REMEDIAL ACTION COMPLETION REPORT
PHASE 1 – FINAL

Time Oil Bulk Terminal
Seattle, Washington

August 8, 2022

PREPARED FOR:
TOC Seattle Terminal 1, LLC
2753 West 31st Street
Chicago, Illinois 60608

PREPARED BY:

CRETE
CONSULTING, INC.

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Acronyms and Abbreviations

AOC	Area of concern
ARAR	Applicable or Relevant and Appropriate Requirement
ASKO Property	ASKO Hydraulic Property
BDI Plus	Bio-Dechlor INOCULUM Plus
bgs	Below ground surface
BNSF	BNSF Railway Company
CAA	Cleanup action area
CAP	Cleanup Action Plan
cm/sec	centimeter per second
CPOC	Conditional point of compliance
CUL	Cleanup level
CY	Cubic yards
DNR	Washington State Department of Natural Resources
DOT	United States Department of Transportation
DRO	Diesel-range organics
DPT	Direct Push Technologies
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
FBI	Freidman & Bruya, Inc.
FS	Feasibility Study
F|S	Floyd|Snider
Forgen	Forgen, LLC
GMP	Groundwater Monitoring Plan
gpm	Gallons per minute
GRO	Gasoline-range organics
gZVI	Granular zero-valent iron
HMA	Hot Mix Asphalt
IC	Institutional control
IHS	Indicator hazardous substance
ISS	In situ solidification and stabilization

LNAPL	Light non-aqueous-phase liquid
LTCMP	Long-Term Compliance Monitoring Plan
µg/L	Micrograms per liter
mg/kg	Milligrams per kilogram
MTCA	Model Toxics Control Act
mZVI	Microscale zero-valent iron
NAVD 88	North American Vertical Datum of 1988
ORO	Oil-range organics
PanGEO	PanGEO Inc.
PID	Photoionization detector
POC	Point of compliance
PSI	Pounds per square inch
PPCD	Prospective Purchaser Consent Decree
PSCAA	Puget Sound Clean Air Agency
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RACA	Remedial Action Completion Report
RCRA	Resource Conservation and Recovery Act
RRS	REGENESIS Remediation Services
REL	Remediation level
RI	Remedial Investigation
ROW	Right of way
Site	Time Oil Bulk Terminal Site, also referenced as Property
SREMP	Soil and Remedial Element Management plan
TCE	Trichloroethene
TEE	Terrestrial ecological evaluation
TOC	TOC Holdings Co.
TOCST	TOC Seattle Terminal 1, LLC
TPH	Total petroleum hydrocarbons
UCS	Unconfined compressive strength
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound
WAC	Washington Administrative Code
WBZ	Water-bearing zone

Professional Certification

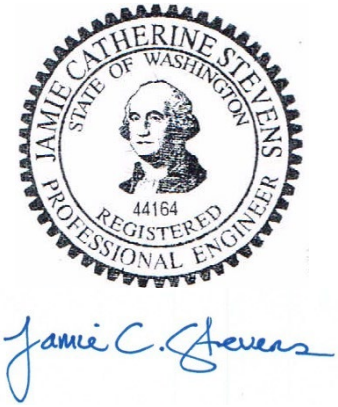
Construction Completion Report
Time Oil Bulk Terminal - 2737-2805 West Commodore Way in Seattle

Based on direct observation made by CRETE Consulting, Inc. (CRETE) personnel, materials testing, laboratory testing, and other construction documentation described in this report, it is the opinion of the undersigned that the Time Oil Bulk Terminal cleanup action construction has been constructed in substantial compliance with the intended design document (Engineering Design Report dated June 28, 2021). The material and data in this report were prepared under supervision and direction of the undersigned.

CRETE Consulting, Inc.

Reid Carscadden P.E.
Washington State PE Number: 29002
Expiration: 4/14/2023
Date Stamped: 1/31/2022

CRETE Consulting, Inc.



Jamie C. Stevens, P.E
Washington State PE Number: 44164
Expiration: 4/28/2023
Date Stamped: 1/31/2022

1 Introduction

This Remedial Action Completion Report (RACR) documents remediation activities conducted by TOC Seattle Terminal 1, LLC (TOCST) at the former Time Oil Bulk Terminal[1] (Property) located on W. Commodore Way in Seattle, Washington. The Property consists of four separate parcels (commonly identified as the Bulk Terminal parcel, ASKO Hydraulic parcel [ASKO parcel], East Waterfront parcel, and West Waterfront parcel) that were acquired by TOCST in November 2020 under the terms of a Prospective Purchaser Consent Decree (PPCD) entered in King County Cause No. 20-2-15215-3 SEA (as amended). These four parcels are collectively termed the Property for purposes of this RACR. The location of the Property is shown on Figure 1, and its surroundings are shown on Figure 2.

This RACR documents the first phase (Phase 1) of the remedial activities completed at the site, while Phase 2 will be prepared to document the final capping and institutional controls for the Upland Area of Concern (AOC) following site development.

The remedial construction was performed to satisfy requirements of the PPCD and was based on the design requirements presented in the Engineering Design Report (EDR, CRETE 2021). This RACR documents the remedial construction activities and associated monitoring conducted from July 19 through December 16, 2021.

The construction was implemented under the Washington Department of Ecology (Ecology) Model Toxics Control Act (MTCA) specified in the Washington Administrative Code (WAC) Part 173-340. This RACR was prepared on behalf of TOCST for review by Ecology.

The Long-Term Compliance Monitoring Plan (LTCMP) will document the post-construction and post-property development monitoring and will include a revised Groundwater Monitoring Plan (GMP, a draft is included in the CAP), Soil and Remedial Element Management Plan (SREMP), and VI Assessment and Contingency Plan, if needed. The LTCMP will be prepared prior to property redevelopment and will be revised, as needed, after Property development.

The physical construction of the majority of the cleanup action was performed by Forgen, LLC (Forgen) under contract to TOCST. Construction quality assurance (CQA) oversight was performed by CRETE Consulting, Inc (CRETE). PanGEO Inc. (PanGEO) provided CQA oversight on elements required by the City of Seattle in the permit documents, mostly related to geotechnical and shoring elements. Regenesis completed the in-situ groundwater treatment element of the cleanup action, with drilling support from ESN Northwest, Inc. (ESN) and oversight performed by Floyd|Snider (F|S). Required quality control/quality assurance (QC/QA) documentation from the cleanup action, including as-built Drawings, confirmation

[1] The parcels include King County Parcel Nos. 1125039050, 1125039081, 1125039120, and 4237900405, also referenced as Property for purposes of this EDR. The legal definition of the Site is set forth in the PPCD.

sampling results, and other data, are provided in Appendices A – K and discussed in the following sections.

1.1 Property Description

The Site, as defined under the MTCA (WAC 1730-340), is generally defined by where a hazardous substance has been deposited, stored, disposed of, or placed, or has otherwise come to be located. The Site includes multiple parcels where hazardous substances were released or have come to be located from industrial operations and is legally defined in the PPCD. Investigations show that multiple releases from former operations have commingled. The CAP includes a detailed summary of the Property and should be referenced for additional details. This section provides a summary of the information presented in the CAP.

The Property encompasses a total of 10.42 acres, with 5.67 acres south of W. Commodore Way and 4.75 acres north of the roadway and along the Salmon Bay shoreline. W. Commodore Way runs between the Bulk Terminal and ASKO parcels to the south and the East Waterfront and West Waterfront parcels to the north (Figure 2).

The Property is composed of four King County tax parcels as noted: Bulk Terminal parcel (No. 1125039050); ASKO parcel (No. 4237900405); East Waterfront parcel (No.1125039120); and West Waterfront parcel (No. 1125039081):

- The 4.10-acre Bulk Terminal parcel on the south side of W. Commodore Way at 2737 W. Commodore Way is bounded to the east by W. Fort Street and beyond by a multi-tenant warehouse building. An active BNSF mainline borders the Bulk Terminal parcel on the south.
- The 1.57-acre ASKO parcel located on the south side of W. Commodore Way at 2805 W. Commodore way is bounded to the west by a multi-tenant warehouse building and beyond by 31st Avenue West. The BNSF mainline also borders this parcel on the south.
- The 3.17-acre East Waterfront parcel located on the north side of W. Commodore Way at 2750 W. Commodore Way is bounded to the east by the Port of Seattle Maritime Industrial Center. Its northern boundary is within Salmon Bay.
- The 1.58-acre West Waterfront parcel north of W. Commodore Way at 2800 W. Commodore Way is bounded to the west by the Lockhaven Apartments and Marina.

The Site, as defined in the PPCD, also includes certain adjoining BNSF Railway Company (BNSF) property (BNSF parcel) and a Washington State Department of Natural Resources (DNR) Aquatic Waterway Use parcel (DNR parcel as shown on Figure 2). The BNSF and DNR parcels were not acquired by TOCST, however Waterway Use Authorization No. 20-A10919 for the DNR parcel was assigned to TOCST. Cleanup of the BNSF parcel will be the subject of a separate legal agreement(s) between BNSF and Ecology. Sediment areas of Salmon Bay, including the DNR parcel, were not included in this cleanup action as they are the subject of certain terms in the PPCD and are outside of the scope of this cleanup action.

1.2 Project Overview

The portions of the Property where cleanup actions were implemented per the EDR are referred to as the Cleanup Action Areas (CAAs) and are shown on Figure 3 and the following provides a summary, as described in the EDR:

- Excavation and off-site disposal of soil with indicator hazardous substance (IHS) concentrations greater than remediation levels (RELs) to the maximum extent practicable in CAA-1, CAA-2.b, CAA-3, and CAA-5
- Light non-aqueous-phase liquid (LNAPL) removal in CAA-1.a and CAA-2.b (there was no appreciable accumulation of LNAPL within excavated areas during soil removal activities, all LNAPL was removed with excavated soils, refer to Section 2-8)
- In situ solidification and stabilization (ISS) to address source area soil with IHS concentrations greater than RELs in CAA-2.a and CAA-4, and LNAPL in CAA-2.a
- In situ groundwater treatment of the TCE groundwater plume using a trademarked colloidal biomatrix (PlumeStopTM) mixed with sulfidated microscale zero-valent iron (mZVI) injected along the W Commodore Way along the northern border of the ASKO parcel
- Installation of an interceptor trench and permeable reactive barrier (PRB) wall adjacent to and upgradient of the ISS monolith in CAA-4.a and CAA-4.b to capture and treat groundwater containing IHSs greater than the CULs from the adjacent BNSF parcel. Treatment of the intercepted groundwater will occur in a PRB wall backfilled with a granular zero-valent iron (gZVI) reactive media and sand mixture, followed by filtration through a treatment vault containing pure gZVI reactive media.
- Excavation and offsite disposal of contaminated soil with IHS concentrations greater than CULs in CAA-6 and CAA-7
- In-situ groundwater treatment in the NE and NW corner of CAA-2.b through application of an oxygen releasing pellet compound to treat approximately 336 cubic yards of contaminated soil and groundwater that will remain beneath utilities in the ROW
- Capping and institutional controls for the Upland Area of Concern (AOC) has been partially completed. Fencing has been installed to restrict access to areas that do not have a gravel cap, shown on Figure 3. Additional capping and institutional controls will be completed in conjunction with site wide redevelopment.

