Mr. Vance Atkins, LHG
Department of Ecology
Northwest Regional Office
15700 Dayton Ave N
Shoreline, WA 98133

Arcadis U.S., Inc.
4300 W Cypress Street
Suite 450
Tampa
Florida 33607
Tel 206 853 7428
www.arcadis.com

Subject:
2024 Request for Modifications to the Groundwater Monitoring Plan
Former Chevron Bulk Plant No. 100-1327
1602 North Northlake Place
Seattle, Washington
CSID: 1275, FSID: 2217

ENVIRONMENT

Date:
August 19, 2024

Contact:
Samuel Miles

Phone:
206 853 7428

Email:
Samuel.Miles@arcadis.com

Our ref:
30078450

Dear Mr. Atkins,

On behalf of Chevron Environmental Management Company (CEMC) and King County Metro Transit Department (King County or Metro), Arcadis U.S., Inc. (Arcadis) has prepared this 2024 Request for Modifications to the Groundwater Monitoring Plan (Plan) proposing modifications to the groundwater monitoring program (GMP) at the former Chevron Bulk Plant No. 100-1327 (the site) located at Facilities North / King County (Metro) in Seattle, Washington (Figures 1 and 2). Monitoring results support the following changes to the current monitoring plan:

- Reduction of the gauging, sampling, and reporting frequency.
- Reduction of the number of wells monitored per event.
- Modification of the analytical suite monitored in each monitoring well.
- Reduction of the frequency of progress reports.

This request outlines the proposed changes to the monitoring program as well as a modification of the arsenic cleanup level (CUL) so it is consistent with the CUL for the adjacent Gas Works Park site.

Site Description

The site is located at 1602 North Northlake Way along the north shore of Lake Union in a mixed-use residential and commercial neighborhood with industrial marine facilities located along the shoreline. This site is divided into two operable areas. The North Yard is located on the north side of North Northlake Way. The South Yard is located adjacent to the north shore of Lake Union and south of

North Northlake Way (Figures 1 and 2). The site began operations as a bulk petroleum fueling terminal in 1925. Former site features at the North Yard include above ground storage tanks, product piping, loading racks, and various small buildings. Product piping extended from the North Yard, across the public right of way, and into the South Yard. Former site features at the South Yard include a warehouse, two docks, a former railroad spur, and product piping.

Metro purchased the site in 1982 and used it for diesel fueling operations until 1992. In 1998, King County and Chevron Products Company, a division of Chevron U.S.A. Inc. (Chevron), entered into the Metro Lake Union/former Chevron Bulk Terminal Site Consent Decree (CD) to address soil and groundwater contamination (Ecology v. King County and Chevron 1998). Touchstone NLU LLC Corporation (Touchstone) purchased the property associated with the North Yard from KCDOT in 2009 and has since redeveloped that property.

In 2007, Touchstone entered into a Prospective Purchaser Consent Decree (PPCD) with the Washington State Department of Ecology (Ecology) that required Touchstone to remediate the North Yard to Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted use. Touchstone has completed remediation of the North Yard portion of the site as part of its redevelopment, called North Edge. According to the terms of the PPCD, Touchstone excavated and removed petroleum-contaminated soil within the Touchstone property line for treatment and/or offsite disposal. In 2016, Touchstone was given a no further action determination for soils within the North Yard. Soil outside the North Yard and groundwater throughout the North and South Yard are part of the Metro Lake Union/former Chevron Bulk Terminal Site CD.

As part of the CD, routine groundwater monitoring has occurred at the site since 1999. Initially, the site was monitored quarterly but Ecology approved a reduction in the groundwater monitoring scope so that currently, the site is monitored twice a year. The CD specifies that five consecutive quarters of concentrations below site CULs must be demonstrated within compliance wells to demonstrate MTCA compliance.

Current Groundwater Monitoring Program

There are 20 monitoring wells at the site; 12 wells (MW-9R, MW-11, MW-4, MW-15, MW-19, MW-20, MW-21, MW-22, MW-24, MW-29, MW-30, and EW-1) are associated with the North Yard and eight wells (MW-4, MW-7, MW-8A, MW-25, MW-26, AGI-2, MLU-1, and MLU-3) are associated with the South Yard (Figure 3). The current GMP includes semi-annual gauging of 20 wells and semiannual sampling of 11 compliance wells (MW-4, MW-7, MW-8A, MW-19, MW-20, MW-21, MW-25, MW-26, AGI-2, MLU-1, and MLU-3). Compliance wells are currently sampled for the following constituents of concern (COCs):

- Petroleum constituents: benzene, toluene, ethylbenzene, and naphthalene.
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs): benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene).
- Dissolved lead and dissolved arsenic.

Groundwater elevation contour and analytical results maps from the November 2023 sampling event are shown on Figures 4 through 7.

Rationale for Reduced Sampling Frequency for the Groundwater Monitoring Program

Arcadis performed a qualitative evaluation to identify appropriate modifications to the sampling program as presented in this Plan. The qualitative evaluation considers the need to collect long-term gauging data to assess groundwater elevations and hydraulic gradient trends. Arcadis evaluated current and historical groundwater analytical results to determine whether particular COCs could be removed from the sampling program and whether a reduction in frequency at specific wells will adequately track the remaining COC concentration trends. A summary of this evaluation is provided in Table 1 and discussed in more detail below.

Groundwater currently complies with applicable CULs for all COCs except for arsenic. As of the most recent sampling event in November 2023, dissolved arsenic was detected at a concentration greater than the laboratory reporting limit in wells MW-7, MW-20, and MW-21, AGI-2 and was detected above the laboratory method detection limit but below the laboratory reporting limit in wells MW-4, MW-8A, MLU-1, MLU-3, MW-19, MW-25, and MW-26. The detected arsenic concentrations were less than the Ecology identified background value of 8 µg/L for the Puget Sound Basin (Ecology 2022), with the exception of the concentrations detected in AGI-2 and MW-21.

The 1998 CD specifies that five consecutive quarters of concentrations below site CULs must be demonstrated within compliance wells to demonstrate MTCA compliance. As of the most recent sampling event, 10 of the 11 compliance wells have been in compliance with the site CULs for benzene, toluene, ethylbenzene, and naphthalene for at least 16 consecutive groundwater monitoring events. All 11 compliance wells have been in compliance with the site CULs for cPAHs for at least 16 consecutive groundwater monitoring events. Nine of the 11 compliance wells have been in compliance with the site CULs for lead for at least 21 consecutive groundwater monitoring events. Eight of the 11 compliance wells have contained dissolved arsenic at concentrations less than the Ecology identified background value of 8 µg/L for the Puget Sound Basin (Ecology 2022) for eight or more consecutive groundwater monitoring events. The proposed change to the arsenic cleanup level to 8 ug/L is discussed below.

Proposed Modifications to Groundwater Monitoring Program

Arcadis proposes to reduce the groundwater gauging frequency from semiannual to annual because monitoring has continued for 35 years and concentrations in compliance wells are stable or declining.

