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Memorandum

To: Tena Seeds, Washington State Department of Ecology

Copies: Mike Ciserella, Doug Ciserella, and Kim Hempel, TOC Seattle Terminal 1, LLC

From: Lynn Grochala and Kristin Anderson, Floyd|Snider

Date: October 1, 2024

Project ID: Cantera-TOC

Re: **ASKO and BNSF Property Line Data Summary**

This memorandum provides a summary of available soil and groundwater data from investigations completed near the property line between the ASKO Hydraulic (ASKO) and BNSF Railway Company (BNSF) parcel properties of the Time Oil Bulk Terminal Site (Site). Additional soil and groundwater data were recently collected by BNSF as part of a remedial investigation (RI) on the BNSF parcel. These additional data, in combination with previously collected data on the ASKO parcel, provide an updated understanding of the conceptual site model (CSM) for the property line area, including the distribution of contaminant releases and migration pathways, which are described in the following sections. The key finding of this updated understanding of the CSM is that groundwater contaminated with trichloroethene (TCE) continues to migrate from the BNSF parcel to the ASKO parcel at concentrations exceeding the Site cleanup level. Immediate action by BNSF is necessary to address the flow of TCE-contaminated groundwater onto the ASKO parcel where a cleanup action has already been implemented.

BACKGROUND

Time Oil operated at the Site from 1941 until mid-2016. Four rail spurs entered the southern portion of the ASKO parcel from the BNSF railroad, with a fifth located next to the main line for extra storage of rail tanker cars. The rail spurs were constructed by the mid-1940s and were removed by 1985 (SES 2014). The locations of the ASKO and BNSF parcels are shown on Figure 1 (adapted from the 2023 Groundwater Monitoring Annual Report for the Site).

TCE was discovered in soil and groundwater on the BNSF and ASKO parcels during RI activities conducted by Time Oil between 2000 and 2016. The BNSF parcel, just south of the ASKO parcel, contained the shallowest impacts and the greatest TCE concentrations in perched groundwater (7,800 micrograms per liter [µg/L] at well 01MW92 in 2014; Floyd|Snider 2020). Based on these findings, the primary source of TCE on the ASKO parcel was concluded to be releases during railway operations on BNSF. Data collected during the RI activities found that TCE was present in soil and perched groundwater (the perched water bearing zone [WBZ]) on the BNSF parcel, and

migrated downward and downgradient into soil and groundwater in the shallow WBZ on the ASKO parcel.

Time Oil declared bankruptcy in 2016, and TOC Seattle Terminal 1, LLC (TOCST) began negotiations with the Washington State Department of Ecology (Ecology) to sign a Prospective Purchaser Consent Decree (PPCD) for cleanup of the Site in 2018. Ecology and TOCST signed the final PPCD in 2020. A Supplemental Upland Remedial Investigation and Feasibility Study (RI/FS) and Cleanup Action Plan (CAP) were completed in 2020 (Floyd|Snider 2020; Ecology 2020a). Cleanup activities[1] completed by TOCST under the PPCD (Ecology 2020b) on the ASKO parcel in 2021 consisted of in situ stabilization (ISS)—which immobilized TCE-impacted soil, eliminating the source of groundwater contamination—and installation of an interceptor trench with a permeable reactive barrier wall along a portion of the upgradient property line to address the most contaminated perched groundwater flowing onto the ASKO parcel from the BNSF parcel. The interceptor trench was designed only to intercept perched groundwater based on available data at the time of the RI/FS and CAP. A downgradient in situ groundwater treatment barrier was also installed near the conditional point of compliance in the shallow WBZ on the northern portion of the ASKO property. Cleanup action components are shown on Figure 1.

Quarterly post-remedy construction groundwater monitoring at the Site began in 2023, and TOCST has completed seven rounds of monitoring on the ASKO parcel to date.

BNSF signed an Agreed Order (DE18042) with Ecology in 2021 and began RI field activities in 2023. To date, BNSF has completed only a limited work scope consisting of soil collection and four rounds of quarterly groundwater monitoring on the BNSF parcel. TOCST has received quarterly reports presenting the first three rounds of BNSF data collection.

SUMMARY OF PROPERTY LINE AREA DATA

The additional soil and groundwater data recently collected in the vicinity of the ASKO and BNSF property line provide a more complete understanding of the remaining TCE source contamination upgradient of the impermeable subsurface mass created by ISS (referred to as an ISS monolith), particularly within the shallow water bearing zone. The additional hydrogeologic data demonstrate that this remaining source contamination on the BNSF parcel is an ongoing source to groundwater and downgradient migration that has impacted groundwater quality on the ASKO parcel following completion of ISS.

Soil Quality

BNSF installed 11 soil borings (SB-BN-01 through SB-BN-11) in 2023 on the BNSF parcel to supplement the limited previous soil sampling on the parcel performed on behalf of Time Oil. Samples were collected for chlorinated volatile organic compound (cVOC) analysis at depths of

[1] TOCST approached BNSF prior to engineering design for the cleanup action, in an attempt to coordinate cleanup efforts in the area of the ASKO and BNSF property line, but was not successful.

approximately 2.5 feet (within the uppermost vadose zone), 10 feet and 15 feet (both within the perched WBZ), 20 feet (immediately above the shallow WBZ), and 35 feet (immediately below the shallow WBZ). TPH was also analyzed but generally only in the upper soil intervals. TCE results[2] for the BNSF RI samples are shown on Figure 2, which is adapted from a figure developed for the 2020 Supplemental Upland RI/FS.

In samples collected at approximately 20 feet below ground surface, TCE concentrations exceeding the soil cleanup level were detected adjacent to the ASKO property line. A maximum TCE concentration of 30.5 milligrams per kilogram (mg/kg) was detected at SB-BN-06, exceeding the soil cleanup level of 0.020 mg/kg, which is based on protection of groundwater quality. Results from this sample and adjacent SB-BN-05 (TCE result of 1.54 mg/kg) indicate that an area of TCE source contamination remains adjacent to and upgradient of the property line between ASKO and BNSF, which is a source of TCE contamination to groundwater in the shallow WBZ. Concurrent groundwater monitoring data, described below, are consistent with the presence of residual source soil contamination.