Additional remedial actions completed during the construction activities included the following elements:

- Demolition of buildings and above ground structures prior to remediation work
- Abandonment of monitoring wells which overlap with construction work
- In-situ groundwater treatment in the northwest corner of CAA-2.b through application of an oxygen releasing pellet compound to treat soil and groundwater contamination that will remain beneath utilities in the ROW

- The removal of 9.64 tons of soil contaminated with diesel fuel from an on-site localized spill involving a haul truck fuel tank puncture
- Utility removal and capping to facilitate the cleanup of CAA-2.b

1.3 Performance Criteria

Performance sampling was completed during remedial construction activities in order to demonstrate that performance criteria were met, as specified in the EDR. The purpose of performance monitoring per WAC 173-340-410(1)(b) is to "confirm that the interim action or cleanup action has attained cleanup standards and, if appropriate, remediation levels or other performance standards." The soil excavation performance criteria, which are based on site cleanup levels (CULs) or remediation levels (RELs) are presented in Table 1. The EDR includes details on the development of these CULs or RELs and should be referenced for additional background information (CRETE 2021).

Table 1 Soil Excavation Performance Criteria

AOC	Indicator Hazardous Substance	Performance Criteria (mg/kg)
CAA-1 and CAA-2.b	GRO	5,000 (REL)
	Total DRO+ORO	12,000 (REL)
	Benzene	GRO compliance with soil REL
	LNAPL	No visible LNAPL (REL)
CAA-3	GRO	5,000 (REL)
	Total DRO+ORO	12,000 (REL)
	TCE[1]	1.0 (REL)
CAA-5	Total DRO+ORO	2,000 (CUL)
	Arsenic	7.3 mg/kg (CUL)
CAA-6.a (see note 2)	GRO	30 (CUL)
	Total DRO+ORO	2,000 (CUL)
	DRO	570 (CUL)
	ORO	1,600 (CUL)
	Benzene	0.02 (CUL)
CAA-6.b (see note 2)	GRO	30 (CUL)
	Total DRO+ORO	2,000 (CUL)
	DRO	570 (CUL)
	ORO	1,600 (CUL)
	Benzene	0.02 (CUL)
CAA-7	Arsenic	7.3 mg/kg (CUL)

Notes:
mg/kg Milligrams per kilogram
DRO - Diesel-range organics
CUL – Cleanup Level
TCE – Trichloroethene
AOC – Area of Concern
GRO - Gasoline-range organics
ORO - Oil-range organics
REL – Remediation Level

[1] Most of the confirmation samples from CAA-3 were analyzed for GRO and Total DRO+ORO. Two sidewall confirmation samples from the southwest sidewall and the southernmost base sample, which is adjacent to the location of historical TCE detections in soil greater than the REL were additionally analyzed for TCE.

[2] Arsenic in soil is not listed as an IHS for CAA-6 in Section 4.2 of the CAP; therefore, soil confirmation samples in CAA-6 were not analyzed for arsenic.

Additional performance monitoring included stormwater sampling, ISS sampling, and sampling of import backfill material. All performance sampling is discussed in Section 2.

1.4 Construction Sequence

The construction work was sequenced and executed in discrete work phases and generally completed in the following sequence:

- Demolition and Project Preparation –

  - Demolition activities were conducted March 24, 2021 through May 19, 2021. Asbestos abatement occurred between March 25, 2021 and March 29, 2021. Demolition of above grade structures occurred after abatement, April 7, 2021 through May 19, 2021.
  - Well abandonment was completed between March 19 and 23, 2021 by a licensed driller (ESN Northwest), see Section 2.7. Additional monitoring well 02MW20, which overlapped with the CAA-6.b excavation, was abandoned on September 13, 2021 and well 01MW60, which overlapped with the side slopes of the CAA-4 ISS work, was abandoned on November 11, 2021. Well 01MW72 was initially abandoned in March 2021, but was discovered to be open to the subsurface during remediation work at CAA-1.a; therefore, it was decommissioned again on August 6, 2021.
  - Remediation equipment was mobilized on July 12, 2021 to the site and temporary site facilities and controls were installed and inspected by Ecology on July 15, 2021. Ground disturbing work started on July 19, 2021.
- Soil Excavation with Offsite Disposal was completed July 19, 2021 through November 15, 2021. A total of 15,381.46 tons of contaminated soil was excavated and disposed of off-site. A following table provides a breakdown per CAA.

Table 2 Summary of Soil Excavation Activities

CAA	Date Work Completed	Soil Removed and Disposed Off-Site (tons)
CAA-7	July 19 through 25, 2021	823
CAA-6.a	Concrete slab removal and area preparation from July 19 through 22, 2021, and excavation and off-site disposal from July 23 through August 3, 2021	2,628
CAA-5	July 29 through August 3, 2021	361
CAA-6.b	September 13 through September 14, 2021	568
CAA-1	August 2 through August 16, 2021	5,922 tons of soil from CAA-1.a and -1.b, including 2,511 tons from CAA-1.a and 3,411 tons from CAA-1.b
CAA-2.b	July 27 through October 20, 2021. Work included removing surface concrete and asphalt, installation of a shoring wall prior to excavation activities, soil excavation and off-site disposal, application of 770 lbs of oxygen releasing pellet compound in the NE corner of CAA-2.b, and application of 275 lbs of oxygen releasing pellet compound in the NW corner of CAA-2.b.	3,654
CAA-3	November 5 through November 15, 2021	1,428

- In Situ Solidification
  - ISS mixing in CAA-2.a completed August 18 through September 28, 2021.
  - ISS mixing in CAA-4.a and 4.b completed September 28 through November 20, 2021. Grading and surface stabilization was completed November 21 through December 13, 2021.
  - Swell Management Area (SMA) work overlapped with ISS mixing activities and was completed September 29 through December 13, 2021.
- Groundwater Treatment - In situ groundwater treatment along the northern border of CAA-5 and along the northern border of the ASKO parcel was completed December 7 through 16, 2021.

- Interceptor Trench and Permeable Reactive Treatment - Installation of an interceptor trench and PRB wall adjacent to and upgradient of the ISS monolith in CAA-4.a and CAA-4.b was completed November 2 through 20, 2021.
- Stabilization Surfaces - Final site grading and interim caps were completed on December 13, 2021.

2 Construction Activities

The following section details the construction activities completed at the site. Appendices A through K include relevant documentation produced during the cleanup action including the following:

- Appendix A-1 Confirmation Soil Sampling Maps and Backup – Figures A-1 through A-15 include the locations and sample results from the excavation soil confirmation sampling efforts as well as representative soil confirmation data collected prior to the remedial action. Pre-remediation soil samples that were removed during the cleanup action are also noted on the figures.
- Appendix A-2 As-Built Drawings[2] – includes the final project as-built Drawings.
- Appendix B Photographic Log – includes a photographic log summarizing construction activities.
- Appendix C Copies of Permits – includes copies of the permits received during the construction activity.
- Appendix D Material Waste Summary and Transportation Tickets – includes copies of the waste manifest and transportation tickets for all material that was disposed of off-site.
- Appendix E Confirmation Soil Sampling Analytical Laboratory Reports -includes the laboratory reports and the data validation memorandum supporting the excavation soil confirmation sampling efforts.
- Appendix F Import Product Testing and Tracking – includes the laboratory reports for import products.
- Appendix G Final Compaction Acceptance – includes certification that the compaction was completed per the project specifications.
- Appendix H Well Log – Includes a well log for the gravity installed monitoring well
- Appendix I ISS Confirmation Sampling Analytical Laboratory Reports and Backup- includes the laboratory reports for ISS confirmation sampling efforts.
- Appendix J REGENESIS Remediation Services (RRS) Direct Injection - includes a summary of the RRS direct injection field efforts.
- Appendix K Product Data Sheets – includes copies of safety data sheets and other information for odor suppression foam that was used during the construction activities.

[2] Project as-built drawings will be updated in the Phase 2 RACR to document final cap and site development conditions.

2.1 Construction Contractor Team

The following contractors and subcontractors were used during construction.

- **Demolition General Contractor:** Construction Group International
  19407 144th Ave NE, Bldg D
  Woodinville, WA 98072

- **Remediation General Contractor:** Forgen, LLC
  6558 Lonetree Blvd.
  Rocklin, CA 95765

- **Groundwater Insitu Treatment Contractor:** Regenesis
  1011 Calle Sombra
  San Clemente, CA 92673

- **Aggregate Supplier:** CalPortland – the following mines:
  DuPont WA State Pit B-335
  4301 Pioneer Way
  DuPont, WA 98327

  Manke Family Resources Shelton Mine
  826 Fairmount Avenue
  Shelton, WA 98584

  White River Quarry (loose rip rap for CAA-6.b)
  31107 SE Enumclaw Chinook Pass
  Enumclaw, WA 98022

- **Surveying:** True North Land Surveying
  1930 6th Avenue South, Suite 401
  Seattle, WA 98134

  Axis Survey and Mapping
  15241 NE 90th Street
  Redmond, WA 98052

- **Shoring Inspections:** Mayes Testing Engineers, Inc.
  20225 Cedar Valley Road #110
  Lynnwood, WA 98036

- **SWPPP/TESC** Clear Water Services
  2525 West Casino Road, Suite 7A

Everett, WA 98204

- **Soil Disposal:** Republic Services/Allied Waste Disposal – Roosevelt Regional Landfill
  500 Roosevelt Grade Road
  Roosevelt, WA 99356

  Waste Management – Columbia Ridge Landfill
  18177 Cedar Springs Ln
  Arlington, OR 97812

- **Debris Disposal:** Wasco County Landfill (asbestos waste from demolition)
  2500 Steele Road
  The Dalles, OR 97058

  Republic Services/Allied Waste Disposal – Roosevelt Regional Landfill
  500 Roosevelt Grade Road
  Roosevelt, WA 99356

  Waste Management – Columbia Ridge Landfill
  18177 Cedar Springs Ln
  Arlington, OR 97812

- **Concrete Recyclers**: Renton Concrete Recyclers
  22121 17th Ave S.E. Suite #117
  Bothell, WA 98021

- **Shoring**: DBM Contractors
  1220 South 356 St.
  Federal, WA 98003

- **Asphalt Paving:** Rainier Asphalt & Concrete
  PO Box 85895
  Seattle, WA 98145

- **Drilling:** Cascade
  22722 29th Drive SE Ste 228
  Bothell, WA 98021

  ESN Northwest, Inc.
  1210 Eastside St. SE Suite 200
  Olympia, WA 98501

A detailed summary of construction activities is described in the following subsections. A photographic log collected during construction is presented as Appendix B.

2.2 Preconstruction Documents and Work Plans

The following preconstruction plans were submitted by the Contractor and subsequently accepted by TOCST:

- A Technical Execution Plan (TEP) was accepted on July 11, 2021. This included:
    - Construction sequence and schedule
    - Temporary Erosion and Sedimentation Control measures
    - Construction Water Management Approach
    - Specific equipment and means and methods to complete the scope of work
    - Shoring approach
    - Survey Approach
- Traffic Control Plan was accepted on June 25, 2021.
- Excavation and Dewatering Plan for excavations anticipated to encounter saturated conditions (CAA-2.b, CAA-6.a, and CAA-6.b) was accepted on July 13, 2021.
- ISS mix design testing results and proposed amendment mixture was accepted on July 11, 2021.
- Construction Quality Control Plan was accepted on June 30, 2021.
- Site-specific Construction Health and Safety Plan (HASP) was accepted on June 10, 2021.

