA-17iR	9.88	PA-10i	11.07	-0.011
	Deep	PA-27d	9.05	PA-18d	8.76	0.002
GCC2	Shallow	MWA-2	7.47	PA-05	6.38	0.016
	Intermediate	MWA-8i	7.40	PA-11i	8.61	-0.017
	Deep	PA-19d	6.45	PA-30d	7.65	-0.022
GCC3	Shallow	MWA-69	7.55	PA-06	10.99	-0.032
	Intermediate	MWA-66i	6.59	PA-12i	10.76	-0.037
	Deep	PA-21d	7.48	PA-20d	7.91	-0.003
GCC4	Shallow	MWA-19	8.36	PA-28	13.25	-0.048
	Intermediate	MWA-34iR	7.72	PA-13i	9.63	-0.022
	Deep	MWA-58d	7.26	PA-22d	8.52	-0.014
GCC5	Shallow	MWA-47	7.79	PA-07	12.99	-0.050
	Intermediate	PA-29i	7.68	PA-14i	11.87	-0.078
	Deep	PA-24d	6.47	PA-23d	6.78	-0.006
GCC6	Shallow	PA-09	11.13	PA-08	11.46	-0.006
	Intermediate	PA-16i	9.38	PA-15i	9.15	0.004
	Deep	PA-26d	9.26	PA-25d	10.13	-0.014

Positive horizontal gradient indicates an inward hydraulic gradient across the GWBW.

Horizontal gradient calculated as (Exterior Elevation – Interior Elevation) / Horizontal distance.

* = anomalous groundwater elevation

** = horizontal gradient cannot be calculated due to anomalous elevation reading

ft NAVD88 = feet North American Vertical Datum of 1988

^M = manual groundwater elevation measurement



ATTACHMENT B-4

WATER LEVELS AND VERTICAL
GRADIENTS TABLE

Attachment B-4

Water Levels and Vertical Gradients Table Arkema Inc. Facility Portland, Oregon

Region	Pair	Gradient Cluster	Upper Well	Water Elevation (ft NAVD88)	Lower Well	Water Elevation (ft NAVD88)	Vertical Gradient (ft/ft)
Interior	SZ-IZ	GCC1	PA-04	23.84	PA-10i	11.07	1.29
		GCC2	PA-05	6.38	PA-11i	8.61	-0.21
		GCC3	PA-06	10.99	PA-12i	10.76	0.02
		GCC4	PA-28	13.25	PA-13i	9.63	0.57
		GCC5	PA-07	12.99	PA-14i	11.87	0.12
		GCC6	PA-08	11.46	PA-15i	9.15	0.19
	IZ-DZ	GCC1	PA-10i	11.07	PA-18d	8.76	0.31
		GCC2	PA-11i	8.61	PA-30d	7.65	0.14
		GCC3	PA-12i	10.76	PA-20d	7.91	0.14
		GCC4	PA-13i	9.63	PA-22d	8.52	0.06
		GCC5	PA-14i	11.87	PA-23d	6.78	0.13
		GCC6	PA-15i	9.15	PA-25d	10.13	-0.03
Exterior	SZ-IZ	GCC1	PA-03	23.37	PA-17iR ^M	9.88	0.86
		GCC2	MWA-2	7.47	MWA-8i	7.40	0.00
		GCC3	MWA-69	7.55	MWA-66i	6.59	0.08
		GCC4	MWA-19	8.36	MWA-34iR	7.72	0.10
		GCC5	MWA-47	7.79	PA-29i	7.68	0.01
		GCC6	PA-09	11.13	PA-16i	9.38	0.14
	IZ-DZ	GCC1	PA-17iR ^M	9.88	PA-27d	9.05	0.13
		GCC2	MWA-8i	7.40	PA-19d	6.45	0.61
		GCC3	MWA-66i	6.59	PA-21d	7.48	-0.07
		GCC4	MWA-34iR	7.72	MWA-58d	7.26	0.02
		GCC5	PA-29i	7.68	PA-24d	6.47	0.03
		GCC6	PA-16i	9.38	PA-26d	9.26	0.00

Positive vertical gradient indicates an downward hydraulic gradient.

Vertical gradient calculated as (Upper Elevation – Lower Elevation) / Screen Midpoint distance.