Arcadis further proposes to reduce the number of compliance wells to be sampled and the analytes to be sampled in the remaining wells as presented in Table 2. Arcadis proposes to monitor the following wells annually:

- MW-7 and MW-21 sampled for dissolved arsenic.
- AGI-2 sampled for petroleum constituents, dissolved lead, and dissolved arsenic.
- MLU-3 sampled for dissolved lead.

Arcadis proposes to discontinue sampling at compliance wells MW-4, MW-8A, MW-19, MW-20, MW-25, MW-26, and MLU-1. Groundwater analytical results in these wells have been compliant with CULs for more than five consecutive sampling events so additional sampling is not warranted as specified in the 1998 CD. MW-7, MW-21, AGI-2 and MLU-3 will serve as the conditional points of compliance at the site.

Proposed Modification to Groundwater Cleanup Levels

The 0.0982 µg/L arsenic CUL specified in the CD is orders of magnitude lower than current arsenic standards developed for drinking water by the MTCA and United States Environmental Protection Agency (USEPA). The current MTCA Method A groundwater CUL is 5 µg/L (Washington Administrative Code 173-340-900, Table 720-1) and the current USEPA federal drinking water maximum contaminate level is 10 µg/L (USEPA 2009), which are both based on background concentrations found naturally in groundwater. Background groundwater concentrations of arsenic in Washington were evaluated by Ecology in 2022 and the background threshold value was established of 8 µg/L for the Puget Sound Basin (Ecology 2022). Additionally, the current arsenic CUL is orders of magnitude below the USEPA Method 6020 practical quantitation limit for arsenic of 2 µg/ and the USEPA Method 6020 method detection limit for arsenic (ranging from 0.18 to 0.95 µg/L). Therefore, it is not possible to quantify arsenic below the current CUL established in the CD.

Arcadis proposes to increase the arsenic CUL to the background concentration established for the Puget Sound Basin of 8 µg/L. This is the CUL in effect at the adjacent Gas Works Park site (Ecology v. Puget Sound Energy, Inc. and the City of Seattle 2024) and is expected to be the MTCA cleanup level in the future.

Proposed Modification in Reporting

Following approval of the proposed GMP, Arcadis proposes to reduce the groundwater monitoring reporting frequency from semiannual to annual.

Conclusion

In conclusion, Arcadis proposes the following changes for the site:

- Reduction in groundwater gauging, sampling, and reporting frequency from semiannual to annual.
- Reduction of groundwater sampling scope for wells MW-7, MW-21, AGI-2, and MLU-3.
- Removal of wells MW-4, MW-8A, MW-19, MW-20, MW-25, MW-26, and MLU-1 from the groundwater sampling scope.
- Increase the dissolved arsenic CUL established in the CD from 0.0982 µg/L to the background concentration established for the Puget Sound Basin of 8 µg/L.

Arcadis proposes to implement the modifications beginning in 2025. Please let us know if you concur with the proposed changes to the GMP plan. If you have any questions or comments regarding the content of this letter, please contact Samuel Miles at 206.853.7428 or at samuel.miles@arcadis.com.

Sincerely,

Arcadis U.S., Inc.

Samuel Miles
Project Manager

Enclosures:

Tables

1 Point of Compliance Evaluation

2 Proposed Groundwater Sampling Scope

Figures

1 Site Location Map
2 Site Aerial Map
3 Site Plan
4 Groundwater Elevation Contour Map – November 28, 2023
5 Groundwater Analytical Results Map – Petroleum Constituents – November 28, 2024
6 Groundwater Analytical Results Map – cPAHs – November 28, 2024
7 Groundwater Analytical Results Map – Dissolved Metals – November 28, 2024

Reference

Ecology v. Puget Sound Energy, Inc. and the City of Seattle. 2024. State of Washington, King County Superior Court No. 23-2-25643-3. Consent Decree. January 24.

Ecology. 2022. Natural Background Groundwater Arsenic Concentrations in Washington State Study Results. January.

Ecology v. King County and Chevron. 1998. State of Washington, King County Superior Court No. 99-2-0865511-1SEA. Consent Decree.

USEPA. 2009. National Primary Drinking Water Regulations. May.

Tables

Table 1. Point of Compliance Evaluation
Former Chevron Bulk Plant 100-1327
1602 North Northlake Way
Seattle, Washington

Monitoring Well	Current Sampling Interval	Petroleum Constituents: Benzene, Toluene, Ethylbenzene, Naphthalene		Carcinogenic Polycyclic Aromatic Hydrocarbons		Lead		Arsenic	
		Consecutive Sampling Events in Compliance[1]	Number of Events with Exceedances since 2010[1]	Consecutive Sampling Events in Compliance[1]	Number of Events with Exceedances since 2010[1]	Consecutive Sampling Events in Compliance[1]	Number of Events with Exceedances since 2010[1]	Consecutive Sampling Events in Compliance[1,2]	Number of Events with Exceedances since 2010[1,2]
North Yard									
MW-19	semi-annual	24	0	16	3 (most recently in 2Q16)	23	0	23	0
MW-20	semi-annual	25	0	28	0	24	0	29	1 (3Q12)
MW-21	semi-annual	26	0	25	1 (1Q10)	26	0	0	30 (most recentlly in 4Q23)
South Yard									
MW-4	semi-annual	27	0	21	3 (most recently in 2Q12)	27	0	8	1 (4Q18)
MW-7	semi-annual	16	3 (most recently in 4Q15)	16	3 (most recently in 4Q15)	21	0	4	8 (most recently in 1Q22)
MW-8A	semi-annual	26	0	25	1 (1Q10)	26	0	26	0
AGI-2	semi-annual	8	2 (most recently in 4Q19)	22	2 (most recently in 3Q10)	10	1 (4Q18 at 11.2 µg/L)	0	16 (most recently in 4Q23)
MLU-1	semi-annual	25	0	24	1 (1Q10)	25	0	25	0
MLU-3 [3]	semi-annual	18	0	18	0	4	1 (1Q22 at 5.45 J µg/L)	18	0
MW-25	semi-annual	26	0	26	0	26	0	26	0
MW-26	semi-annual	26	0	26	1 (1Q10)	26	0	26	0

Notes:

[1] "Consecutive events" are the number of consecutive sampling events prior to and including the current reporting period that are in compliance with the site groundwater Cleanup Levels (CULs). Events prior to 2010 are not counted. Refer to progress reports for analytical results.

[2] Arsenic considered in compliance when concentrations are less than the Ecology established background value of 8 µg/L for the Puget Sound Basin.

[3] MLU-3 only sampled 17 times since 2010. MLU-3 was sampled annually in 2014 and 2015 and semi-annually since.