2.3 Site Preparation

Demolition activities removed all above ground structures at the site, leaving only building foundations and pavement or concrete surfaces in place. Prior to starting remediation work, Forgen set up temporary site facilities and controls which included worker facilities, a decontamination area, and site access controls. Utilities were verified and temporary erosion and sedimentation controls were implemented per the Stormwater Pollution Prevention Plan (SWPPP). A pre-construction meeting was held on July 13, 2021 to review the schedule, work elements, health and safety, temporary erosion and sedimentation controls (TESC), and site working procedures with the City and Ecology.

For remediation work, any pavement or concrete surfaces that overlapped with CAAs, side slopes, or access areas were broken up and removed from the working areas prior to excavation activities. The site has limited areas of patchy vegetation, any vegetation that overlapped with work areas was cleared and removed from the site prior to remediation activities in that area.

2.4 TESC Measures

The Contractor completed all TESC measures per the SWPPP. TESC measures included:

- Silt fence or silt dams or other perimeter controls.
- Areas outside of working areas or areas not to be disturbed were delineated.
- All construction entrances were stabilized.
- Catch basin inserts were installed in all catch basins that receive drainage from the site.

The bulk of the construction activities occurred during Seattle's dry summer months, the small amount of water that did fall during the summer was contained within work areas and no water was discharged off site during this period. Similarly, no groundwater dewatering was required to complete excavations during the summer months.

For work that was completed during October through December, water was managed on site through surface infiltration or capture within active work areas or discharged to King County through the City of Seattle combined sewer for treatment.

2.5 Permitting

Table 3 lists the permits that were obtained for the construction work. Appendix C includes all permits received.

Table 3 List of Permits

Permitting Official	Type of Permit	Permit Number, Approval Date	Description
City of Seattle	Grading	6807625-GR, 6/30/21	Approval to complete grading work on the waterfront parcel.
		6819513-CN, 6/30/21	Approval to complete grading and shoring work on the ASKO/Bulk Terminals.
		6819513-CN-007, 10/18/21	Approval to extend grading work into 12/7/21.
		6819513-CN-008	Approval to extend grading work into 12/31/21.
Department of Ecology	Stormwater Construction SWPPP	WAR310049, 6/10/21	Approval of SWPPP
King County Discharge	Wastewater Discharge Authorization	Discharge Authorization No. 1145-01, 3/25/21, renewed on 11/30/2021	Approval to discharge industrial wastewater into King County's sewer
City of Seattle	Side Sewer Permit	6847319-SS, 11/08/21	Approval to use the side sewer for discharge of industrial wastewater
City of Seattle	Street Use Permit	SUUMP0000216, 9/3/21	Approval to complete work in the ROW associated with the removing the 6-inch water line
Puget Sound Clean Air Agency	Notification of Asbestos Removal	202100582, 2/5/21	Notification of planned asbestos abatement and removal activities
City of Seattle	Rat Abatement Certification	3/21/21 and 4/20/21	Certification that rat abatement was completed in accordance with City of Seattle building codes

2.6 Decontamination and Health and Safety

The site decontamination procedures and site health and safety requirements were presented in the Contractor's Site Specific Health and Safety Plan dated June 7, 2021 (accepted on June 10, 2021). Decontamination included equipment and personnel decontamination.

The equipment in the work area remained within the limits of the work area until work was completed for each CAA. At the conclusion of work in each CAA, equipment was decontaminated when each work area was completed and moved to the next CAA. All haul trucks that drove on public roads were never allowed to enter the work areas. All haul trucks were direct loaded for export. Trucks were decontaminated using "dry methods" as the primary mechanism and were inspected by the Contractor and any soil material that accumulated on the truck rails, tires, or the tongue were brushed off within the containment berm. Trucks that were used for internal hauling on site, moving soil from ISS areas to the SMA, remained on site and were limited to haul roads on site.

Dry and wet boot basins with brushes were located at entrance and egress points around the perimeter of the containment berm to address personnel decontamination. Personnel leaving the exclusion zone (within the perimeter of the containment berm) were required to decontaminate at these stations.

The drill rig and augers used to install the gravity well was decontaminated once drilling was completed. Augers were decontaminated using an on-site pressure washing station with rinse water incorporated into the ISS mixing work at CAA-4.

Overall health and safety procedures were followed during the construction with no injuries reported. The Contractor monitored the air quality within the workers breathing areas (excavator cab, workers within the excavation area) and perimeter during construction activities. Odor suppressing foam (product: Rusmar Technologies Long Duration Foam AC-645, Appendix K) was used during soil excavations and ISS mixing at the ASKO and Bulk Terminals properties as a precautionary measure. During construction activities all air monitoring was within acceptable ranges.

2.7 Demolition and Monitoring Well Removal

Prior to starting remediation activities at the site, asbestos abatement and demolition of above ground structures, including buildings, warehouses, and remaining components of the historic water treatment system, was completed by Construction Group International.

Four cubic yards of asbestos waste was sent to Wasco County Landfill in April 2021. Asbestos waste documentation is included in Appendix C, as it is included with the permitting documents to ensure correct handling and disposal of asbestos containing waste. Two 55-gallon drums containing extracted groundwater and pentachlorophenol mix were properly disposed of on May 5, 2021, at Burlington Environmental LLC. These drums were associated

with past operations/owners and were not generated by TOCST. As the new owner of the property, TOCST took on the responsibility of generator to properly dispose of these two drums during the demolition phase of the project. Copies of waste manifest and disposal records are included in Appendix D. Also, a 2021 dangerous waste annual report for these two drums was prepared and submitted to Ecology, through the electronic portal, on February 7, 2022.

A total of 420 tons of demolition debris and materials were hauled off site and disposed of Roosevelt landfill. Waste manifest tickets are included in Appendix D. During remediation activities, concrete and asphalt surfaces which overlapped with remediation areas or side slopes were removed and disposed of off-site. Over 1,240 cubic yards of concrete was recycled at Renton Concrete Recyclers, manifests are included in Appendix D.

The majority of site monitoring wells were decommissioned between March 19 and 23, 2021 prior to the start of remediation activities. Existing monitoring wells were decommissioned by a licensed driller (ESN Northwest) in accordance with Washington State Minimum Standards (WAC 173-160). Wells were filled with bentonite chips and hydrated in place. During this scope, monitoring well 01MW42 was inadvertently abandoned by the driller (documented in the First Quarter 2021 Progress Report). This well will be reinstalled if this location is part of the post remedial groundwater monitoring program.

Additional wells were decommissioned during remediation activities as these locations were discovered to overlap excavation or ISS work areas or were inadvertently damaged by the contractor during implementation of the cleanup action. Specifically, monitoring well 02MW20, which overlapped with the CAA-6.b excavation, was abandoned on September 13, 2021 and well 01MW60, which overlapped with the eastern sideslope of the CAA-4 ISS work, was abandoned on November 11, 2021. Well 01MW72 was initially abandoned in March 2021, but was discovered to be open to the subsurface during remediation work at CAA-1.a; therefore, it was decommissioned again on August 6, 2021. These wells (02MW20, 01MW60 and 01MW72) were also decommissioned by a licensed driller (ESN Northwest) in accordance with Washington State Minimum Standards (WAC 173-160). Wells were filled with bentonite chips and hydrated in place. Attempts were made to protect wells 01MW15, 01MW39, 01MW56 and 01MW58 during site construction, but these areas overlap with ISS areas or were in highly congested work areas. The condition of these wells should be assessed, as these wells may need to be abandoned or repaired. The assessment of these wells will be included in the groundwater monitoring activities for the site, documented in the GMP. Prior to implementing the GMP at the site, the condition of all wells selected for groundwater monitoring will be assessed and if needed, repairs will be implemented.

Table 4 includes a summary of the wells that were decommissioned during construction activities. As-built Drawings C-1 through C-11 show all site wells decommissioned prior to or during remediation activities.

Table 4 Decommissioned Monitoring Well Summary
Time Oil Terminal, Seattle WA

ID	Tag #	XY (WA State Plane)		Aprox. Ground Surface (NAVD88)	TOC (NAVD88)	Screen Top (ft bgs)	Screen Bottom (ft bgs)	Diameter	Install Date	Decommissioned Date	Status
01MW01	AFF184	1256198.546	245455.459	46.72	46.41	10.0	25.00	2"	9/11/99	March-21	Decommissioned
01MW02	AFF185	1256198.832	245585.891	45.05	44.77	10.0	25.00	2"	9/11/99	March-21	Decommissioned
01MW04	AFF187	1256163.391	245564.254	45.37	45.01	10.0	25.00	2"	9/11/99	March-21	Decommissioned
01MW05	AFF188	1256114.258	245570.049	45.72	45.28	10.0	25.00	2"	9/11/99	March-21	Decommissioned
01MW07	AFR605	1255976.191	245571.165	45.42	45.09	13.0	28.00	2"	11/27/00	March-21	Decommissioned
01MW08	AFR636	1256071.371	245571.247	45.51	45.15	9.0	24.00	2"	11/22/00	March-21	Decommissioned
01MW09	AFR604	1256103.337	245602.815	44.28	43.87	9.0	25.00	2"	11/27/00	March-21	Decommissioned
01MW10	AFR603	1256247.29	245581.254	45.29	44.95	9.0	25.00	2"	11/27/00	March-21	Decommissioned
01MW11	AFR606	1256369.074	245545.634	46.35	46.04	15.0	30.00	2"	11/28/00	March-21	Decommissioned
01MW13	AFR601	1256313.565	245317.692	46.78	46.35	5.0	20.00	2"	11/17/00	March-21	Decommissioned
01MW16	AGF506	1256220.356	245583.598	45.19	44.86	10.0	20.00	2"	7/19/01	March-21	Decommissioned
01MW18	AGT783	1256114.422	245578.178	45.41	45.09	5.0	25.00	4"	3/11/02	March-21	Decommissioned
01MW19	AGT784	1256100.858	245573.332	45.53	45.27	5.0	25.00	4"	3/11/02	March-21	Decommissioned
01MW20	AGT785	1256107.488	245547.857	46.43	46.18	5.0	25.00	4"	3/11/02	March-21	Decommissioned
01MW24	AHR826	1256245.927	245494.565	---	44.35	5.0	19.00	4"	12/3/02	March-21	Decommissioned
01MW27	AHR829	1256213.777	245479.818	46.64	47.18	5.0	19.00	4"	12/4/02	March-21	Decommissioned
01MW28	AHR830	1256214.494	245514.705	46.21	45.48	5.0	23.00	4"	12/5/02	March-21	Decommissioned
01MW29	AHR831	1256245.006	245523.025	45.86	45.49	5.0	19.00	4"	12/5/02	March-21	Decommissioned
01MW31	APL576	1256123.284	245641.356	44.22	43.80	5.0	15.00	2"	7/6/06	March-21	Decommissioned
01MW32	APL577	1256213.061	245636.327	44.72	44.33	17.0	27.00	2"	7/6/06	March-21	Decommissioned
01MW33	APL578	1256294.549	245567.649	45.54	45.07	5.0	20.00	2"	7/7/06	March-21	Decommissioned
01MW37	APL370	1256460.684	245345.926	46.78	48.58	7.5	22.50	2"	9/7/06	March-21	Decommissioned
01MW38	APL371	1256387.197	245312.754	46.52	48.57	7.5	22.50	2"	9/7/06	March-21	Decommissioned
01MW42	APL376	1256365.694	245485.928	---	47.89	7.0	22.00	2"	9/8/06	March-21	Decommissioned
01MW43	APL376	1256295.84	245528.235	45.97	45.65	7.0	22.00	2"	9/8/06	March-21	Decommissioned
01MW44	ALN355	1255957.353	245480.387	49.83	49.46	15.0	30.00	2"	9/13/06	March-21	Decommissioned
01MW45	ALN356	1255982.964	245547.291	46.16	45.89	12.0	27.00	2"	9/13/06	March-21	Decommissioned
01MW49	APA854	1256270.197	245595.342	45.51	44.93	15.0	25.00	2"	12/21/06	March-21	Decommissioned
01MW50	APA855	1256052.698	245613.705	44.01	43.48	15.0	25.00	2"	12/21/06	March-21	Decommissioned
01MW54	Missing	1255960.969	245481.297	49.69	49.25	37.0	42	2"	11/13/08	March-21	Decommissioned
01MW55	Missing	1255963.368	245456.978	50.73	50.37	16.0	31	2"	11/13/08	March-21	Decommissioned
01MW59	Missing	1256070.393	245507.691	46.82	46.49	13.5	28.5	2"	11/17/08	March-21	Decommissioned
01MW60	BBA842	1255949.81	245372.301	58.43	58.01	25.0	39	2"	12/29/08	November-21	Decommissioned
01MW62	BBA844	1255917.14	245383.818	58.90	58.54	24.0	39	2"	12/30/08	March-21	Decommissioned
01MW63	BBA845	1255965.916	245438.418	54.63	54.38	19.5	32	2"	12/30/08	March-21	Decommissioned
01MW64	BBL 514	1255868.572	245419.087	58.21	57.74	25.0	40	2"	3/17/09	March-21	Decommissioned
01MW65	BBL 515	1255960.026	245458.681	50.72	50.42	52.0	62.00	2"	3/18/09	March-21	Decommissioned