* = anomalous groundwater elevation

** = vertical gradient cannot be calculated due to anomalous elevation reading

DZ = Deep Zone

ft NAVD88 = feet North American Vertical Datum of 1988

IZ = Intermediate Zone

^M = manual groundwater elevation measurement

SZ = Shallow Zone



ATTACHMENT C

PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish	Timeline																											
					2024				2025				2026				2027				2028				2029							
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
1	Quarterly GW Monitoring																															
2	4th Quarter 2023 Groundwater Monitoring	70 days	Mon 12/11/23	Fri 3/15/24																												
7	1st Quarter 2024 Groundwater Monitoring	4 days	Mon 2/26/24	Thu 2/29/24																												
8	Sample Wells	4 days	Mon 2/26/24	Thu 2/29/24																												
9	Obtain Analytical Data	1 day	Mon 4/1/24	Mon 4/1/24																												
10	Data Validation	1 day	Mon 4/15/24	Mon 4/15/24																												
11	Report Completed	1 day	Fri 6/7/24	Fri 6/7/24																												
12	2nd Quarter 2024 Groundwater Monitoring	75 days	Mon 6/10/24	Fri 9/20/24																												
13	Sample Wells	5 days	Mon 6/10/24	Fri 6/14/24																												
14	Obtain Analytical Data	1 day	Thu 6/27/24	Thu 6/27/24																												
15	Data Validation	1 day	Tue 7/30/24	Tue 7/30/24																												
16	Report Completed	1 day	Fri 9/20/24	Fri 9/20/24																												
17	3rd Quarter 2024 Groundwater Monitoring *	81 days	Mon 9/9/24	Mon 12/30/24																												
18	Sample Wells	5 days	Mon 9/9/24	Fri 9/13/24																												
19	Obtain Analytical Data	1 day	Wed 10/2/24	Wed 10/2/24																												
20	Data Validation	1 day	Fri 11/1/24	Fri 11/1/24																												
21	Report Completed	1 day	Mon 12/30/24	Mon 12/30/24																												
22	Monthly Progress Reports	241 days	Thu 2/15/24	Wed 1/15/25																												
23	December 2023 MPR	1 day	Thu 2/15/24	Thu 2/15/24																												
24	January 2024 MPR	1 day	Fri 3/15/24	Fri 3/15/24																												
25	February 2024 MPR	1 day	Mon 4/15/24	Mon 4/15/24																												
26	March 2024 MPR	1 day	Wed 5/15/24	Wed 5/15/24																												
27	April 2024 MPR	1 day	Mon 6/17/24	Mon 6/17/24																												
28	May 2024 MPR	1 day	Mon 7/15/24	Mon 7/15/24																												
29	June 2024 MPR	1 day	Thu 8/15/24	Thu 8/15/24																												
30	July 2024 MPR	1 day	Mon 9/16/24	Mon 9/16/24																												
31	August 2024 MPR	1 day	Tue 10/15/24	Tue 10/15/24																												
32	September 2024 MPR	1 day	Fri 11/15/24	Fri 11/15/24																												
33	October 2024 MPR	1 day	Mon 12/16/24	Mon 12/16/24																												
34	November 2024 MPR	1 day	Wed 1/15/25	Wed 1/15/25																												
35	Datagaps Workplan	175 days	Mon 4/1/24	Fri 11/29/24																												
36	Data Gaps Investigations	87 days	Mon 12/2/24	Tue 4/1/25																												
37	IRAM 1- Acid Plant Area Soil & GW ISS *	699 days	Mon 4/1/24	Thu 12/3/26																												
38	PDI Workplan Submittal	35 days	Mon 4/1/24	Fri 5/17/24																												
39	ODEQ Review	10 days	Thu 5/23/24	Wed 6/5/24																												
40	PDI Workplan Revisions	23 days	Wed 6/5/24	Fri 7/5/24																												
41	PDI Field Effort - Site Prep	15 days	Mon 6/17/24	Fri 7/5/24																												
42	PDI Field Effort - Phase I	40 days	Mon 7/8/24	Fri 8/30/24																												
43	Treatability Study Testing	122 days	Mon 9/2/24	Tue 2/18/25																												
44	PDI Field Effort - Phase II	24 days	Mon 9/30/24	Thu 10/31/24																												
45	PDI Report	70 days	Mon 9/2/24	Fri 12/6/24																												
46	Pre-final Design Report	59 days	Tue 12/10/24	Fri 2/28/25																												
47	ODEQ Review	20 days	Mon 3/3/25	Fri 3/28/25																												
48	Final Design Report	21 days	Mon 3/31/25	Mon 4/28/25																												
49	IRAM 1 Implementation (Summer/Fall 2025)	132 days	Mon 6/2/25	Tue 12/2/25																												
50	IRAM 1 Performance Monitoring	262 days	Wed 12/3/25	Thu 12/3/26																												
51	IRAM 2-Enhanced ISCR Perchlorate & CrVI In Chlorate Plant Area, if needed (Summer 2026 implementation)	261 days	Mon 9/15/25	Mon 9/14/26																												
52	IRAM 3-Remove Human Health Direct Contact Hot Spots, if needed (Summer 2028 implementation)	261 days	Mon 9/13/27	Mon 9/11/28																												
53	IRAM 4-Enhanced ISCR of Acid Plant Vicinity, if needed (Summer 2027 implementation)	207 days	Fri 12/4/26	Mon 9/20/27																												

Arkema Portland
Monthly Progress Report
Attachment C

Task

Split

Milestone

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Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

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Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

◆

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Manual Progress

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