Acronyms and Abbreviations:

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

USEPA = United States Environmental Protection Agency

Table 2. Proposed Groundwater Sampling Scope
Former Chevron Bulk Plant 100-1327
1602 North Northlake Way
Seattle, Washington

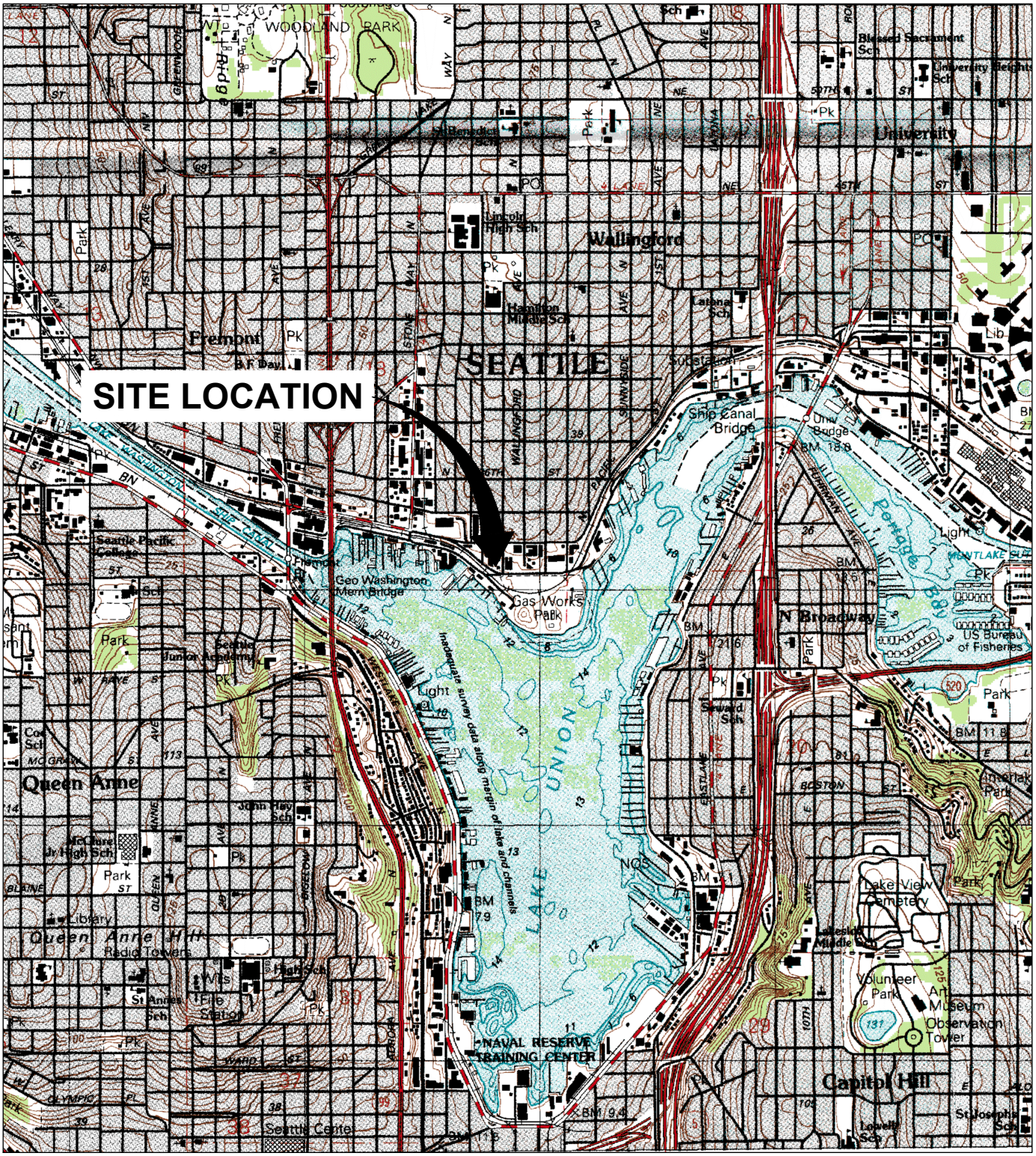
Well	Proposed Sampling Interval	Proposed Sampling Scope				Justification[2]
		Petroleum Constituents: Benzene, Toluene, Ethylbenzene, Naphthalene	cPAHs	Lead	Arsenic[1]	
North Yard						
MW-19	None, Remove from Scope	--	--	--	--	All constituents in compliance since at least 2016
MW-20	None, Remove from Scope	--	--	--	--	All constituents in compliance since at least 2012
MW-21	Annual	--	--	--	X	Petroleum Constituents, cPAHs, and Lead in compliance since 2010
South Yard						
MW-4	None, Remove from Scope	--	--	--	--	All constiuents in compliance since at least 2019
MW-7	Annual	--	--	--	X	Petroleum Constituents, cPAHs, and Lead in compliance since at least 2015
MW-8A	None, Remove from Scope	--	--	--	--	All constituents in compliance since at least 2010
AGI-2	Annual	X	--	X	X	cPAHs in compliance since 2010
MLU-1	None, Remove from Scope	--	--	--	--	All constituents in compliance since at least 2010
MLU-3	Annual	--	--	X	--	Petroleum Constituents, cPAHs, and Arsenic in compliance since 2010
MW-25	None, Remove from Scope	--	--	--	--	All constituents in compliance since at least 2010
MW-26	None, Remove from Scope	--	--	--	--	All constituents in compliance since at least 2010

Notes
1. Arsenic considered in compliance when concentrations are less than the Washington Department of Ecology (Ecology) established background value of 8 µg/L for the Puget Sound Basin (Ecology 2022).
2. Results from sampling events from 2010 to present were reviewed when determining proposed SOW.

Acronyms and Abbreviations:
-- = Sampling not proposed
cPAH = carcinogenic polyciclic aromatic hydrocarbon
X = Sampling proposed

Refernce:
Ecology. 2022. Natural Background Groundwater Arsenic Concentrations in Washington State Study Results. January.

Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., SEATTLE NORTH, WA.

0 2,000' 4,000'

Approximate Scale: 1 in. = 2,000 ft.

FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON

SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT

SITE LOCATION MAP

ARCADIS

FIGURE 1

N

LEGEND:

- PROPERTY BOUNDARY
- FORMER CHEVRON/METRO SITE CONSENT DECREE BOUNDARY
- NORTH YARD
- SOUTH YARD
- PUBLIC RIGHT OF WAY

0 100' 200'

GRAPHIC SCALE

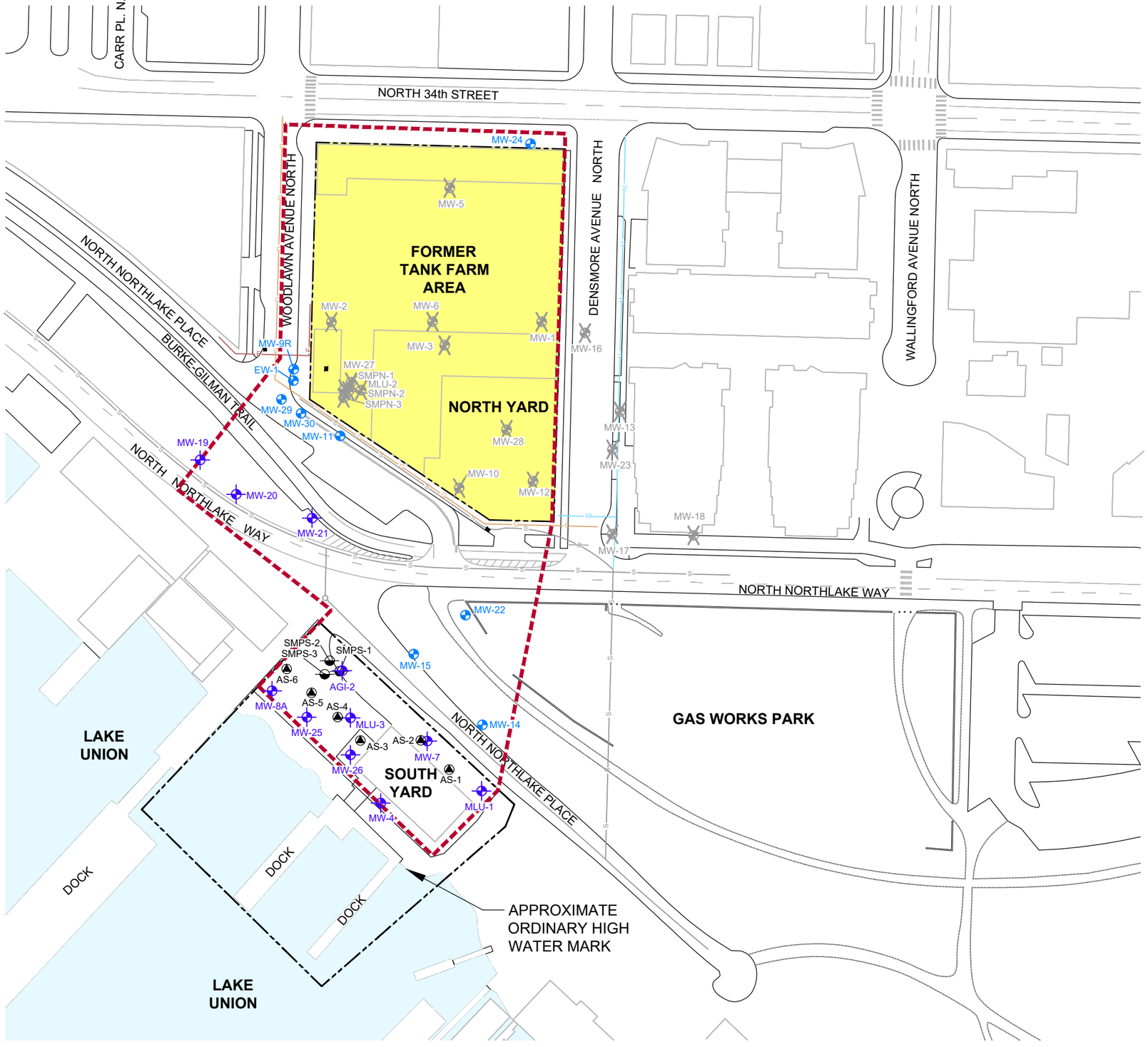
FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON

SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT

SITE AERIAL MAP

ARCADIS

FIGURE 2



LEGEND:

- PROPERTY BOUNDARY
- FORMER CHEVRON/METRO SITE CONSENT DECREE BOUNDARY
- COMPLIANCE MONITORING WELL
- GROUNDWATER MONITORING WELL
- SUPPLEMENTARY MONITORING POINT
- BIOSPARGE INJECTION WELL
- ABANDONED MONITORING WELL
- CATCH BASIN
- NATURAL GAS LINE (APPROXIMATE)
- UNDERGROUND ELECTRIC LINE (APPROXIMATE)
- WATER LINE (APPROXIMATE)
- SEWER LINE (APPROXIMATE)
- TOUCHSTONE REDEVELOPMENT EXCAVATION BOUNDARY

NOTES:

1. BASE MAP FROM A DRAWING BY SAIC TITLED "SITE MAP", DATED 09-14-07, @ A SCALE OF 1" = 60'. REVISED IN ACCORDANCE WITH A SURVEY DRAWING BY OTAK CONDUCTED IN APRIL & MAY, 2011, OCTOBER 2014, AND DECEMBER 2016.
2. METRO LAKE UNION UPLAND SITE BOUNDARY APPROXIMATED BASED ON DIGITIZING 1998 CONSENT DECREE BOUNDARY.
3. THE ORDINARY HIGH WATER MARK IS THE BOUNDARY BETWEEN THE SOUTH YARD UPLANDS AND SEDIMENTS. IT IS APPROXIMATED ON THIS FIGURE BASED ON THE BASE MAP/AERIAL.
4. THE FORMER NORTH YARD WAS ENTIRELY EXCAVATED IN 2014/2015. FORMER BUILDINGS ARE GREYED OUT.
5. ALL LOCATIONS OTHER THAN CURRENT GROUNDWATER MONITORING WELLS AND COMPLIANCE MONITORING WELLS ARE APPROXIMATE