Table 4 Decommissioned Monitoring Well Summary
Time Oil Terminal, Seattle WA

ID	Tag #	XY (WA State Plane)		Aprox. Ground Surface (NAVD88)	TOC (NAVD88)	Screen Top (ft bgs)	Screen Bottom (ft bgs)	Diameter	Install Date	Decommissioned Date	Status
01MW67	BCS163	1256184.972	245466.303	---	44.4	9.0	24	2"	7/24/09	March-21	Decommissioned
01MW68	BCS164	1256200.752	245550.223	---	45.35	7.0	22	2"	7/24/09	March-21	Decommissioned
01MW69	BCS165	1256185.719	245487.237	---	44.14	9.0	24	2"	7/24/09	March-21	Decommissioned
01MW70	BCP158	1255893.427	245401.995	---	58.14	5.0	20	2"	2/11/10	March-21	Decommissioned
01MW71	BCP159	1255905.782	245392.587	---	58.38	5.0	20	2"	2/11/10	March-21	Decommissioned
01MW72	Missing	1256266.926	245340.022	---	46.33	3.0	23	2"	3/10/10	August-21	Decommissioned
01MW73	Missing	1256320.225	245365.318	---	46.25	3.0	21.5	2"	3/10/10	March-21	Decommissioned
01MW74	Missing	1256325.492	245411.63	---	46.17	4.0	21.5	2"	3/10/10	March-21	Decommissioned
01MW75	Missing	1256356.651	245361.709	46.70	46.30	3.0	18	2"	3/10/10	March-21	Decommissioned
01MW76	BHB076	1255978.228	245547.499	46.20	45.79	35.0	40	2"	2/28/11	March-21	Decommissioned
01MW77	BHB077	1255966.601	245455.602	50.76	50.30	36.0	41	2"	3/3/11	March-21	Decommissioned
01MW78	BHB078	1255913.408	245386.34	58.82	58.17	45.0	50	2"	3/3/11	March-21	Decommissioned
01MW79	BHB079	1255967.126	245441.612	54.69	54.36	5.0	19	2"	3/3/11	March-21	Decommissioned
01MW81	BHB247	1255843.151	245545.983	46.23	45.86	19.5	28.5	2"	4/18/11	March-21	Decommissioned
01MW82	BHB248	1255847.49	245545.005	46.14	45.68	19.0	27	2"	4/18/11	March-21	Decommissioned
01MW87	BHB267	1256308.361	245582.453	45.62	45.27	11.0	21	2"	4/20/11	March-21	Decommissioned
01MW90	BHM071	1256261.678	245301.854	47.03	46.66	3.0	18	2"	12/29/11	March-21	Decommissioned
01MW91	BHM072	1256304.914	245331.207	47.08	46.52	3.0	18	2"	12/29/11	March-21	Decommissioned
02MW04	AFF191	1256092.163	245795.939	27.48	27.07	10.0	20	2"	9/13/99	March-21	Decommissioned
02MW06	Missing	1256129.684	245803.915	26.86	26.55	9.5	19.5	2"	11/22/00	March-21	Decommissioned
02MW09	BAN058	1256009.22	245753.69	30.73	30.27	7.0	12	3/4"	10/11/07	March-21	Decommissioned
02MW15	BAH915	1256145.711	245735.504	27.48	27.201	5.0	15	2"	4/23/15	March-21	Decommissioned
02MW20	BLR572	1256130.2	245847.111	20.56	20.07	1.0	11	2"	4/25/19	September-21	Decommissioned
MW03	APK543	1255806.658	245528.265	46.84	46.20	7.0	14	2"	4/18/06	March-21	Decommissioned
MW04	APK544	1255818.651	245542.307	46.75	46.27	18.0	28	2"	4/18/06	March-21	Decommissioned
01IW10	BCP162	1255954.926	245475.7	---	50.126	24.0	29.00	2"	2/12/10	March-21	Decommissioned
01SVE01	BCP160	1255955.084	245462.4	---	50.645	5.0	13.00	2"	2/11/10	March-21	Decommissioned

Notes:
TOC = top of casing
ft bgs = feet below ground surface

2.8 Construction - LNAPL Removal/Immobilization

The cleanup action called for the removal of LNAPL if encountered in CAA-1.a, in the area of the former tank farm, and at CAA-2.b within the W. Commodore Way ROW. LNAPL was removed using standard excavation means and methods (see Section 2.9). During cleanup actions, other than occasional small isolated sheens on ponded stormwater/groundwater, there was no appreciable accumulation of LNAPL within excavated areas during soil removal activities and thus no vacuum extraction was required. Ecology was notified of the absence of LNAPL in CAA-1.a in an email sent on August 9, 2021 by Jamie Stevens, CRETE Consulting. To ensure that free phase LNAPL was not present at CAA-1.a, three test pits were extended to 10 and 16 feet below pre construction surface (below the limits of the excavation), with no observation of sheen or LNAPL in soils or on groundwater that flowed into the test pits, locations are shown on Figure A-1 (Appendix A-1).

Excavated soils from CAA-1 and CAA-2.b did include discolored (stained) soils, elevated photo-ionization detector (PID) concentrations and strong petroleum hydrocarbon odors, indicative of residual LNAPL within the soil matrix, which was captured during excavation and hauled off site.

At CAA-2.a, anticipated LNAPL was immobilized by encapsulation using ISS technology, as described in Section 2.10.

Confirmation Samples and Deviations from Design

No confirmation samples were required for this construction element, see Section 2.9 (Soil Excavation with Offsite Disposal) and Section 2.10 (In Situ Solidification) for details on confirmation samples.

As stated above, no LNAPL accumulation was present and no vacuum extraction was completed. All LNAPL impacted soil was removed during soil excavation activities at CAA-1.a and CAA-2.b.

No deviations from the design occurred for this construction element.

2.9 Construction - Soil Excavation with Offsite Disposal

From July 19 through November 15, 2021, Forgen completed excavation and backfill activities at CAA-1, CAA-2.b, CAA-3, CAA-5, CAA-6 and CAA-7. CRETE provided construction oversight during all cleanup activities. The results of soil confirmation sampling efforts are summarized on Tables 5 through 13. Soil confirmation sample locations, including representative samples from pre remedial action investigations and those collected during the remedial action, are shown on Figures A-1 through A-14 in Appendix A-1. As-built Drawings C-2 through C-6 provide the excavation as-built Drawings for each CAA, provided in Appendix A-2. Appendix B includes a photographic log of activities. A total of 15,391 tons

of soil and debris were excavated from the cleanup action area and disposed of at Roosevelt Regional Landfill in Roosevelt (12,673 tons), Washington and Columbia Ridge Landfill in Arlington, Oregon (2,718 tons). Copies of waste manifest tickets and transportation summary tickets are included in Appendix D. Appendix E includes laboratory reports from the soil confirmation samples.

Confirmation Samples

Excavation confirmation sampling was conducted per Appendix G of the EDR - Construction Compliance Monitoring Plan – Sampling and Analysis/Quality Assurance Project Plan (Compliance Monitoring Plan, CRETE 2021).

Confirmation sampling included sidewall and bottom samples to supplement existing data; locations are shown on Figures A-1 through A-14 (Appendix A-1). Samples were collected as non-sieved, grab samples from the sidewall or bottom directly or occasionally from the excavator bucket if necessary due to trench safety and access constraints. Soil from each sidewall location was spooned into a dedicated disposable plastic Ziploc bag with a dedicated disposable plastic scoop and homogenized where applicable. The soil within the bag was then transferred to the laboratory-supplied sample jars. Select constituents, including benzene, GRO, volatile organic compounds (VOC) samples (including trichloroethene) were not homogenized, these samples were collected using EPA Method 5035A and separate concurrent samples were collected directly into sample containers prior to homogenization.

2.9.1 CAA-1

A total of 5,921 tons of contaminated soil were excavated and disposed of off-site from CAA-1.a and -1.b, including 2,510.6 tons from CAA-1.a and 3,410.6 tons from CAA-1.b to remove GRO, Total DRO+ORO, and benzene at concentrations greater than the RELs. Soils were excavated as shown on as-built Drawing C-2 using standard excavation means and methods (hydraulic excavators). The final excavation limits (horizontal and vertical), grades, and profiles were advanced in some areas beyond what was shown on the EDR Drawings, as required to remove visually contaminated soil, based on field observations and performance sampling results.

Prior to re-decommissioning of monitoring well 01MW72 as described in Section 2.7, LNAPL was observed floating at the top of water and in the sand filter pack of monitoring well 01MW72 (the sand filter pack was exposed during soil excavation). The excavation was extended to completely remove the monitoring well and filter pack, down to approximately 12 ft bgs in the immediate vicinity of monitoring well 01MW72, as shown on as-built Drawing C-2. Note that prior to the removal of well 01MW72, the well was properly decommissioned as detailed in Section 2.7. All visual indication of LNAPL was associated with the monitoring well sand filter pack and not on surrounding site soils.