Groundwater Quality

BNSF installed five new monitoring wells (four in the perched WBZ and one in the shallow WBZ) on the BNSF parcel during its RI to supplement the existing well network. TOCST and BNSF are separately conducting groundwater monitoring, as described above. During recent monitoring by both parties, BNSF collected groundwater samples for cVOC and TPH analysis in the perched and shallow WBZs on the BNSF parcel and TOCST collected groundwater samples in the shallow WBZ on the ASKO parcel. Table 1 shows the results for cVOCs and total diesel-range organics and oil-range organics (DRO+ORO) from the most recent available dataset compared to the 2020 Supplemental Upland RI/FS dataset (collected in 2019).

TCE concentrations decreased across the perched WBZ relative to their corresponding 2019 results, which is attributed to ongoing interception and treatment by the remedial elements constructed along the upgradient ASKO property line (refer to the summary of hydrogeologic study below for additional discussion of post-remediation groundwater flow in the perched WBZ). TCE did not exceed cleanup levels in the shallow WBZ on the BNSF parcel during 2019 sampling; however, concentrations at new BNSF well MW-BN-03 adjacent to and upgradient of the property line had elevated TCE (1,650 µg/L in the most recent available dataset, compared to the cleanup level of 0.50 µg/L). Similarly elevated TCE was also detected farther southwest of the property line at 01MW93. On the ASKO parcel, elevated TCE was also detected at the gravity well installed during the cleanup action, which is situated in the downgradient direction from

[2] For all BNSF RI data presented in this memorandum, results are provided as received in the laboratory analytical reports transmitted by BNSF without independent validation by TOCST.

MW-BN-03 in the shallow WBZ. TCE cross-gradient from the gravity well at 01MW58R remained stable relative to pre-remediation results at 01MW58.

In contrast, TCE concentrations decreased downgradient of the ISS monolith relative to the 2020 Supplemental Upland RI/FS (for instance at 01MW46R), which is the expected result after immobilization of most of the source mass on the ASKO parcel by ISS. Temporary remobilization effects from ISS were not apparent downgradient of the ISS monolith. The downgradient TCE decreases have corresponded with significant increases in dichloroethene and vinyl chloride, indicating that active but incomplete biodegradation is occurring.

The TCE detections at newly installed shallow WBZ monitoring well MW-BN-03 and the gravity well are consistent with the remaining TCE source mass identified on the BNSF parcel in soil borings adjacent to the property line. Impacts from the TCE source material on the BNSF parcel migrate downgradient onto the ASKO parcel in the shallow WBZ west of the ISS monolith, demonstrated by elevated TCE in samples collected from the gravity well. The recent elevated detections of TCE farther from the property line likely reflect changes in distribution of the remaining dissolved source mass following ISS in the shallow WBZ, as described in further detail below.

Similar to TCE, cleanup level exceedances of lesser magnitude for total DRO+ORO were also detected at the new shallow WBZ well MW-BN-03, and DRO+ORO were newly detected at 01MW93 and at 01MW94 in the shallow WBZ on the BNSF parcel and at 01MW58R on the ASKO parcel. It is assumed that total DRO+ORO impacts in the shallow WBZ are caused by TPH-contaminated soils that are collocated with the residual area of TCE soil contamination near the property line area on the BNSF parcel. However, soil samples were not analyzed in the appropriate interval to confirm this finding.

Hydrogeologic Study

Groundwater elevation measurements are collected quarterly at key perched and shallow WBZ wells on both the ASKO and BNSF properties. One synoptic water level event was coordinated between TOCST and the BNSF RI in the second quarter of 2024.

Elevations in the perched WBZ are similar to pre-remediation elevations on the BNSF parcel; however, perched groundwater is no longer observed on the ASKO parcel. This is attributed to the interceptor trench at the property line, which drains the perched zone. Vertical gradients between the perched and shallow WBZ remain downward on the BNSF parcel, with slightly weaker downward gradients measured after completion of ISS and the interceptor trench. This shows a likely potential for ongoing downward migration of contaminants with groundwater from the perched to the shallow WBZ on the BNSF parcel, although the potential for downward migration is less than prior to remediation of the ASKO parcel. Vertical gradients between

available perched/shallow well pairs 01MW97/01MW93 and 01MW98/01MW94 are summarized in Table 2.

Elevations in the shallow WBZ are consistent with the post-construction elevations predicted by hydraulic modeling that was completed to support ISS design. A potentiometric surface map for the Q2 2024 second quarter synoptic water level event is shown on Figure 3, which is adapted from quarterly summary materials previously prepared for Ecology by TOCST. Shallow WBZ groundwater upgradient of the ISS monolith flows parallel to the property line to the west-northwest with a slight secondary flow direction to the southwest (i.e., between MW-BN-03 and 01MW93). This parallel flow along the property line is a slight shift from preconstruction flow and is attributed to the presence of the ISS monolith. West of the ISS monolith, horizontal flow transitions to an overall northerly direction onto the ASKO parcel, consistent with preconstruction flow conditions. The most recent synoptic water level event prior to completion of ISS (refer to Figure 4, adapted from the 2020 Supplemental Upland RI/FS) had similar results; however, horizontal flow on the BNSF parcel had a slightly more northerly direction.

UPDATED UNDERSTANDING OF PROPERTY LINE CSM

The additional soil, groundwater and hydrogeologic data collected during the BNSF RI have provided a clearer understanding of the remaining TCE source mass in soil and shallow WBZ groundwater in the vicinity of the BNSF and ASKO property line. Following ISS on the ASKO parcel, an area of elevated TCE remains on the BNSF parcel in the vicinity of SB-BN-06/MW-BN-03.

Dissolved TCE exceeding the cleanup level in the shallow WBZ migrates downgradient in the direction of groundwater flow, resulting in cleanup level exceedances at the gravity well on the ASKO parcel. Shifts in the secondary horizontal flow directions following ISS have also caused apparent changes in the TCE plume geometry upgradient of the ISS monolith, resulting in detections of TCE in cross-gradient wells to the southwest on the BNSF parcel. The continued downgradient migration of TCE onto the ASKO parcel poses a recontamination risk to a portion of the Site where cleanup action has already been implemented.