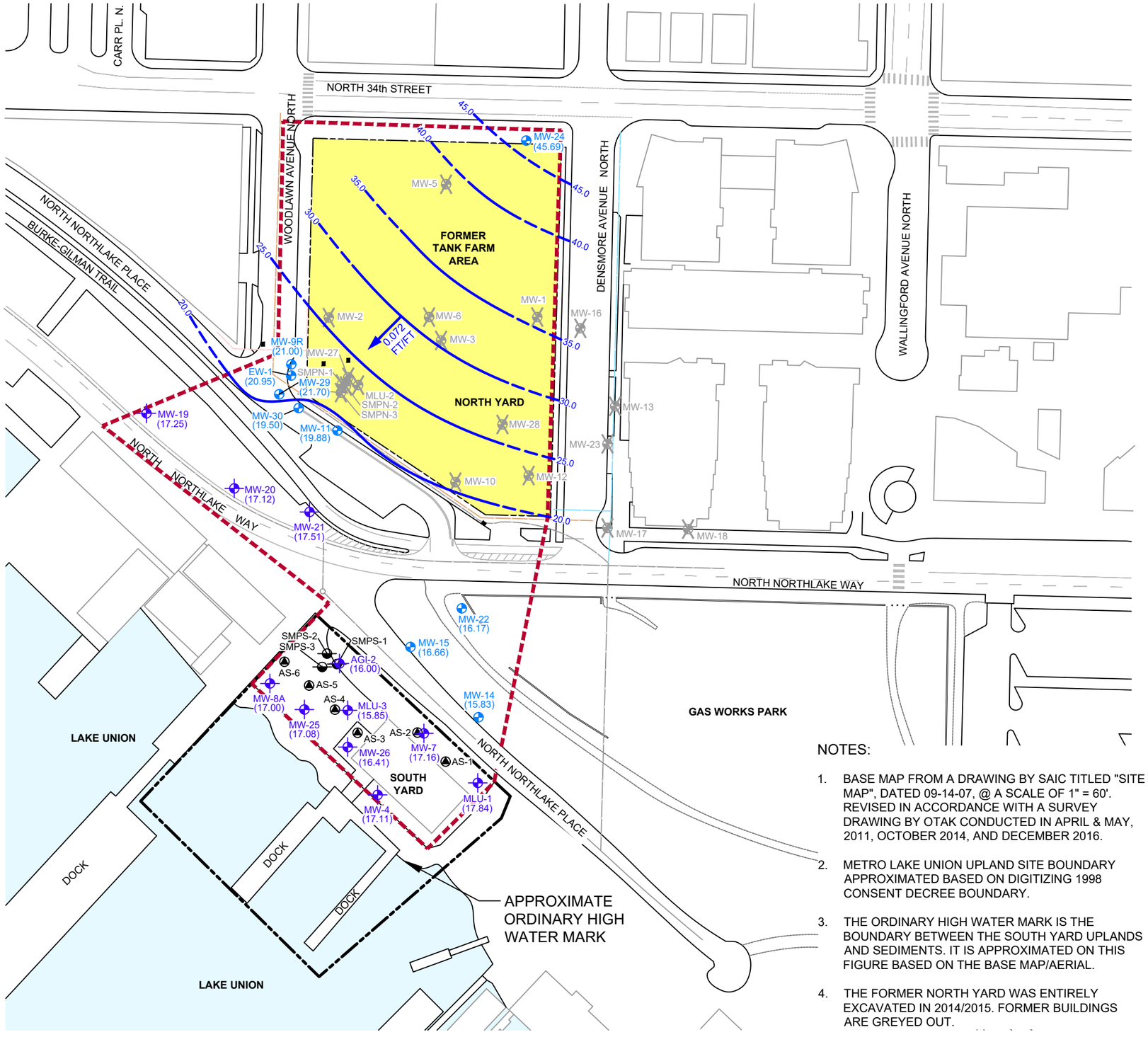
0 100' 200'
GRAPHIC SCALE

FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON
SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT

SITE PLAN

ARCADIS

FIGURE
3



LEGEND:

- PROPERTY BOUNDARY
- FORMER CHEVRON/METRO SITE CONSENT DECREE BOUNDARY
- COMPLIANCE MONITORING WELL
- GROUNDWATER MONITORING WELL
- SUPPLEMENTARY MONITORING POINT
- BIOSPARGE INJECTION WELL
- ABANDONED MONITORING WELL
- CATCH BASIN
- G — NATURAL GAS LINE (APPROX.)
- E — UNDERGROUND ELECTRIC LINE (APPROX.)
- W — WATER LINE (APPROX.)
- S — SEWER LINE (APPROX.)
- TOUCHSTONE REDEVELOPMENT EXCAVATION BOUNDARY
- 45.0 — GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- (45.69) GROUNDWATER ELEVATION IN FEET ABOVE NAVD 88
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- 0.072 FT/FT APPROXIMATE HYDRAULIC GRADIENT (FEET/FOOT)

N

NOTES:

1. BASE MAP FROM A DRAWING BY SAIC TITLED "SITE MAP", DATED 09-14-07, @ A SCALE OF 1" = 60'. REVISED IN ACCORDANCE WITH A SURVEY DRAWING BY OTAK CONDUCTED IN APRIL & MAY, 2011, OCTOBER 2014, AND DECEMBER 2016.
2. METRO LAKE UNION UPLAND SITE BOUNDARY APPROXIMATED BASED ON DIGITIZING 1998 CONSENT DECREE BOUNDARY.
3. THE ORDINARY HIGH WATER MARK IS THE BOUNDARY BETWEEN THE SOUTH YARD UPLANDS AND SEDIMENTS. IT IS APPROXIMATED ON THIS FIGURE BASED ON THE BASE MAP/AERIAL.
4. THE FORMER NORTH YARD WAS ENTIRELY EXCAVATED IN 2014/2015. FORMER BUILDINGS ARE GREYED OUT.