Confirmation Samples

Excavation confirmation sampling was conducted per the Compliance Monitoring Plan as previously described. Soil samples from CAA-1 were analyzed for total petroleum hydrocarbon (TPH) diesel and oil range organics (DRO and ORO) by Ecology Method NWTPH-Dx, and TPH-gasoline (GRO) by Ecology Method NWTPH-Gx.

Tables 5 through 6 summarize the sample results and Figure A-1 shows sample locations. All soil samples collected from the final excavated extent of CAA-1 were below the RELs.

Deviations from Design

Site monitoring wells were decommissioned in March 2021, but well 01MW72, located within the CAA-1a footprint, was discovered to remain open to the subsurface during remediation activities. It is likely that the bentonite that was placed inside the well made a blockage (sometimes called bridging) and did not completely fill the well to depth. This well was decommissioned on August 6, 2021 by ESN drilling, a WA State licensed well driller (See Section 2.7). The excavation was extended in the vicinity of 01MW72 to remove the well, sand filter pack and soils in the vicinity of the monitoring well.

Excavation sidewall samples from the northeast wall of CAA-1.b exceeded RELs and additional soil removal was completed along this portion to extend the excavation past the original design boundary, shown on as-built Drawing C-2. Along the southwestern sidewall, a small area of soil staining was noted and this area was over excavated to remove all stained soil (as-built Drawing C-2). New confirmation sidewall samples (CAA-1B-SS-06 and CAA-1B-SS-08) were collected to confirm the excavation limits of both of these areas, shown on Figure A-1 (Appendix A-1).

No other deviations from the design occurred for this construction element at CAA-1.

Table 5 Confirmation Soil Sample Results - CAA-1.a
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	REL (mg/kg)
~~CAA1A-BASE-01~~	~~8/9/2021~~	~~5~~	~~Base~~	~~Gasoline-range organics~~	~~4,400~~		~~5,000~~
	~~8/9/2021~~	~~5~~	~~Base~~	~~Total DRO & ORO~~	~~34,500~~	~~J x~~	~~12,000~~
CAA1A-TP3-7	8/6/2021	12	Base, replacement CAA1A-Base-01, See Note 1	Gasoline-range organics	5	U	5,000
	8/6/2021	12	Base, replacement CAA1A-Base-01, See Note 1	Total DRO & ORO	250	U	12,000
CAA1A-BASE-02	8/10/2021	5	Base	Gasoline-range organics	1,100	J	5,000
	8/10/2021	5	Base	Total DRO & ORO	560		12,000
CAA1A-BASE-03	8/9/2021	5	Base	Gasoline-range organics	5	U	5,000
	8/9/2021	5	Base	Total DRO & ORO	250	U	12,000
CAA1A-SS-01	8/11/2021	3.5	Sidewall	Gasoline-range organics	120		5,000
	8/11/2021	3.5	Sidewall	Total DRO & ORO	330		12,000
CAA1A-SS-02	8/10/2021	4	Sidewall	Gasoline-range organics	330		5,000
	8/10/2021	4	Sidewall	Total DRO & ORO	3,000		12,000
CAA1A-SS-03	8/6/2021	4	Sidewall	Gasoline-range organics	5	U	5,000
	8/6/2021	4	Sidewall	Total DRO & ORO	250	U	12,000
CAA1A-SS-04	8/6/2021	4	Sidewall	Gasoline-range organics	5	U	5,000
	8/6/2021	4	Sidewall	Total DRO & ORO	250	U	12,000
~~CAA1A-SS-05~~	~~8/9/2021~~	~~1.5~~	Sidewall	~~Gasoline-range organics~~	~~2,700~~		~~5,000~~
	~~8/9/2021~~	~~1.5~~	~~Sidewall~~	~~Total DRO & ORO~~	~~52,000~~	~~J x~~	~~12,000~~
CAA1A-SS-06	8/11/2021	1.5	Sidewall, replacement CAA1A-SS-05	Gasoline-range organics	5	U	5,000
	8/11/2021	1.5		Total DRO & ORO	250	U	12,000
CAA1A-TP3-9	8/6/2021	14	See Note 2	Gasoline-range organics	5	U	5,000
	8/6/2021	14	See Note 2	Total DRO & ORO	250	U	12,000
CAA1A-TP4-8	8/6/2021	8	See Note 2	Gasoline-range organics	35		5,000
	8/6/2021	8	See Note 2	Total DRO & ORO	280		12,000
CAA1A-TP4-12.2	8/6/2021	12.2	See Note 2	Gasoline-range organics	5	U	5,000
	8/6/2021	12.2	See Note 2	Total DRO & ORO	250	U	12,000
CAA1A-TP4-13.9	8/6/2021	13.9	See Note 2	Gasoline-range organics	5	U	5,000
	8/6/2021	13.9	See Note 2	Total DRO & ORO	250	U	12,000

Notes:

Sample results greater than REL.

~~CAA-1a~~ Sample represents a location that was over excavated, soil was removed and disposed of off-site

CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
LNAPL = Light non-aqueous phase liquid
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level
U = Analytes is not detected at the associated reporting limit.
J = Estimated concentration, laboratory recovery fell outside of control limits (high) due to sample matrix effects
x = The sample chromatographic pattern does not resemble the fuel standard used for quantitation
Note 1 - CAA-1A-TP3-7 is the replacement sample for CAA-1A-BASE-01. The excavation was extended to completely remove the monitoring well and filter pack associated with 01MW72, down to 12 ft bgs.
Note 2 - Two test pits (TP3 and TP4) were advanced at the bottom of CAA-1a to determine if light non-aqueous phase liquid (LNAPL) was present. Data was collected for information purposes only. No LNAPL was observed.

Table 6 Confirmation Soil Sample Results - CAA-1.b
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	REL (mg/kg)
CAA1B-BASE-01	8/10/2021	10	Base	Gasoline-range organics	13		5,000
	8/10/2021	10	Base	Total DRO & ORO	250	U	12,000
CAA1B-BASE-02	8/26/2021	10	Base	Gasoline-range organics	57		5,000
	8/26/2021	10	Base	Total DRO & ORO	250	U	12,000
CAA1B-SS-01	8/10/2021	9	Sidewall	Gasoline-range organics	8		5,000
	8/10/2021	9	Sidewall	Total DRO & ORO	250	U	12,000
~~CAA1B-SS-02~~	~~8/10/2021~~	~~7~~	~~Sidewall, removed & disposed~~	~~Gasoline-range organics~~	~~2,600~~	~~J~~	~~5,000~~
	~~8/10/2021~~	~~7~~	~~Sidewall, removed & disposed~~	~~Total DRO & ORO~~	~~31,400~~	~~J x~~	~~12,000~~
~~CAA1B-SS-04~~	~~8/12/2021~~	~~6.5~~	~~Sidewall, removed & disposed~~	~~Gasoline-range organics~~	~~6,900~~	~~J~~	~~5,000~~
	~~8/12/2021~~	~~6.5~~	~~Sidewall, removed & disposed~~	~~Total DRO & ORO~~	~~10,300~~	~~x~~	~~12,000~~
~~CAA1B-SS-05~~	~~8/12/2021~~	~~6.5~~	~~Sidewall, removed & disposed~~	~~Gasoline-range organics~~	~~3,500~~		~~5,000~~
	~~8/12/2021~~	~~6.5~~	~~Sidewall, removed & disposed~~	~~Total DRO & ORO~~	~~13,890~~	~~x~~	~~12,000~~
~~CAA1B-SS-06~~	~~8/16/2021~~	~~6~~	~~Sidewall, removed & disposed~~	~~Gasoline-range organics~~	~~5,200~~		~~5,000~~
	~~8/16/2021~~	~~6~~	~~Sidewall, removed & disposed~~	~~Total DRO & ORO~~	~~8,450~~	~~x~~	~~12,000~~
CAA1B-SS-08	8/18/2021	7	Sidewall, replacement CAA1B-SS-02	Gasoline-range organics	4,500	J	5,000
	8/18/2021	7		Total DRO & ORO	9,220	x	12,000
CAA1B-SS-03	8/10/2021	8.5	Sidewall	Gasoline-range organics	9.7		5,000
	8/10/2021	8.5	Sidewall	Total DRO & ORO	250	U	12,000

Notes:

Sample results greater than REL.

~~CAA-1b~~ Sample represents a location that was over excavated, soil was removed and disposed of off-site

CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level
U = Analytes is not detected at the associated reporting limit.
J = Estimated concentration, laboratory recovery fell outside of control limits (high) due to sample matrix effects
x = The sample chromatographic pattern does not resemble the fuel standard used for quantitation

2.9.2 CAA-2.b

A total of 3,654 tons of contaminated soil were excavated and disposed of off-site from CAA-2.b, to remove GRO, Total DRO+ORO, and benzene at concentrations greater than the RELs. Soils were excavated as shown on as-built Drawing C-3 using standard excavation means and methods. Shoring (including trench boxes) was installed along the three sides of the excavation: north, east and west faces. The CAA-2.a ISS monolith (discussed in Section 2.10) acted as a shoring wall along the south side of the excavation. Utilizing shoring on all 4 sides allowed the 15 ft excavation to have vertical sidewalls. The final excavation limits (horizontal and vertical), grades, and profiles are consistent with the original design configuration shown on the EDR Drawings. Excavated soils from CAA-2.b included discolored (stained) soils, elevated PID concentrations and strong petroleum hydrocarbon odors, indicative of residual LNAPL within the soil matrix, which was captured during excavation and hauled off site. As noted in Section 2.6, odor suppressing foam (product: Rusmar Technologies Long Duration Foam AC 645, Appendix L) was used during soil excavation work as a precautionary measure.

ORC Advanced amendments were added during backfilling activities in the northeast corner and northwest corner to enhance biodegradation of any remaining petroleum in the groundwater. ORC Advanced pellets (REGENESIS®) are designed for use in excavations and were spread by hand in lifts as the backfill was placed and compacted. Pellets were spread evenly in 1-foot lifts across the northeast and northwest corner of the excavation area both horizontally and vertically, as the excavation was backfilled. In the northwest area about 39 pounds (lbs) of pellets were applied per one foot lift (a total of 276 lbs placed). In the northeast area about 110 lbs of pellets were applied per lift (a total of 771 lbs placed). Pellets were placed from 8 to 15 ft below ground surface.

In the northeast corner, lagging from the shoring wall was removed during backfill in the area of ORC application, shown on as-built Drawing C-3. In the northwest corner, a trench box was used in place of lagging, and removed during backfilling.

Confirmation Samples

Excavation confirmation sampling was conducted per the Compliance Monitoring Plan as previously described. Table 7 summarizes the sample results and Figure A-2 shows sample locations. All soil samples collected from the final excavated extent of CAA-2.b were below the RELs.

Contaminated soils at CAA-2.b were excavated to approximately 15-ft bgs. Confirmation floor samples were collected following excavation, as illustrated on Figure A-2 (Appendix A-1). No sidewall samples were collected as they were adjacent to shoring or the ISS treatment area (CAA-2.a) and existing data was utilized to define the extent of the excavation (see Figure A-2, Appendix A-1). Soil samples from CAA-2.b were analyzed for DRO and ORO by Ecology Method NWTPH-Dx, and GRO by Ecology Method NWTPH-Gx.