The migration of TPH downgradient onto the ASKO parcel is of lesser concern for achieving cleanup levels because the magnitude of the cleanup level exceedance is much less than the TCE exceedance. However, the geochemical impacts resulting from dissolved petroleum may be of concern for the design basis and performance of the downgradient in situ treatment barrier.

RECOMMENDATIONS

The additional RI data collected on the BNSF parcel demonstrate that remaining source contamination is present on the BNSF parcel, which continues to migrate downgradient onto the ASKO parcel. This source contamination poses an ongoing recontamination risk to remediated areas on the downgradient ASKO parcel and may additionally impact performance of the downgradient in situ groundwater treatment barrier where TOCST has invested significant time,

effort, and financial resources over the past 6 years in close coordination with Ecology to clean up the former Time Oil facility.

TOCST believes that the additional RI data provide sufficient information on the nature, extent, and migration of TCE-contaminated groundwater to demonstrate that an interim action by BNSF is warranted. In accordance with the Model Toxics Control Act, an interim action corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed (WAC 173-340-430(1)(b)). Given the ongoing migration of contaminated groundwater on portions of the ASKO parcel where cleanup action has already been completed, an immediate interim action is needed to correct the problem before it becomes substantially worse. The interim action, to be determined by Ecology and BNSF, would intercept and/or treat contaminated groundwater before it flows onto, and recontaminates, the ASKO parcel.

REFERENCES

Floyd|Snider. 2020. *Supplemental Upland Remedial Investigation and Feasibility Study*. Prepared for Cantera Development Group, LLC. September.

Sound Earth Strategies (SES). 2014. *Remedial Investigation Report*, Asko Hydraulic Property. Prepared for TOC Holdings Co. 23 May.

Washington State Department of Ecology (Ecology). 2020a. *Cleanup Action Plan*, Time Oil Bulk Terminal, Seattle, Washington. 28 September.

_____. 2020b. Prospective Purchaser Consent Decree. October.

LIST OF ATTACHMENTS

Table 1	Focused Groundwater Data
Table 2	Groundwater Vertical Gradients
Figure 1	Site Features
Figure 2	TCE Distribution in Soil
Figure 3	Shallow WBZ Groundwater Elevations—Q2 2024
Figure 4	Shallow WBZ Groundwater Elevations—April–May 2019

Tables

Table 1
Focused Groundwater Data

		Analyte Class	TPH	cVOCs		
		Analyte	Total DRO + ORO	TCE	cis-1,2-DCE	Vinyl Chloride
		Unit	µg/L	µg/L	µg/L	µg/L
		Cleanup Level	500	0.50		0.20
Parcel	Location	Sample Date				
ASKO- Shallow	**01MW15**					
	Pre-remediation	5/2/2019	220 (1)	0.50 U	1.7	**7.2**
	Post-remediation	8/7/2024		**0.59**	8.9	**36**
	01MW46					
	Pre-remediation	5/2/2019	280 (1)	**880**	220	**11**
	Post-remediation	8/7/2024		**160**	610	**96**
	01MW53/01MW53R					
	Pre-remediation	5/2/2019	94 (1)	0.50 U	4.4	**0.26**
	Post-remediation	8/7/2024		**13**	2.0	**0.76**
	01MW56					
	Pre-remediation	5/2/2019	**1,000 (1)**	0.50 U	1.0 U	**0.61**
	Post-remediation	8/7/2024		**0.97**	1.0 U	**1.2**
	01MW58/01MW58R					
	Pre-remediation	5/2/2019	100 (1)	**42**	1.6	**0.30**
	Post-remediation	8/7/2024	**1,300 (1)**	**23**	270	**13**
	01MW80					
	Pre-remediation	5/2/2019	380 (1)	**710**	250	**10**
	Post-remediation	8/7/2024		**180**	350	**65**
	01MW85					
	Pre-remediation	5/3/2019	450 (1)	0.50 U	2.4	**7.9**
	Post-remediation	8/7/2024		**6.5**	1,100	**33**
	01MW89					
	Pre-remediation	5/16/2016	350 (1)	*1.0 U*	1.0 U	0.020 U
	Post-remediation	2/27/2024		0.50 U	1.0 U	0.020 U
	01MW107					
	Pre-remediation	5/6/2019		0.50 U	1.0 U	0.020 U
	Post-remediation	8/7/2024		0.50 U	1.0 U	0.020 U
	Gravity Well					
	Post-remediation	8/7/2024	380 (1)	**840**	540	**6.3**
	MW05					
	Pre-remediation	5/3/2019	310 (1)	**240**	120	**27**
	Post-remediation	8/7/2024		**51**	840	**81**
	MW06					
	Pre-remediation	5/3/2019	370 (1)	**330**	31	**2.8**
	Post-remediation	8/7/2024		**48**	50	**2.1**
BNSF-Perched	**01MW92**					
	Pre-remediation	05/14/2019	**5,900**	**5,200**	570	*40 U*
	Post-remediation	5/17/2024	**3,950**	1,200	212	*4.68 U*
	01MW96					
	Pre-remediation	05/14/2019	**2,600**	**1.5**	3.1	**6**
	Post-remediation	5/17/2024	**3,274**	**3.39**	2.19	**1.47**