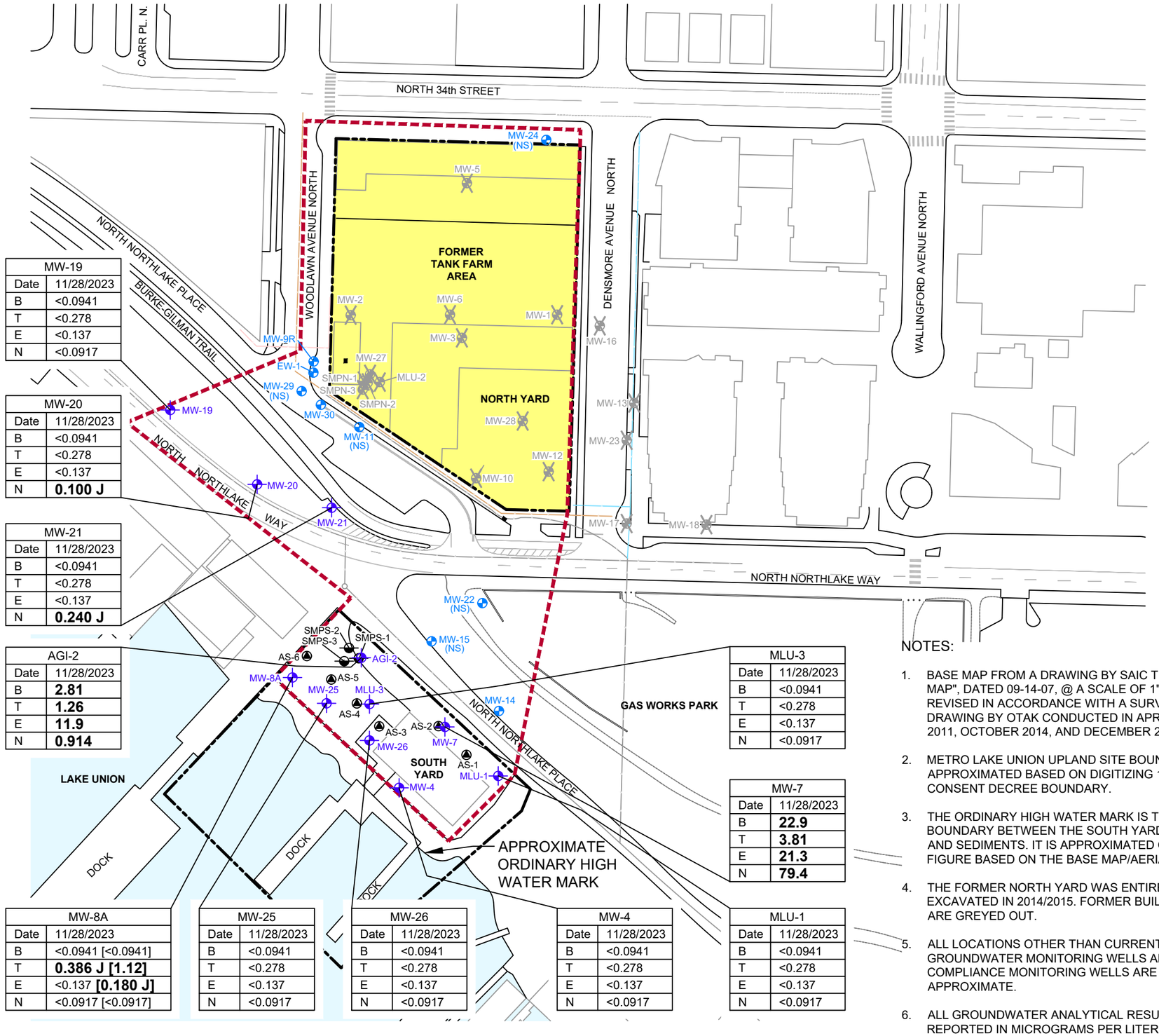
0 100' 200'
GRAPHIC SCALE

FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON
SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT 2023

GROUNDWATER ELEVATION CONTOUR MAP NOVEMBER 28, 2023

ARCADIS

FIGURE 4



MW-19	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	<0.0917

MW-20	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	**0.100 J**

MW-21	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	**0.240 J**

AGI-2	
Date	11/28/2023
B	**2.81**
T	**1.26**
E	**11.9**
N	**0.914**

MW-8A	
Date	11/28/2023
B	<0.0941 [<0.0941]
T	**0.386 J [1.12]**
E	<0.137 **[0.180 J]**
N	<0.0917 [<0.0917]

MW-25	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	<0.0917

MW-26	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	<0.0917

MW-4	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	<0.0917

MLU-1	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	<0.0917

MLU-3	
Date	11/28/2023
B	<0.0941
T	<0.278
E	<0.137
N	<0.0917

MW-7	
Date	11/28/2023
B	**22.9**
T	**3.81**
E	**21.3**
N	**79.4**

LEGEND:

- PROPERTY BOUNDARY
- FORMER CHEVRON/METRO SITE CONSENT DECREE BOUNDARY
- COMPLIANCE MONITORING WELL
- GROUNDWATER MONITORING WELL
- SUPPLEMENTARY MONITORING POINT
- BIOSPARGE INJECTION WELL
- ABANDONED MONITORING WELL
- CATCH BASIN
- NATURAL GAS LINE (APPROX.)
- UNDERGROUND ELECTRIC LINE (APPROX.)
- WATER LINE (APPROX.)
- SEWER LINE (APPROX.)
- TOUCHSTONE REDEVELOPMENT EXCAVATION BOUNDARY
- **BOLD** DETECT VALUES GREATER THAN THE REPORTING LIMIT MDL
- < INDICATES CONCENTRATION IS LESS THAN THE METHOD DETECTION LIMIT (MDL).
- J RESULT IS LESS THAN THE RDL BUT GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT AND THE CONCENTRATION IS AN APPROXIMATE VALUE
- [ ] DUPLICATE SAMPLE RESULTS
- (NS) NOT SAMPLED

NOTES:

1. BASE MAP FROM A DRAWING BY SAIC TITLED "SITE MAP", DATED 09-14-07, @ A SCALE OF 1" = 60'. REVISED IN ACCORDANCE WITH A SURVEY DRAWING BY OTAK CONDUCTED IN APRIL & MAY, 2011, OCTOBER 2014, AND DECEMBER 2016.
2. METRO LAKE UNION UPLAND SITE BOUNDARY APPROXIMATED BASED ON DIGITIZING 1998 CONSENT DECREE BOUNDARY.
3. THE ORDINARY HIGH WATER MARK IS THE BOUNDARY BETWEEN THE SOUTH YARD UPLANDS AND SEDIMENTS. IT IS APPROXIMATED ON THIS FIGURE BASED ON THE BASE MAP/AERIAL.
4. THE FORMER NORTH YARD WAS ENTIRELY EXCAVATED IN 2014/2015. FORMER BUILDINGS ARE GREYED OUT.
5. ALL LOCATIONS OTHER THAN CURRENT GROUNDWATER MONITORING WELLS AND COMPLIANCE MONITORING WELLS ARE APPROXIMATE.
6. ALL GROUNDWATER ANALYTICAL RESULTS ARE REPORTED IN MICROGRAMS PER LITER (µg/L)

Site Cleanup Levels		
B	Benzene	43
T	Toluene	48,500
E	Ethylbenzene	6,910
N	Naphthalene	9,880