Deviations from Design

The addition of ORC Advanced amendments in the northwest corner of CAA-2.b was incorporated into the design during construction to enhance biodegradation of any remaining petroleum in the groundwater.

No other deviations from the design occurred for this construction element at CAA-2b.

Table 7 Confirmation Soil Sample Results - CAA-2.b
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	REL (mg/kg)
CAA2B-BASE-01	10/11/2021	15	Base	Gasoline-range organics	54		5,000
	10/11/2021	15	Base	Total DRO & ORO	250		12,000
CAA2B-BASE-02	10/6/2021	15	Base	Gasoline-range organics	570	J	5,000
	10/6/2021	15	Base	Total DRO & ORO	1,700		12,000
CAA2B-BASE-03	10/6/2021	15	Base	Gasoline-range organics	48		5,000
	10/6/2021	15	Base	Total DRO & ORO	120		12,000
CAA2B-BASE-04	10/4/2021	15	Base	Gasoline-range organics	2,100		5,000
	10/4/2021	15	Base	Total DRO & ORO	11,000	J	12,000
CAA2B-BASE-04-0.5	10/4/2021	15.5	Information, See Note 1	Gasoline-range organics	410		5,000
	10/4/2021	15.5		Total DRO & ORO	3,400		12,000

Notes:
CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
LNAPL = Light non-aqueous phase liquid
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level
U = Analytes is not detected at the associated reporting limit.
J = Estimated concentration, laboratory recovery fell outside of control limits (high) due to sample matrix effects
Note 1 - Two base samples were collected at CAA2B-BASE-04, one at target depth (15 ft bgs) and one 0.5 deeper (15.5 ft bgs). The sample at 15.5 was collected for information only. Both sample results were below the REL.

2.9.3 CAA-3

A total of 1,428 tons of contaminated soil were excavated and disposed of off-site from CAA-3, to remove GRO and Total DRO+ORO at concentrations greater than the RELs. Removal of this soil also removed collocated benzene and TCE concentrations in this CAA. Soils were excavated as shown on as-built Drawing C-4 using standard excavation means and methods. The final excavation limits (horizontal and vertical), grades, and profiles are consistent with what is shown on the EDR Drawings.

Confirmation Samples

Excavation confirmation sampling was conducted per the Compliance Monitoring Plan as previously described. Table 8 summarizes the sample results and Figure A-3 (Appendix A-1) shows sample locations. All soil samples collected from the final excavated extent of CAA-3 were below the RELs.

Soil samples from CAA-3 were analyzed for DRO and ORO by Ecology Method NWTPH-Dx, and GRO by Ecology Method NWTPH-Gx and select sample locations from the southern portion of CAA-3 (i.e., CAA3-SS-03, CAA3-SS-04, and CAA3-BASE-03) were analyzed for Trichloroethene (TCE) by EPA Method 8260. These confirmation sample locations were selected for TCE analysis in addition to GRO and Total DRO+ORO since they are adjacent to the location of historical TCE detections in soil greater than the REL.

Deviations from Design

No other deviations from the design occurred for this construction element at CAA-3.

Table 8 Confirmation Soil Sample Results - CAA-3
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	REL (mg/kg)
CAA3-BASE-01	11/10/2021	5	Base	Gasoline-range organics	66		5,000
	11/10/2021	5	Base	Total DRO & ORO	170		12,000
CAA3-BASE-02	11/10/2021	5	Base	Gasoline-range organics	130		5,000
	11/10/2021	5	Base	Total DRO & ORO	370		12,000
CAA3-BASE-03	11/9/2021	5	Base	Gasoline-range organics	5	U	5,000
	11/9/2021	5	Base	Trichloroethene	0.02	U	1
	11/9/2021	5	Base	Total DRO & ORO	250	U	12,000
CAA3-SS-01	11/10/2021	4	Sidewall	Gasoline-range organics	10		5,000
	11/10/2021	4	Sidewall	Total DRO & ORO	250	U	12,000
CAA3-SS-02	11/10/2021	4.5	Sidewall	Gasoline-range organics	220		5,000
	11/10/2021	4.5	Sidewall	Total DRO & ORO	92		12,000
CAA3-SS-03	11/9/2021	4	Sidewall	Gasoline-range organics	270		5,000
	11/9/2021	4	Sidewall	Trichloroethene	0.02	U	1
	11/9/2021	4	Sidewall	Total DRO & ORO	250	U	12,000
CAA3-SS-04	11/9/2021	7	Sidewall	Gasoline-range organics	21		5,000
	11/9/2021	7	Sidewall	Trichloroethene	0.02	U	1
	11/9/2021	7	Sidewall	Total DRO & ORO	67	x	12,000

Notes:
CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level
U = Analytes is not detected at the associated reporting limit.
x = The sample chromatographic pattern does not resemble the fuel standard used for quantitation
Note 1: Trichloroethene was only analyzed at select locations as noted on SAP figure G-4 from the EDR.

2.9.4 CAA-5

A total of 361 tons of contaminated soil were excavated and disposed of off-site from CAA-5, to remove DRO+ORO and arsenic at concentrations greater than the CULs. Soils were excavated as shown on as-built Drawing C-4, using standard excavation means and methods. The final excavation limits (horizontal and vertical), grades, and profiles are consistent with what is shown on the EDR Drawings.

Confirmation Samples

Excavation confirmation sampling was conducted per the Compliance Monitoring Plan as previously described. Soil samples from CAA-5 were analyzed for DRO and ORO by Ecology Method NWTPH-Dx, and for arsenic by USEPA Method SW846-6010. Table 9 summarizes the sample results and Figure A-4 (Appendix A-1) shows sample locations.

All soil samples collected from the final excavated extent of CAA-5 were below the CUL for arsenic and REL for DRO+ORO. Existing samples (MW-03, see EDR Figure G-5) from this area indicate that arsenic may remain at concentrations slightly above the CUL between 5-7 feet below original ground surface, maximum concentrations of 9.8 mg/kg. The extent of excavation in this CAA is based on RELs as this area will include a pavement cap and institutional controls which reduce risk of direct contact with contaminated soil (CULs are based on direct contact exposure).

Deviations from Design

No deviations from the design occurred for this construction element at CAA-5.

Table 9 Confirmation Soil Sample Results - CAA-5
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	CUL (mg/kg)	REL (mg/kg)
CAA5-SS-01	8/3/2021	3.75	Sidewall	Arsenic	5.26		7.3	NA
	8/3/2021	3.75	Sidewall	Total DRO & ORO	5200		2,000	12,000
CAA5-SS-02	8/2/2021	4	Sidewall	Arsenic	5.63		7.3	NA
	8/2/2021	4	Sidewall	Total DRO & ORO	250	U	2,000	12,000
CAA5-SS-03	8/2/2021	3	Sidewall	Arsenic	6.36		7.3	NA
	8/2/2021	3	Sidewall	Total DRO & ORO	250	U	2,000	12,000
CAA5-SS-04	8/3/2021	3.75	Sidewall	Arsenic	4.08		7.3	NA
	8/3/2021	3.75	Sidewall	Total DRO & ORO	250	U	2,000	12,000

Notes:
CAA = Cleanup Action Area
CUL = Cleaup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level
U = Analytes is not detected at the associated reporting limit.

2.9.5 CAA-6

A total of 3,195 tons of contaminated soil were excavated and disposed of off-site from CAA-6.a and -6.b, including 2,627.6 tons from CAA-6.a and 567.6 tons from CAA-6.b to remove GRO, Total DRO+ORO, and benzene at concentrations greater than the CULs. Soils from CAA-6.a and -6.b were excavated as shown on as-built Drawing C-5 using standard excavation means and methods. For CAA-6.a, the final excavation limits (horizontal and vertical), grades, and profiles were slightly larger than what is shown on the EDR Drawings. The excavation was expanded to the eastern side based on confirmation sample results. Along the western edge the presence of clean backfill from previous excavation work was encountered. These areas are noted on the as-built Drawing C-5.

During removal of the concrete pad from CAA-6.a, a floor drain/vault was discovered on July 20, 2021. The vault was opened and standing water was present, no visual staining or oily water was observed on the water or in the vault itself. The vault had 2 separate chambers with piping connecting the 2 chambers. During removal of the sump one additional steel pipe was identified which ran from the sump to the north end of the former building slab. The pipe came in at an upper point in the sump cavity. The location where the pipe exits the building slab on the north end was already broken off prior to the start of the remedial actions. There are no indications of staining on the concrete in the greater area. The sump contained water, organic-rich sediments and roots with no hydrocarbon odors, sheen or other indication of contamination.

The soils around the vault and the vault (and piping) were removed and disposed of with the excavated soils removed from CAA-6.a. During confirmation soil sampling, a soil sample was collected from just under the location of the former vault, CAA-6A-SS-02 (shown on Table 10). The sample contained GRO at a concentration that exceeded the cleanup level, so the area was over-excavated and extended to the east where a second sample was collected at CAA6A-SS-09, confirming that the exceedance had been removed. During excavation activities in CAA-6.a, two full 55-gallon drums were uncovered on July 26, 2021. The drums were intact with no apparent holes or leaks upon discovery; however, the drums were damaged by the excavator when they were pulled out of the excavation. The drums are consistent with site understanding of petroleum barrels associated with historic site operations. The drums and the soil around the drums were removed from the excavation, placed on plastic, inspected, and then disposed of with the other TPH impacted soils at the site. Photographic documentation of the vault and drums are included in Appendix B (see photos 23A, 23B, 24). Ecology was present on site when the vault was discovered and was also notified of the vault and piping on July 22 and 27, 2021 and the drums on July 29, 2021 in electronic communications sent by CRETE.

For CAA-6.b, the final excavation limits (horizontal and vertical), grades, and profiles are consistent with what is shown on the EDR Drawings with the exception of the southern portion which was excavated an additional 0.5-foot vertically based on confirmation samples. Excavation at CAA-6.b was completed to the Ordinary High Water (OHW) line

adjacent to Salmon Bay. Excavation work in CAA-6.b was conducted when the water level in the bay was below the OWH line, which minimized the amount of water that flowed into the excavation. As excavation was completed along the Salmon Bay side, the northern sidewall was stabilized using quarry spalls and rip-rap immediately after the excavation depth was achieved, which prevented failure of the northern excavation sidewall.

Confirmation Samples

Excavation confirmation sampling was conducted per the Compliance Monitoring Plan as previously described. Sidewall samples were not collected: 1) along walls that expose backfill from previous excavation activities (encountered in CAA-6.a), and 2) along the OHW mark (CAA-6.b).

Soil samples from CAA-6.a and 6.b were analyzed for DRO and ORO by Ecology Method NWTPH-Dx, GRO by Ecology Method NWTPH-Gx, and benzene by USEPA Method SW846-8021B.

Tables 10 and 11 summarize the sample results and Figures A-5 and A-6 (Appendix A-1) show sample locations. All soil samples collected from the final excavated extents of CAA-6.a and CAA-6.b were below the CULs.