Table 1
Focused Groundwater Data

		Analyte Class	TPH	cVOCs		
		Analyte	Total DRO + ORO	TCE	cis-1,2-DCE	Vinyl Chloride
		Unit	µg/L	µg/L	µg/L	µg/L
		Cleanup Level	500	0.50		0.20
Parcel	Location	Sample Date				
BNSF-Perched (cont.)	**01MW97**					
	Pre-remediation	05/14/2019	65 J	**56**	20	0.2 U
	01MW98					
	Pre-remediation	05/14/2019	**4,900**	**810**	57	*2 U*
	Post-remediation	5/18/2024	**4,450**	**339 J**	68.2	*0.546 U*
	MW-BN-01					
	Post-remediation	5/18/2024	**3,710**	**13.8**	1.21	0.0273 U
	MW-BN-02					
	Post-remediation	5/18/2024	258	0.016 U	0.0276 J	0.0273 U
	MW-BN-04					
	Post-remediation	5/17/2024	**8,840**	**1.55**	0.244	0.0273 U
	MW-BN-05					
	Post-remediation	5/17/2024	**8,000**	**0.591**	0.0276 U	0.0273 U
BNSF-Shallow	**01MW93**					
	Pre-remediation	05/14/2019	54	0.5 U	1 U	0.2 U
	Post-remediation	5/18/2024	**2,610**	**1,180**	76.6	*2.34 U*
	01MW94					
	Pre-remediation	05/14/2019	250 U	0.5 U	1 U	0.2 U
	Post-remediation	5/17/2024	**1,232**	**1.41**	0.069 J	0.0273 U
	01MW95					
	Pre-remediation	05/14/2019		0.5 U	1 U	0.2 U
	Post-remediation	5/18/2024		0.016 J	0.0276 U	0.0273 U
	MW-BN-03					
	Post-remediation	5/17/2024		**1,650**	138	*11.7 U*

Notes:

Blanks are intentional. Data not collected for specific analyte.

BOLD Detected exceedance of cleanup level.

Italic Reporting limit exceeds cleanup level.

1 Laboratory noted that the sample chromatographic pattern does not resemble the fuel standard used for quantitation for one or more of the detected concentrations in the sum.

Abbreviations:

ASKO ASKO Hydraulic
BNSF BNSF Railway Company
cVOC Chlorinated volatile organic compound
DCE Dichloroethene
DRO Diesel-range organics
µg/L Micrograms per liter
ORO Oil-range organics
TCE Trichloroethene
TPH Total petroleum hydrocarbons

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the given reporting limit.
UJ Analyte was not detected at the given reporting limit, which is considered estimated.

Table 2
Groundwater Vertical Gradients

Date	Well ID	Water-Bearing Zone	Depth to Water (ft)	Groundwater Elevation (ft)	Screen Top (ft bgs)	Screen Bottom (ft bgs)	Vertical Gradient (ft/ft)
5/10/2013	01MW97	Perched	7.95	50.78	5	15	-1.07
	01MW93	Shallow	30.56	28.36	23.5	38.5	
	01MW98	Perched	6.53	51.2	5	15	-1.00
	01MW94	Shallow	31.21	27.29	28	40	
10/28/2013	01MW97	Perched	9.24	49.49	5	15	-1.00
	01MW93	Shallow	30.49	28.43	23.5	38.5	
	01MW98	Perched	8.23	49.5	5	15	-0.91
	01MW94	Shallow	30.95	27.55	28	40	
3/31/2014	01MW97	Perched	1.05	57.68	5	15	-1.39
	01MW93	Shallow	30.47	28.45	23.5	38.5	
	01MW98	Perched	5.39	52.34	5	15	-1.03
	01MW94	Shallow	30.95	27.55	28	40	
5/14/2019	01MW97	Perched	8.25	50.48	5	15	-1.02
	01MW93	Shallow	29.94	28.98	23.5	38.5	
	01MW98	Perched	6.93	50.8	5	15	-0.95
	01MW94	Shallow	30.55	27.95	28	40	
11/9/2023	01MW97	Perched	4.39	54.44	5	15	-1.13
	01MW93	Shallow	28.32	30.67	23.5	38.5	
	01MW98	Perched	9.76	48.02	5	15	-0.81
	01MW94	Shallow	29.92	28.65	28	40	
11/27/2023	01MW97	Perched	4.23	54.6	5	15	-1.16
	01MW93	Shallow	28.69	30.3	23.5	38.5	
	01MW98	Perched	9.48	48.3	5	15	-0.82
	01MW94	Shallow	29.97	28.6	28	40	
2/20/2024	01MW97	Perched	5.39	53.44	5	15	-1.06
	01MW93	Shallow	27.77	31.22	23.5	38.5	
	01MW98	Perched	7.58	50.2	5	15	-0.89
	01MW94	Shallow	29.74	28.83	28	40	
5/15/2024	01MW97	Perched	10.06	48.77	5	15	-0.86
	01MW93	Shallow	28.31	30.68	23.5	38.5	
	01MW98	Perched	9.84	47.94	5	15	-0.79
	01MW94	Shallow	29.54	29.03	28	40	

Abbreviations:

bgs Below ground surface

ft Feet

Figures

Legend

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Shallow WBZ Monitoring Well-BNSF Property
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well
- Perched WBZ Monitoring Well-BNSF Property
- Monitoring Well Decommissioned in 2023

Well Decommissioning Plan

- Damaged—Decommission Required
- Decommission During Redevelopment

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Planned Property Redevelopment Structure
- Conditional Point of Compliance