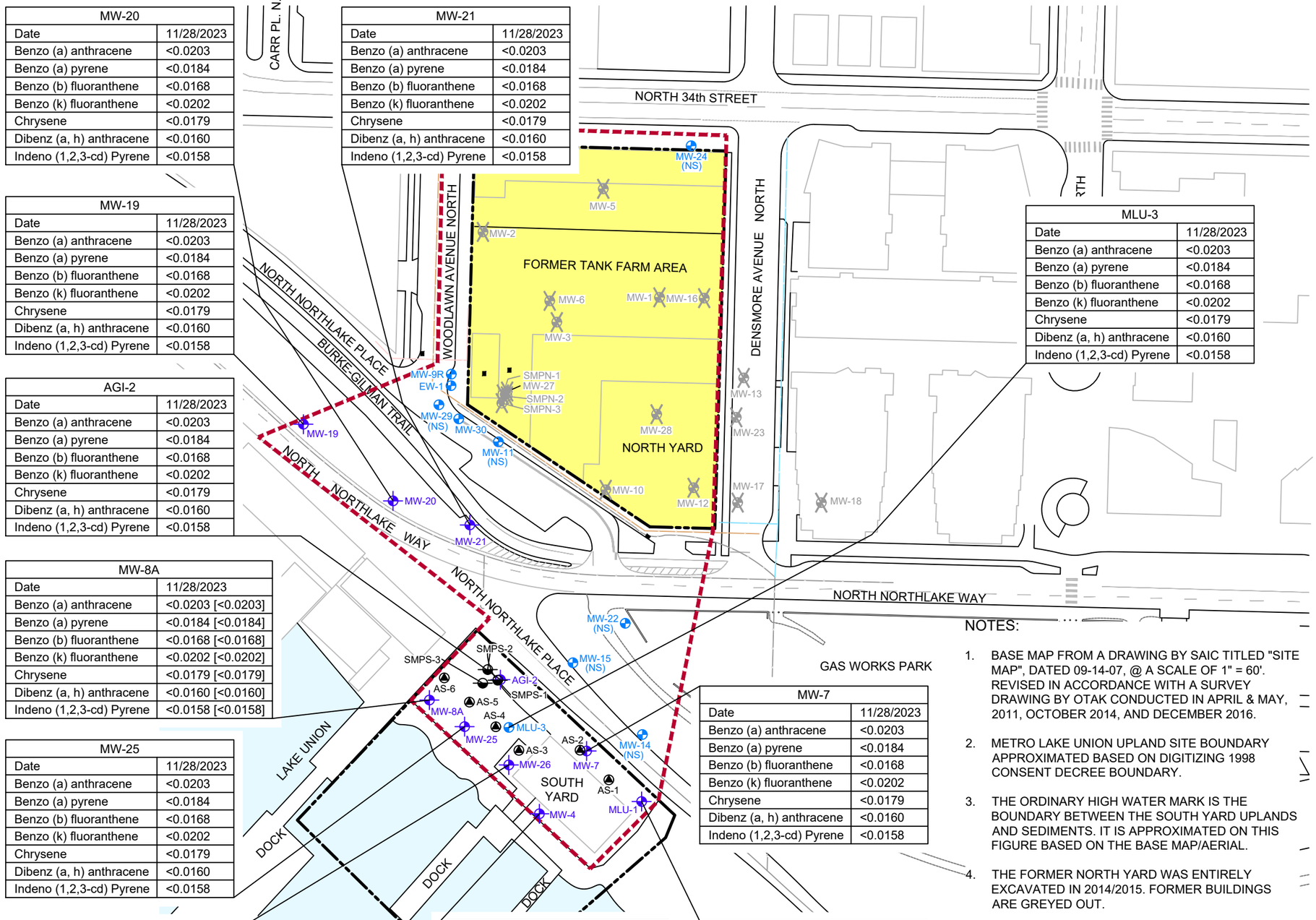
0 100' 200'
GRAPHIC SCALE

FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON
SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT 2023

GROUNDWATER ANALYTICAL RESULT MAP - PETROLEUM CONSTITUENTS NOVEMBER 28, 2023

ARCADIS

FIGURE 5



MW-20	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MW-21	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MW-19	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MLU-3	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

AGI-2	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MW-8A	
Date	11/28/2023
Benzo (a) anthracene	<0.0203 [<0.0203]
Benzo (a) pyrene	<0.0184 [<0.0184]
Benzo (b) fluoranthene	<0.0168 [<0.0168]
Benzo (k) fluoranthene	<0.0202 [<0.0202]
Chrysene	<0.0179 [<0.0179]
Dibenz (a, h) anthracene	<0.0160 [<0.0160]
Indeno (1,2,3-cd) Pyrene	<0.0158 [<0.0158]

MW-25	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MW-26	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MW-4	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MW-7	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

MLU-1	
Date	11/28/2023
Benzo (a) anthracene	<0.0203
Benzo (a) pyrene	<0.0184
Benzo (b) fluoranthene	<0.0168
Benzo (k) fluoranthene	<0.0202
Chrysene	<0.0179
Dibenz (a, h) anthracene	<0.0160
Indeno (1,2,3-cd) Pyrene	<0.0158

LEGEND:

- PROPERTY BOUNDARY
- FORMER CHEVRON/METRO SITE CONSENT DECREE BOUNDARY
- GROUNDWATER MONITORING WELL
- ABANDONED MONITORING WELL
- COMPLIANCE MONITORING WELL
- SUPPLEMENTARY MONITORING POINT
- BIOSPARGE INJECTION WELL
- CATCH BASIN
- NATURAL GAS LINE (APPROX.)
- UNDERGROUND ELECTRIC LINE (APPROX.)
- WATER LINE (APPROX.)
- SEWER LINE (APPROX.)
- TOUCHSTONE REDEVELOPMENT EXCAVATION BOUNDARY
- < INDICATES CONCENTRATION IS LESS THAN THE METHOD DETECTION LIMIT (MDL).
- [ ] DUPLICATE SAMPLE (µg/L)
- (NS) NOT SAMPLED

N

NOTES:

1. BASE MAP FROM A DRAWING BY SAIC TITLED "SITE MAP", DATED 09-14-07, @ A SCALE OF 1" = 60'. REVISED IN ACCORDANCE WITH A SURVEY DRAWING BY OTAK CONDUCTED IN APRIL & MAY, 2011, OCTOBER 2014, AND DECEMBER 2016.
2. METRO LAKE UNION UPLAND SITE BOUNDARY APPROXIMATED BASED ON DIGITIZING 1998 CONSENT DECREE BOUNDARY.
3. THE ORDINARY HIGH WATER MARK IS THE BOUNDARY BETWEEN THE SOUTH YARD UPLANDS AND SEDIMENTS. IT IS APPROXIMATED ON THIS FIGURE BASED ON THE BASE MAP/AERIAL.
4. THE FORMER NORTH YARD WAS ENTIRELY EXCAVATED IN 2014/2015. FORMER BUILDINGS ARE GREYED OUT.
5. ALL LOCATIONS OTHER THAN CURRENT GROUNDWATER MONITORING WELLS AND COMPLIANCE MONITORING WELLS ARE APPROXIMATE.
6. ARSENIC AND LEAD SAMPLES WERE FIELD FILTERED WITH A DISPOSABLE 0.45 MICRON FILTER.
7. ALL GROUNDWATER ANALYTICAL RESULTS ARE REPORTED IN MICROGRAMS PER LITER (µg/L)

Site Cleanup Levels	
Benzo (a) anthracene	0.0296
Benzo (a) pyrene	0.0296
Benzo (b) fluoranthene	0.0296
Benzo (k) fluoranthene	0.0296
Chrysene	0.0296
Dibenz (a,h) anthracene	0.0296
Indeno (1,2,3-cd) Pyrene	0.0296