Deviations from Design

Excavation sidewall samples from the northeast wall of CAA-6.a exceeded CULs and additional soil removal was completed along this portion to extend the excavation past the original design boundary. The floor of the southern portion of CAA-6.b was expanded and additional 0.5-foot based on confirmation samples. New confirmation sidewall and base (floor) samples were collected to confirm the excavation limits of both of these areas, shown on Figures A-5 and A-6 (Appendix A-1). As noted in Section 2.7, monitoring well 02MW20, which overlapped with the CAA-6.b excavation, was abandoned on September 13, 2021. No other deviations from the design occurred for this construction element at CAA-6.

Table 10 Confirmation Soil Sample Results - CAA-6.a
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	CUL (mg/kg)
~~CAA6A-BASE-01/~~ CAA6A-BASE-01-4	~~7/29/2021~~	~~7.7~~	Base	Benzene	0.02	U	0.02
	~~7/29/2021~~	~~7.7~~	Base	Diesel-range organics	98		570
	~~7/29/2021~~	~~7.7~~	~~Base~~	~~Gasoline-range organics~~	~~40~~		~~30~~
	7/30/2021	8.1	Base, Replacement CAA6A-BASE-01	Gasoline-range organics	5	U	30
	~~7/29/2021~~	~~7.7~~	Base	Oil-range organics	250	U	1,600
	~~7/29/2021~~	~~7.7~~	Base	Total DRO & ORO	98		2,000
CAA6A-BASE-01-8	7/30/2021	8.5	Information, See Note 1	Gasoline-range organics	5	U	30
~~CAA6A-BASE-02~~	~~7/29/2021~~	~~8.6~~	~~Base~~	~~Benzene~~	~~0.038~~		~~0.02~~
	~~7/29/2021~~	~~8.6~~	Base	Diesel-range organics	50	U	570
	~~7/29/2021~~	~~8.6~~	Base	Gasoline-range organics	5	U	30
	~~7/29/2021~~	~~8.6~~	Base	Oil-range organics	250	U	1,600
	~~7/29/2021~~	~~8.6~~	Base	Total DRO & ORO	250	U	2,000
~~CAA6A-BASE-02A-5~~	~~7/30/2021~~	~~9~~	~~Base, replacement for CAA6A-BASE-02~~	~~Benzene~~	~~0.044~~		~~0.02~~
CAA6A-BASE-02A-8	7/30/2021	9.2	Base, replacement for CAA6A-BASE-02	Benzene	0.02	U	0.02
~~CAA6A-BASE-03/~~ CAA6A-BASE-03-4	~~7/29/2021~~	~~12.1~~	~~Base~~	~~Benzene~~	~~0.077~~		~~0.02~~
	7/30/2021	12.5	Base, replacement for CAA6A-BASE-03	Benzene	0.02	U	0.02
	~~7/29/2021~~	~~12.1~~	Base	Diesel-range organics	50	U	570
	~~7/29/2021~~	~~12.1~~	Base	Gasoline-range organics	5	U	30
	~~7/29/2021~~	~~12.1~~	Base	Oil-range organics	250	U	1,600
	~~7/29/2021~~	~~12.1~~	Base	Total DRO & ORO	250	U	2,000
CAA6A-BASE-03-8	7/30/2021	12.7	Information, See Note 1	Benzene	0.02	U	0.02
CAA6A-BASE-04	7/30/2021	14	Base	Benzene	0.02	U	0.02
	7/30/2021	14	Base	Diesel-range organics	50	U	570
	7/30/2021	14	Base	Gasoline-range organics	5	U	30
	7/30/2021	14	Base	Oil-range organics	250	U	1,600
	7/30/2021	14	Base	Total DRO & ORO	250	U	2,000
CAA6A-SS-01	7/28/2021	4	Sidewall	Benzene	0.02	U	0.02
	7/28/2021	4	Sidewall	Diesel-range organics	50	U	570
	7/28/2021	4	Sidewall	Gasoline-range organics	5	U	30
	7/28/2021	4	Sidewall	Oil-range organics	250	U	1,600
	7/28/2021	4	Sidewall	Total DRO & ORO	250	U	2,000
~~CAA6A-SS-02/~~CAA6A-SS-09	~~7/27/2021~~	~~2.5~~	Sidewall	Benzene	0.02	UJ	0.02
	~~7/27/2021~~	~~2.5~~	Sidewall	Diesel-range organics	510		570
	~~7/27/2021~~	~~2.5~~	Sidewall	~~Gasoline-range organics~~	~~130~~		~~30~~
	7/28/2021	3.7	Sidewall, Replacement CAA6A-SS-02, See Note 2	Gasoline-range organics	5	U	30
	~~7/27/2021~~	~~2.5~~	Sidewall	Oil-range organics	380		1,600
	~~7/27/2021~~	~~2.5~~	Sidewall	Total DRO & ORO	890		2,000
CAA6A-SS-03	7/27/2021	3	Sidewall	Benzene	0.02	U	0.02
	7/27/2021	3	Sidewall	Diesel-range organics	50	U	570
	7/27/2021	3	Sidewall	Gasoline-range organics	5	U	30
	7/27/2021	3	Sidewall	Oil-range organics	250	U	1,600
	7/27/2021	3	Sidewall	Total DRO & ORO	250	U	2,000
CAA6A-SS-04	7/27/2021	5	Sidewall	Benzene	0.02	U	0.02
	7/27/2021	5	Sidewall	Diesel-range organics	50	U	570
	7/27/2021	5	Sidewall	Gasoline-range organics	5	U	30
	7/27/2021	5	Sidewall	Oil-range organics	250	U	1,600
	7/27/2021	5	Sidewall	Total DRO & ORO	250	U	2,000
	7/28/2021	10.7	Sidewall	Benzene	0.02	U	0.02
	7/28/2021	10.7	Sidewall	Diesel-range organics	50	U	570

Table 10 Confirmation Soil Sample Results - CAA-6.a
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	CUL (mg/kg)
CAA6A-SS-05	7/28/2021	10.7	Sidewall	Gasoline-range organics	5	U	30
	7/28/2021	10.7	Sidewall	Oil-range organics	250	U	1,600
	7/28/2021	10.7	Sidewall	Total DRO & ORO	250	U	2,000
CAA6A-SS-06	7/29/2021	12.3	Sidewall	Benzene	0.02	U	0.02
	7/29/2021	12.3	Sidewall	Diesel-range organics	50	U	570
	7/29/2021	12.3	Sidewall	Gasoline-range organics	5	U	30
	7/29/2021	12.3	Sidewall	Oil-range organics	250	U	1,600
	7/29/2021	12.3	Sidewall	Total DRO & ORO	250	U	2,000
CAA6A-SS-07	7/30/2021	10.5	Sidewall	Benzene	0.02	U	0.02
	7/30/2021	10.5	Sidewall	Diesel-range organics	50	U	570
	7/30/2021	10.5	Sidewall	Gasoline-range organics	5	U	30
	7/30/2021	10.5	Sidewall	Oil-range organics	250	U	1,600
	7/30/2021	10.5	Sidewall	Total DRO & ORO	250	U	2,000
CAA6A-SS-08	7/30/2021	9.8	Sidewall	Benzene	0.02	U	0.02
	7/30/2021	9.8	Sidewall	Diesel-range organics	50	U	570
	7/30/2021	9.8	Sidewall	Gasoline-range organics	5	U	30
	7/30/2021	9.8	Sidewall	Oil-range organics	250	U	1,600
	7/30/2021	9.8	Sidewall	Total DRO & ORO	250	U	2,000

Notes:

Sample results greater than CUL.

~~CAA-6a~~ Sample represents a location that was over excavated, soil was removed and disposed of off-site

CAA = Cleanup Action Area
CUL = Cleaup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
U = Analytes is not detected at the associated reporting limit.
J = Estimated concentration, laboratory recovery fell outside of control limits (high) due to sample matrix effects

Note 1 - Two replacement base samples were collected at this location, one at 4 inches deeper and one 8 inches deeper. The sample result from the 4 inches deeper sample is used for confirmation, the sample collected 8 inches deeper was collected for information only.
Note 2 - During confirmation soil sampling, a soil sample was collected from just under the location of the former vault, CAA-6A-SS-02. The sample contained GRO at a concentration that exceeded the cleanup level, so the area was over-excavated and extended to the east where a second sample was collected at CAA6A-SS-09, confirming that the exceedance had been removed.

Table 11 Confirmation Soil Sample Results - CAA-6.b
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	CUL (mg/kg)
~~CAA6B-BASE-01~~/CAA6B-BASE-02	~~9/13/2021~~	~~4.5~~	~~Base~~	~~Benzene~~	~~0.02~~	~~U~~	~~0.02~~
	~~9/13/2021~~	~~4.5~~	~~Base~~	~~Gasoline-range organics~~	~~91~~		~~30~~
	9/13/2021	4.9	Base, replacement CAA6B-BASE-01	Gasoline-range organics	24		30
	~~9/13/2021~~	~~4.5~~	~~Base~~	~~Diesel-range organics~~	~~290~~	~~x~~	~~570~~
	~~9/13/2021~~	~~4.5~~	~~Base~~	~~Oil-range organics~~	~~250~~	~~U~~	~~1600~~
	~~9/13/2021~~	~~4.5~~	~~Base~~	~~Total DRO & ORO~~	~~290~~	~~x~~	~~2000~~
CAA6B-SS-01	9/13/2021	3.4	Sidewall	Benzene	0.02	U	0.02
	9/13/2021	3.4	Sidewall	Gasoline-range organics	5	U	30
	9/13/2021	3.4	Sidewall	Diesel-range organics	50	U	570
	9/13/2021	3.4	Sidewall	Oil-range organics	250	U	1600
	9/13/2021	3.4	Sidewall	Total DRO & ORO	250	U	2000
CAA6B-SS-02	9/13/2021	3.7	Sidewall	Benzene	0.02	U	0.02
	9/13/2021	3.7	Sidewall	Gasoline-range organics	5	U	30
	9/13/2021	3.7	Sidewall	Diesel-range organics	50	U	570
	9/13/2021	3.7	Sidewall	Oil-range organics	250	U	1600
	9/13/2021	3.7	Sidewall	Total DRO & ORO	250	U	2000

Notes:

Sample results greater than CUL.

~~CAA-6a~~ Sample represents a location that was over excavated, soil was removed and disposed of off-site

CAA = Cleanup Action Area

CUL = Cleaup level

DRO = Diesel-range organics

ft bgs = Feet below ground surface

GRO = Gasoline-range organics

mg/kg = Milligrams per kilogram

ORO= Oil-range organics

U = Analytes is not detected at the associated reporting limit.

x = The sample chromatographic pattern does not resemble the fuel standard used for quantitation

2.9.6 CAA-7

A total of 823 tons of contaminated soil were excavated and disposed of off-site from CAA-7, to remove arsenic at concentrations greater than the CULs. Soils were excavated as shown on as-built Drawing C-6, using standard excavation means and methods. The final excavation limits (horizontal and vertical), grades, and profiles are consistent with what is shown on the EDR Drawings.

A pile of concrete rubble and debris, which was observed on the northern portion CAA-7 and was generated during historical grading along the shoreline portion of this area, was pulled back and disposed of with the contaminated soils from CAA-7.