Notes

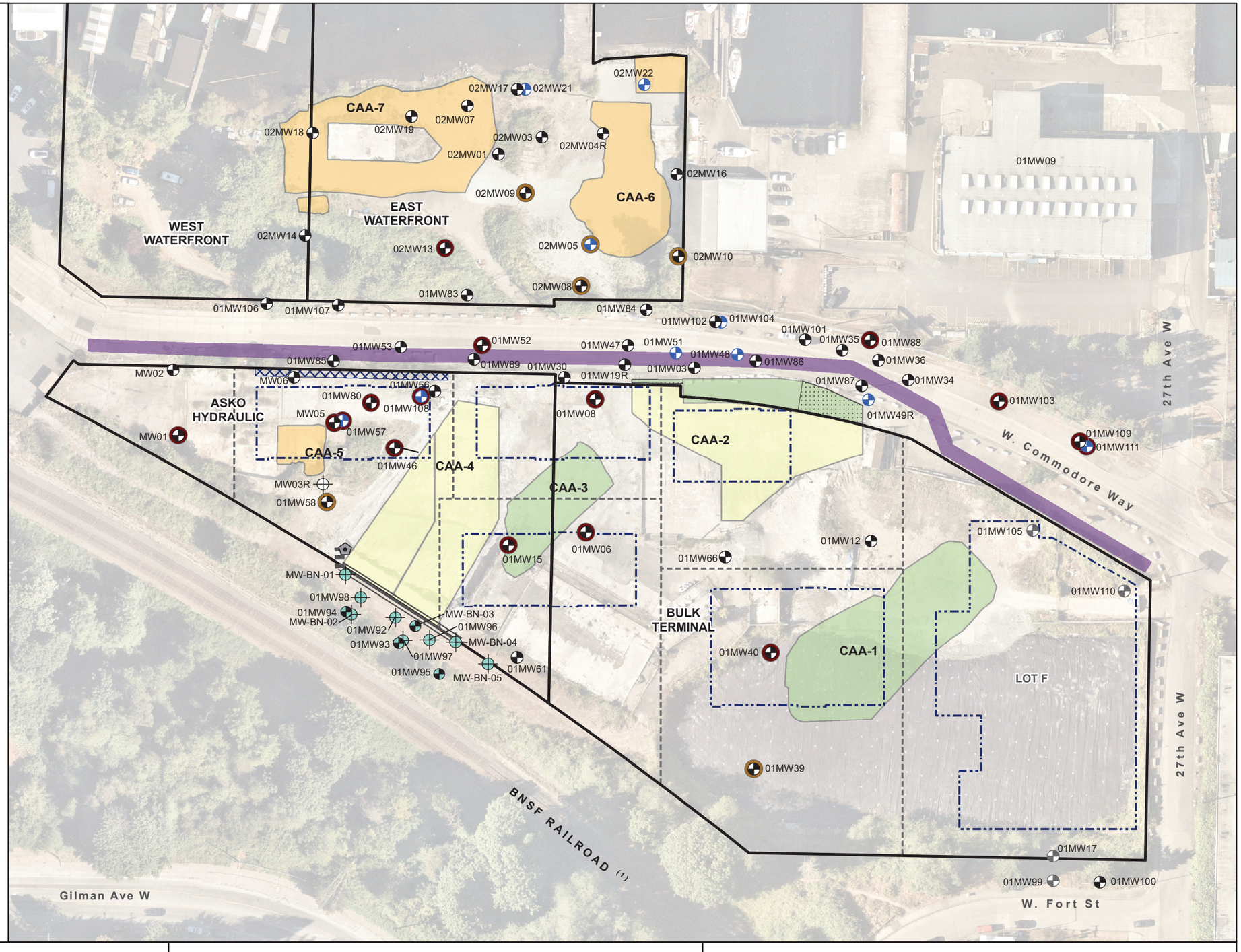
1. Remedial Investigation on the BNSF Railroad parcel is in progress under a separate Agreed Order with the Washington State Department of Ecology.

· Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
· Orthoimagery obtained from Nearmap, 2023.

Abbreviations:
CUL = Cleanup level
ORC-A = Oxygen Release Compound Advanced
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

N



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ASKO and BNSF Property Line Data Summary
Time Oil Bulk Terminal
Seattle, Washington