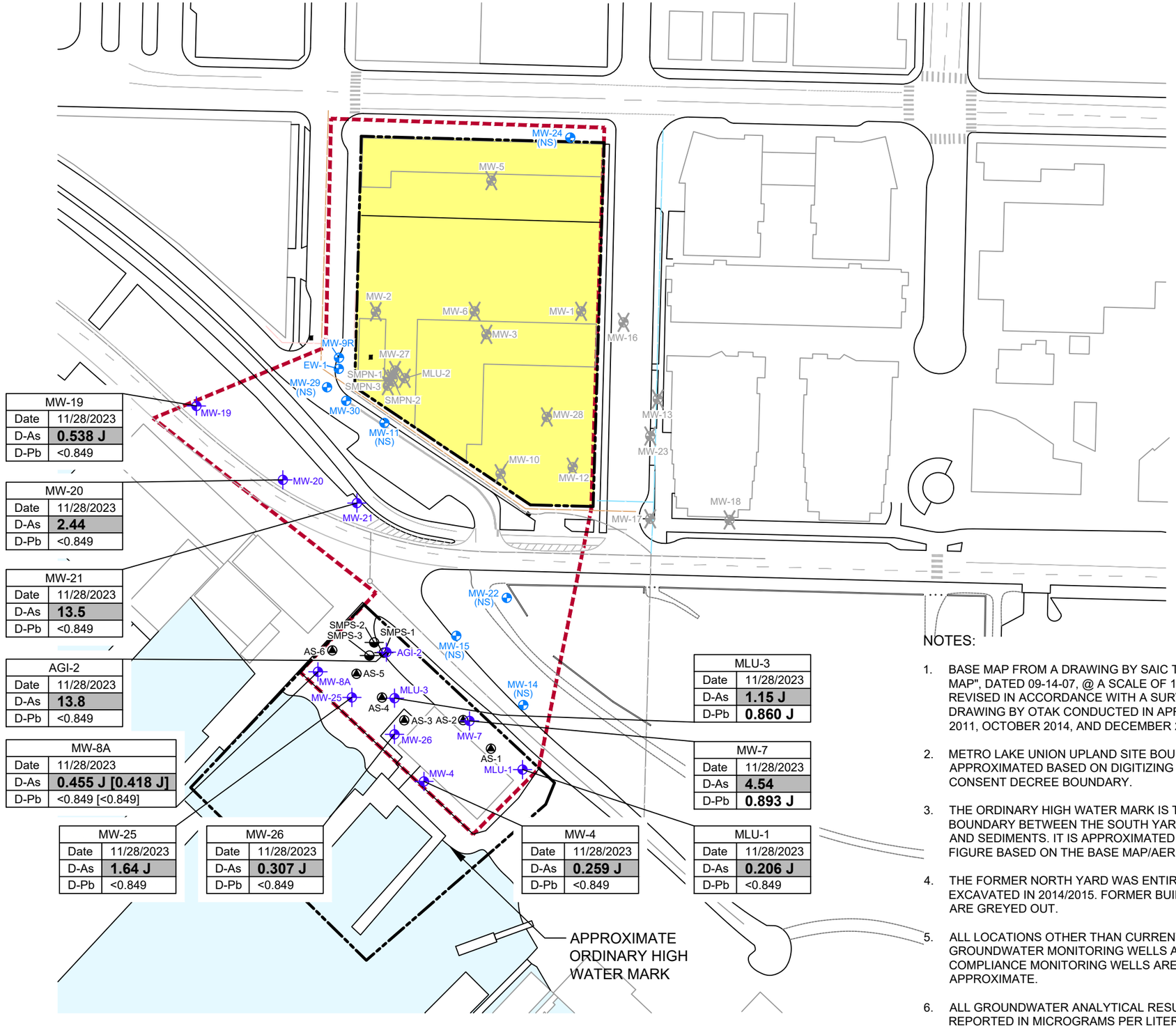
0 100' 200'
GRAPHIC SCALE

FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON
SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT 2023

GROUNDWATER ANALYTICAL RESULT MAP - cPAHs NOVEMBER 28, 2023

ARCADIS

FIGURE 6



MW-19	
Date	11/28/2023
D-As	**0.538 J**
D-Pb	<0.849

MW-20	
Date	11/28/2023
D-As	**2.44**
D-Pb	<0.849

MW-21	
Date	11/28/2023
D-As	**13.5**
D-Pb	<0.849

AGI-2	
Date	11/28/2023
D-As	**13.8**
D-Pb	<0.849

MW-8A	
Date	11/28/2023
D-As	**0.455 J [0.418 J]**
D-Pb	<0.849 [<0.849]

MW-25	
Date	11/28/2023
D-As	**1.64 J**
D-Pb	<0.849

MW-26	
Date	11/28/2023
D-As	**0.307 J**
D-Pb	<0.849

MW-4	
Date	11/28/2023
D-As	**0.259 J**
D-Pb	<0.849

MLU-3	
Date	11/28/2023
D-As	**1.15 J**
D-Pb	**0.860 J**

MW-7	
Date	11/28/2023
D-As	**4.54**
D-Pb	**0.893 J**

MLU-1	
Date	11/28/2023
D-As	**0.206 J**
D-Pb	<0.849

LEGEND:

- PROPERTY BOUNDARY
- FORMER CHEVRON/METRO SITE CONSENT DECREE BOUNDARY
- COMPLIANCE MONITORING WELL
- GROUNDWATER MONITORING WELL
- SUPPLEMENTARY MONITORING POINT
- BIOSPARGE INJECTION WELL
- ABANDONED MONITORING WELL
- CATCH BASIN
- NATURAL GAS LINE (APPROX.)
- UNDERGROUND ELECTRIC LINE (APPROX.)
- WATER LINE (APPROX.)
- SEWER LINE (APPROX.)
- TOUCHSTONE REDEVELOPMENT EXCAVATION BOUNDARY
- **BOLD** CONCENTRATIONS ARE GREATER THAN THEIR RESPECTIVE SITE CLEANUP LEVELS
- **BOLD** DETECT VALUES GREATER THAN THE REPORTING LIMIT MDL
- < INDICATES CONCENTRATION IS LESS THAN THE METHOD DETECTION LIMIT (MDL)
- J RESULT IS LESS THAN THE RDL BUT GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT AND THE CONCENTRATION IS AN APPROXIMATE VALUE
- [ ] DUPLICATE SAMPLE RESULTS
- (NS) NOT SAMPLED

N

NOTES:

1. BASE MAP FROM A DRAWING BY SAIC TITLED "SITE MAP", DATED 09-14-07, @ A SCALE OF 1" = 60'. REVISED IN ACCORDANCE WITH A SURVEY DRAWING BY OTAK CONDUCTED IN APRIL & MAY, 2011, OCTOBER 2014, AND DECEMBER 2016.
2. METRO LAKE UNION UPLAND SITE BOUNDARY APPROXIMATED BASED ON DIGITIZING 1998 CONSENT DECREE BOUNDARY.
3. THE ORDINARY HIGH WATER MARK IS THE BOUNDARY BETWEEN THE SOUTH YARD UPLANDS AND SEDIMENTS. IT IS APPROXIMATED ON THIS FIGURE BASED ON THE BASE MAP/AERIAL.
4. THE FORMER NORTH YARD WAS ENTIRELY EXCAVATED IN 2014/2015. FORMER BUILDINGS ARE GREYED OUT.
5. ALL LOCATIONS OTHER THAN CURRENT GROUNDWATER MONITORING WELLS AND COMPLIANCE MONITORING WELLS ARE APPROXIMATE.
6. ALL GROUNDWATER ANALYTICAL RESULTS ARE REPORTED IN MICROGRAMS PER LITER (µg/L)

Site Cleanup Levels		
D-As	Dissolved Arsenic	0.0982
D-Pb	Dissolved Lead	5

0 100' 200'
GRAPHIC SCALE

FORMER CHEVRON BULK PLANT No. 100-1327
FACILITIES NORTH / KING COUNTY (METRO)
SEATTLE, WASHINGTON
SECOND SEMI-ANNUAL GROUNDWATER MONITORING REPORT 2023

GROUNDWATER ANALYTICAL RESULTS MAP - DISSOLVED METALS NOVEMBER 28, 2023

ARCADIS

FIGURE 7