Figure 1
Site Features

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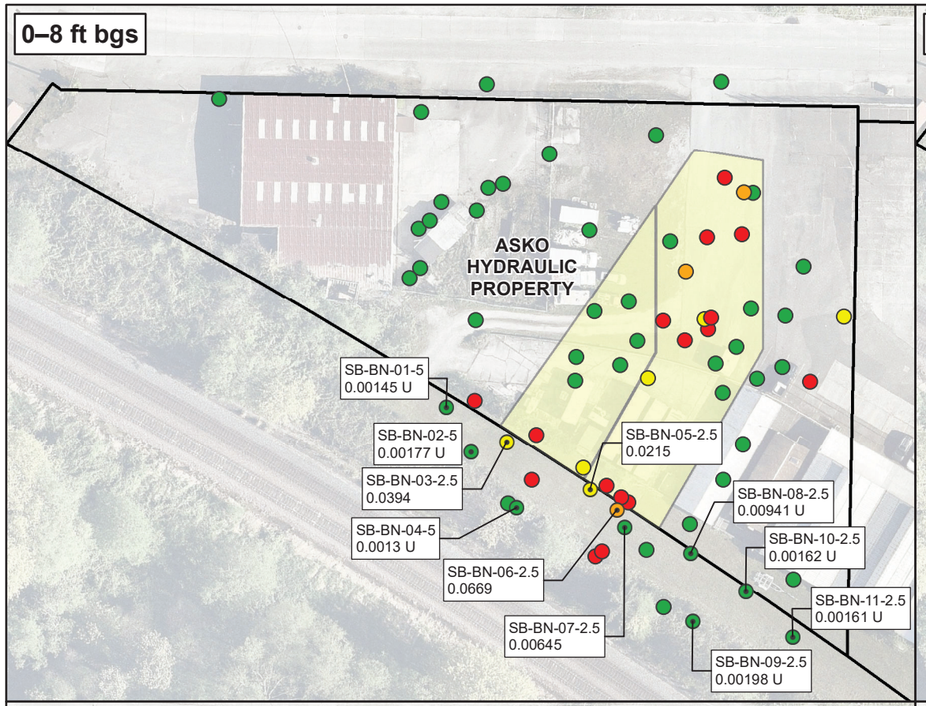
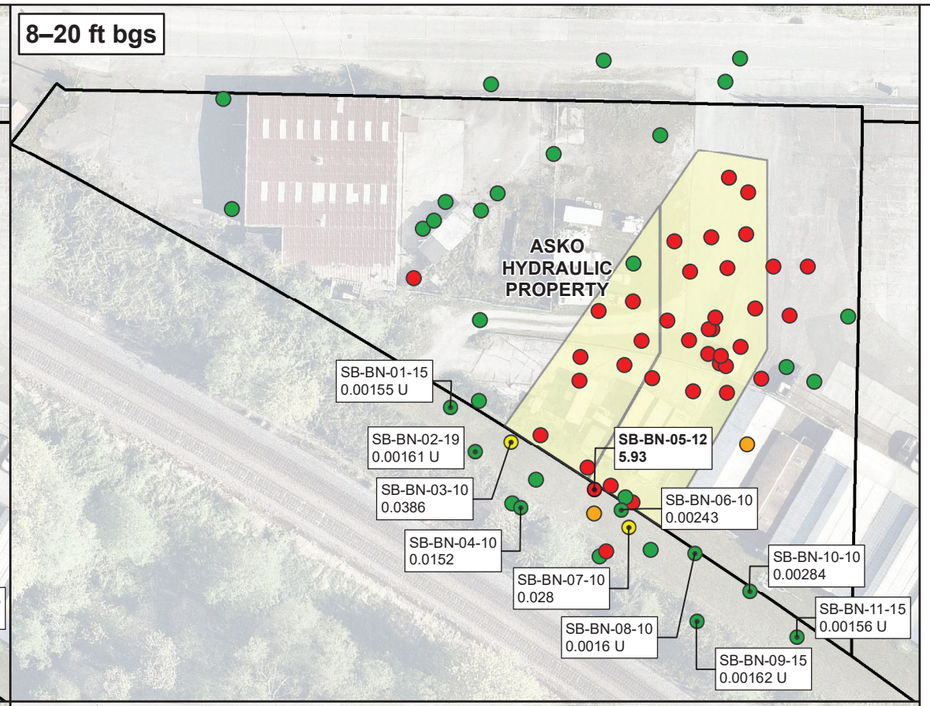
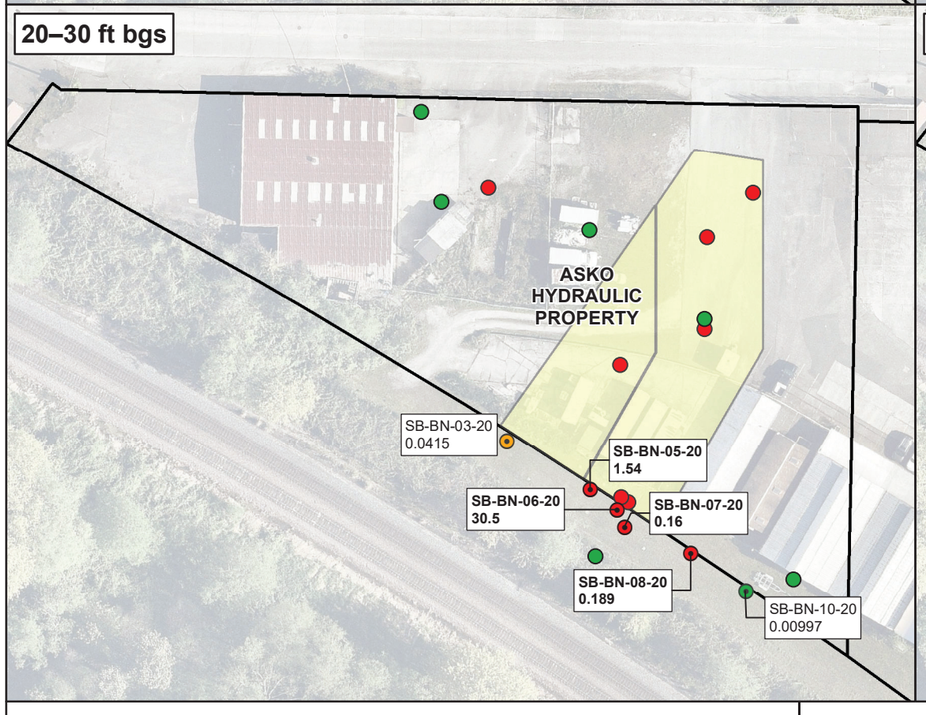
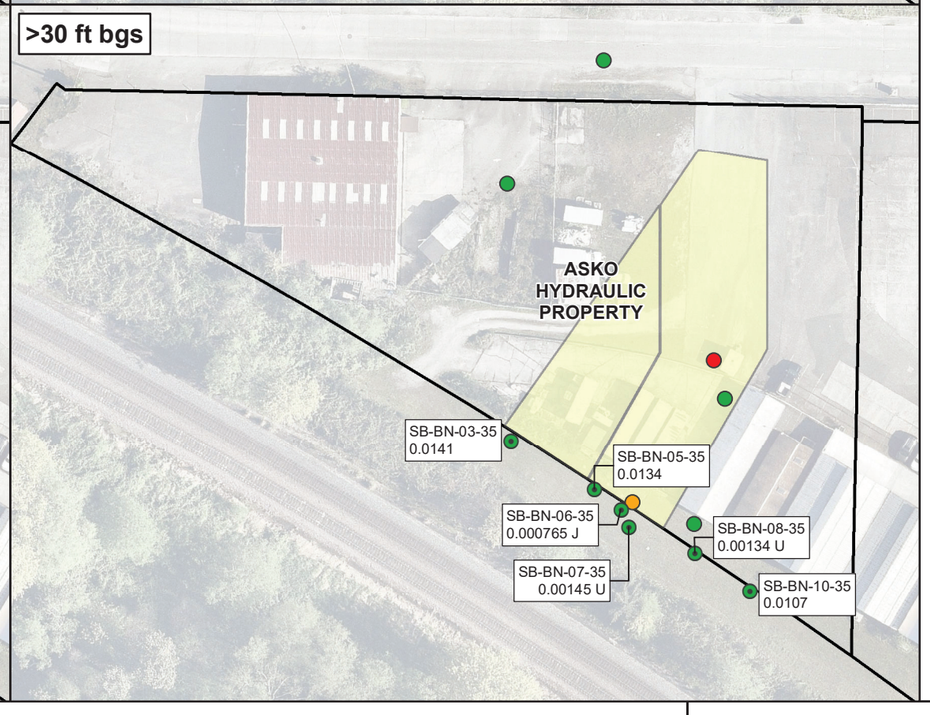
4/23/2024









Legend

- Supplemental Upland RI/FS Location (2019 and prior)
- BNSF RI Location (2023)

Soil Sample Results

- All Results Less Than Criteria
- One or More Results Greater Than Criteria by ≤ 2 times
- One or More Results Greater Than Criteria by > 2 to < 5 times
- One or More Results Greater Than Criteria by ≥ 5 times

Other Site Features

- In Situ Stabilization/Solidification
- Parcel Boundary

Cleanup Level
Trichloroethene: 0.020 mg/kg

Notes:
· Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
· Orthoimagery obtained from Nearmap, 2018.

Abbreviations:
BNSF = BNSF Railway Company
FS = Feasibility study
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
RI = Remedial Investigation
TCE = Trichloroethene

Qualifiers:
J = Concentration is estimated.
U = Analyte was not detected at or above the reporting limit.

N

0 40 80 160
Scale in Feet

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ASKO and BNSF Property Line Data Summary
Time Oil Bulk Terminal PPA
Seattle, Washington

Figure 2
TCE Distribution in Soil

I:\GIS\Projects\Cantera-TOC\01-Tasks\06-Groundwater Monitoring\03-ASKO_BNSF_PropertyLine_DataSummary\01-MapFiles\Figure 2 TCE Distribution in Soil.mxd
9/27/2024

Legend

- Groundwater Contour (feet NAVD 88)
- Shallow WBZ Groundwater Flow Direction

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Shallow WBZ Monitoring Well-BNSF Property

Well Decommissioning Plan

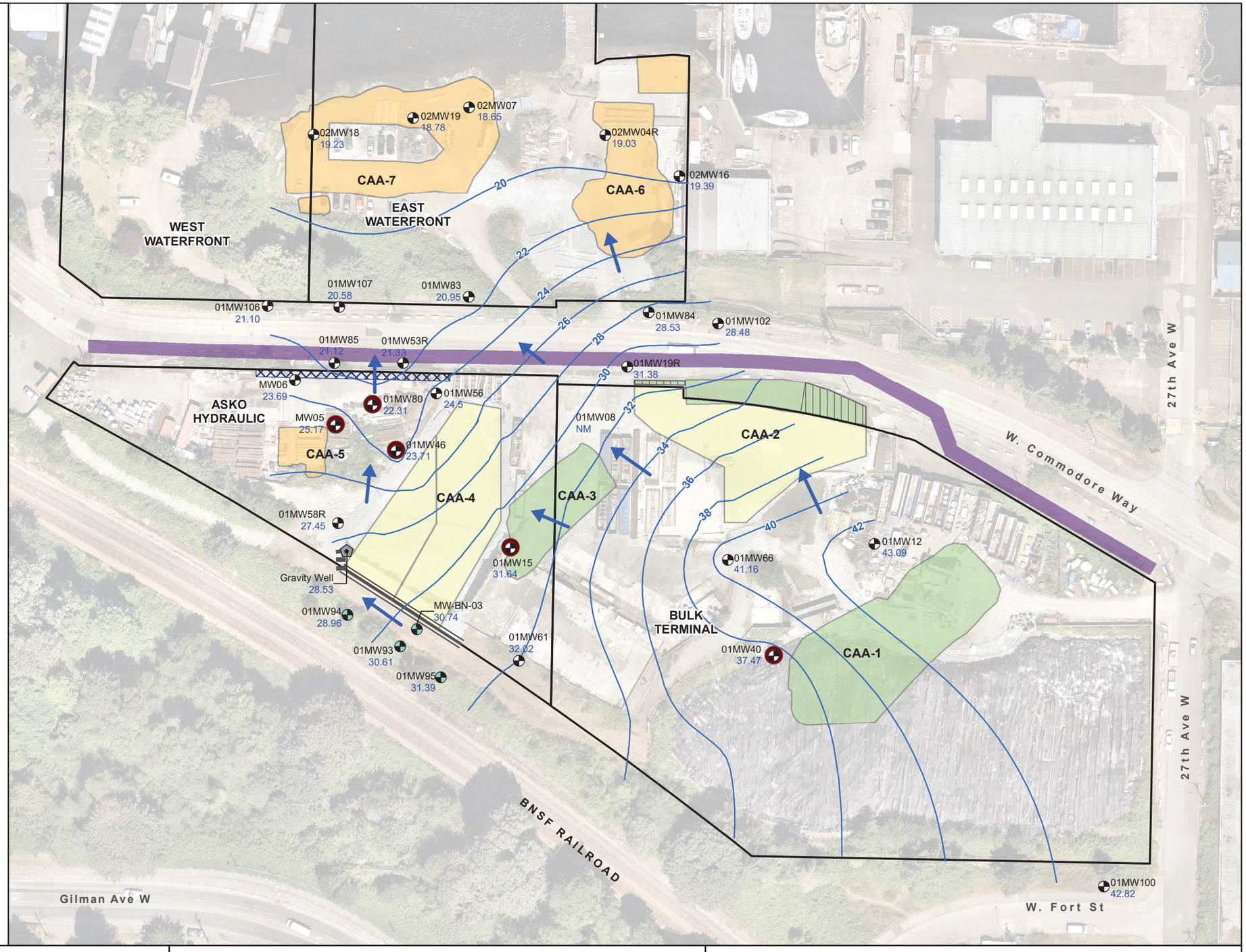
- Decommission During Redevelopment

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- Conditional Point of Compliance



Notes:
- Depth to water measurements not collected at select wells that were inaccessible because they are located within the W. Commodore Way right of way or buried by gravel or vegetation.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2018.

Abbreviations:
CUL = Cleanup level
ORC-A = Oxygen Release Compound Advanced
NAVD 88 = North American Vertical Datum of 1988
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

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ASKO and BNSF Property Line Data Summary
Time Oil Bulk Terminal
Seattle, Washington

Figure 3
Shallow WBZ Groundwater Elevations—
Q2 2024

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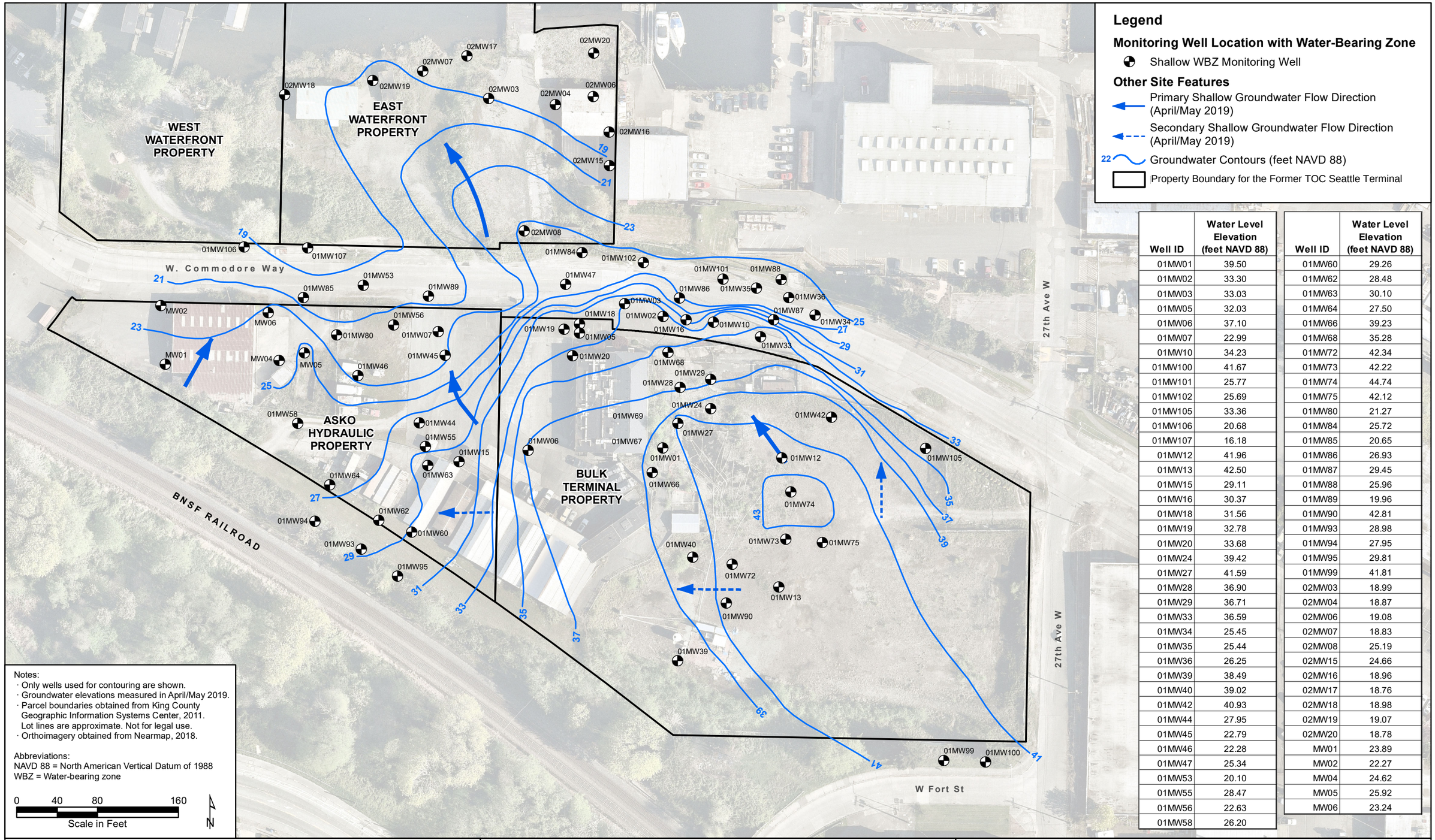

Legend

Monitoring Well Location with Water-Bearing Zone

- Shallow WBZ Monitoring Well

Other Site Features

- Primary Shallow Groundwater Flow Direction (April/May 2019)
- Secondary Shallow Groundwater Flow Direction (April/May 2019)
- Groundwater Contours (feet NAVD 88)
- Property Boundary for the Former TOC Seattle Terminal

Well ID	Water Level Elevation (feet NAVD 88)
01MW01	39.50
01MW02	33.30
01MW03	33.03
01MW05	32.03
01MW06	37.10
01MW07	22.99
01MW10	34.23
01MW100	41.67
01MW101	25.77
01MW102	25.69
01MW105	33.36
01MW106	20.68
01MW107	16.18
01MW12	41.96
01MW13	42.50
01MW15	29.11
01MW16	30.37
01MW18	31.56
01MW19	32.78
01MW20	33.68
01MW24	39.42
01MW27	41.59
01MW28	36.90
01MW29	36.71
01MW33	36.59
01MW34	25.45
01MW35	25.44
01MW36	26.25
01MW39	38.49
01MW40	39.02
01MW42	40.93
01MW44	27.95
01MW45	22.79
01MW46	22.28
01MW47	25.34
01MW53	20.10
01MW55	28.47
01MW56	22.63
01MW58	26.20

Well ID	Water Level Elevation (feet NAVD 88)
01MW60	29.26
01MW62	28.48
01MW63	30.10
01MW64	27.50
01MW66	39.23
01MW68	35.28
01MW72	42.34
01MW73	42.22
01MW74	44.74
01MW75	42.12
01MW80	21.27
01MW84	25.72
01MW85	20.65
01MW86	26.93
01MW87	29.45
01MW88	25.96
01MW89	19.96
01MW90	42.81
01MW93	28.98
01MW94	27.95
01MW95	29.81
01MW99	41.81
02MW03	18.99
02MW04	18.87
02MW06	19.08
02MW07	18.83
02MW08	25.19
02MW15	24.66
02MW16	18.96
02MW17	18.76
02MW18	18.98
02MW19	19.07
02MW20	18.78
MW01	23.89
MW02	22.27
MW04	24.62
MW05	25.92
MW06	23.24

Notes:
- Only wells used for contouring are shown.
- Groundwater elevations measured in April/May 2019.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2018.

Abbreviations:
NAVD 88 = North American Vertical Datum of 1988
WBZ = Water-bearing zone

0 40 80 160
Scale in Feet

N

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ASKO and BNSF Property Line Data Summary
Time Oil Bulk Terminal
Seattle, Washington

Figure 4
Shallow WBZ Groundwater Elevations—
April–May 2019

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