Confirmation Samples

Excavation confirmation sampling was conducted per the Compliance Monitoring Plan as previously described. Prior to the remediation work, extensive sampling and delineation of CAA-7 was completed as part of the Pre-Remedial Design Investigation (PRDI) work done in the fall and winter of 2020-2021. This work is detailed in the PRDI Summary Report which was included in Appendix B of the EDR (CRETE 2021).

Soil samples from CAA-7 were analyzed for arsenic by USEPA Method SW846-6020.

Table 12 summarizes the sample results and Figure A-7 (Appendix A-1) shows sample locations, including the PRDI sampling effort. The MTCA "three-part rule" defined in WAC 173-340-740(7)(d) and (e), was used to determine statistical compliance with the CUL in CAA-7. This approach requires that:

- The 95% upper confidence limit (UCL) on the sample mean may not exceed the soil CUL.
- No sample may exceed two times the CUL, except where modifications are allowed (as explained below).
- Less than 10% of the samples may exceed the CUL, except where modifications are allowed (as explained below).

For confirmation sampling within CAA-7, the CUL is based on natural background concentrations for arsenic. As such, the two requirements concerning sample exceedances within the statistical data set, as set forth in WAC 173-340-740(7)(e)(i) and (ii), may be modified as approved by Ecology to control false positive error rates at 5%. Specifically, the exceedance factor may be increased above 2 and the percentage of samples exceeding the CUL may be 10% or more, consistent with the procedures outlined the Statistical Guidance for Ecology Site Managers (Ecology 1992). Section 4.3.5 of the guidance document states that "for relatively small compliance monitoring sample sizes (n<30), not more than 20 percent of the samples should exceed a standard based on the 90th percentile background value."

For this project, Ecology determined that the acceptable percentage of samples exceeding the CUL based on the natural background concentration is 18% and accepted an exceedance factor of 2.84 (max concentration of 21 mg/kg). These values were determined based on the total number of samples in the statistical data set and the probability formulas provided in the guidance document[3]. Confirmation samples are shown on Table 12 and Table A-1 included in Appendix A provides details on statistical analysis completed on the data set. A total of 45 soil samples were used for the confirmation data set, of those, 6 samples (13%) exceed the CUL, which is less than 18%. The maximum value detected of those 6 samples is 13.6 mg/kg, which is less than the allowable exceedance factor of 2.8x (i.e., less than 21 mg/kg).

The data set has a 95% UCL of 6.1 using a gamma distribution in ProUCL[4], details of the UCL analysis is provided on Appendix A-1, Table A-2 and Table A-3. The data set 95% UCL of 6.1 is less than the CUL of 7.3 mg/kg.

The data set demonstrates that the CAA-7 soil removal action meets compliance with the arsenic CUL through statistical demonstration in accordance with WAC 173-340-740(7).

Deviations from Design

No other deviations from the design occurred for this construction element at CAA-7.

[3] Probability formulas for determining allowable exceedances are provided in Technical Attachment 1 (Allowable Frequency of Exceedance of Cleanup Standards Based on Background) and Technical Attachment 2 (Allowable Magnitude of Exceedance of Cleanup Standard Based on Background) to Figure 12 of the 1992 Statistical Guidance.

[4] USEPA. ProUCL: Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. Version 5.2. https://www.epa.gov/land-research/proucl-software, 2022

Table 12 Confirmation Soil Sample Results - CAA-7
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	CUL (mg/kg)	Notes
CAA7-B01-1.0-1.25	11/13/2020	Base	1.25	Arsenic	3.65		7.3	
CAA7-B02-1.0-1.25	11/13/2020	Base	1.25	Arsenic	5.7		7.3	
CAA7-B03-1.0-1.25	11/13/2020	Base	1.25	Arsenic	6.73		7.3	
CAA7-B04-2.0-2.25	11/13/2020	Base	2.25	Arsenic	6.01		7.3	
CAA7-B05-1.0-1.5	2/22/2021	Base	1.5	Arsenic	9.24		7.3	Note 1
CAA7-B06-1.0-1.5	2/22/2021	Base	1.5	Arsenic	7.9		7.3	Note 1
CAA7-B07-1.0-1.5	2/22/2021	Base	1.5	Arsenic	5.83		7.3	
CAA7-B08-1.0-1.5	2/22/2021	Base	1.5	Arsenic	4.85		7.3	
~~CAA7-B11-2.0-2.25~~	~~3/22/2021~~	~~Base~~	~~2.25~~	~~Arsenic~~	~~6.54~~		~~7.3~~	
~~CAA7-B12-2.0-2.25~~	~~3/22/2021~~	~~Base~~	~~2.25~~	~~Arsenic~~	~~5.8~~		~~7.3~~	
CAA7-BASE-13	7/19/2021	Base	1	Arsenic	6.24		7.3	
CAA7-BASE-14	7/19/2021	Base	1	Arsenic	6.71		7.3	
CAA7-BASE-15	7/19/2021	Base	1	Arsenic	3.79		7.3	
CAA7-BASE-16	7/19/2021	Base	1	Arsenic	3.06		7.3	
CAA7-BASE-17	7/19/2021	Base	1	Arsenic	5.66		7.3	
CAA7-BASE-18	7/19/2021	Base	2	Arsenic	6.85		7.3	
CAA7-BASE-19	7/19/2021	Base	0.5	Arsenic	6.98		7.3	
CAA7-SW11-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	3.63		7.3	
CAA7-SW11-0.5-1.0	2/22/2021	Base	1	Arsenic	4.93		7.3	
CAA7-SW12-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	3.99		7.3	
CAA7-SW12-0.5-1.0	2/22/2021	Base	1	Arsenic	4.01		7.3	
CAA7-SW13-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	2.24		7.3	
CAA7-SW13-0.5-1.0	2/22/2021	Base	1	Arsenic	2.04		7.3	
CAA7-SW14-0.5-1.0	2/22/2021	Base	1	Arsenic	6.02		7.3	
CAA7-SW15-1.0-1.5	2/22/2021	Base	1.5	Arsenic	7.82		7.3	Note 1
CAA7-SW18-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	5.4		7.3	
CAA7-SW20-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	5.01		7.3	
CAA7-SW21-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	4.42		7.3	
CAA7-SW23-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	10.8		7.3	Note 1
CAA7-SW24-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	13.3		7.3	Note 1
CAA7-SW25-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	6.39		7.3	
CAA7-SW26-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	13.6		7.3	Note 1
COMP-1c-0.5-1.0	11/13/2020	Base	1	Arsenic	6.41		7.3	
COMP-2a-0.5-1.0	11/13/2020	Base	1	Arsenic	3.54		7.3	
COMP-2b-0.5-1.0	11/13/2020	Base	1	Arsenic	2.07		7.3	
COMP-2c-0.5-1.0	11/13/2020	Base	1	Arsenic	4.16		7.3	
COMP-2d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.38		7.3	
COMP-3a-0.5-1.0	11/13/2020	Sidewall	1	Arsenic	4.59		7.3	
COMP-3b-0.5-1.0	11/13/2020	Sidewall	1	Arsenic	3.43		7.3	
COMP-3c-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.66		7.3	
COMP-3d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	3.75		7.3	
COMP-4c-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.74		7.3	
COMP-4d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	3.99		7.3	
COMP-5c-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.13		7.3	
COMP-5d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	5.69		7.3	
COMP-6a-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	5.77		7.3	
COMP-6d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	1.07		7.3	
~~COMP-7d-0.0-0.4~~	~~11/13/2020~~	~~Base~~	~~0.4~~	~~Arsenic~~	~~106~~		~~7.3~~	~~Note 1~~

Notes:

~~CAA-7~~ Sample represents a location that was over excavated, soil was removed and disposed of off-site

CAA = Cleanup Action Area

CUL = Cleaup level

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

U = Analytes is not detected at the associated reporting limit.

Note 1. Statistical compliance with the cleanup level, which is based on natural background concentrations, is demonstrated in accordance with WAC 173-340-740(7)(d) and (e), with adjustment to the allowable exceedance factor and the percentage of confirmation samples exceeding the cleanup level in accordance with Ecology statistical guidance for assessing compliance with natural background-based cleanup levels (Ecology 1992). Details are provided in the EDR.

2.9.7 Diesel Spill

A small diesel spill occurred on September 3, 2021 adjacent to the southeast edge of CAA-2.a when an empty haul truck clipped a concrete vault and punctured the fuel tank. The haul truck immediately stopped and spill response measures were deployed, which included the use of sorbent pads and bins/buckets to capture the leaking diesel fuel. CRETE staff were on site during the incident and recorded extents and details. It is estimated that less than 10 gallons of fuel was spilled onto the internal haul road just south of the CAA-2.a ISS treatment area. The entire spill area was confined to an area no larger than 6ft by 4ft and no fuel migrated outside of the property. CRETE provided a notice to Ecology (ERTS, tracking 21-3523) on September 3, 2021.

The area was isolated and protected from any water contact. All visual impacted soil was excavated on September 13, 2021. The excavation area was expanded (from the 6ft by 4ft spill area) to remove all soils in the vicinity with a final excavation footprint of 18ft by 10ft, with an excavation depth of approximately 3 feet bgs (shown on as-built Drawings C-1 [overall location] and C-4 [detailed removal area]). A total of 10 tons of soil were sent off-site for disposal at Roosevelt Regional Landfill. Table 13 summarizes the results of the soil samples collected of the excavated bottom; laboratory reports and waste disposal tickets are included in Appendix E and D, respectively. Samples were collected at the bottom of the exposed sidewalls (south sample ID, see As-built drawing C-4) and immediately downgradient of the spill (northeast sample ID, see As-built drawing C-4). Surface conditions in this area are sloped steeply, so excavation of this area resulted in the removal of the northeastern sidewalls (shown on photos 48 and 49 in Appendix B). Field screening during excavation activities, which included using a PID and visual methods, were used to verify the extent of the removal. As indicated in Table 13, the confirmation samples collected from the excavation extents did not contain detectable concentrations of DRO and ORO.

Table 13 Soil Sample Results Diesel Spill Area
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	REL (mg/kg)
Northeast	9/13/2021	2.4	Bottom	Total DRO & ORO	250	U	12,000
South	9/13/2021	3	Bottom	Total DRO & ORO	250	U	12,000

Notes:
DRO = Diesel-range organics
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level
U = Analytes is not detected at the associated reporting limit.

2.9.8 Backfill

Excavations were backfilled per the project specifications provided in the EDR. All backfill material was provided by CalPortland; copies of import tickets and laboratory import testing, including chemistry samples and grain size details, are included in Appendix F. Only materials with fines required analytical testing, which included the gravel borrow and the bedding sand (placed in the interceptor trench). Materials were provided from the following CalPortland quarries:

- Gravel Borrow, Quarry Spalls, Ballast Rock, and Sand:

  DuPont WA State Pit B-335
  4301 Pioneer Way
  DuPont, WA 98327

  Manke Family Resources Shelton Mine
  826 Fairmount Avenue
  Shelton, WA 98584

- Loose rip rap for CAA-6.b:

  White River Quarry
  31107 SE Enumclaw Chinook Pass
  Enumclaw, WA 98022

Quarry spalls were used to raise the grade above the water surface in excavations that extended below the water table and resulted in the accumulation of standing water. The backfill was compacted by tamping the surface with the excavator bucket over the entire area. A total of 1,594 tons of quarry spalls were placed in the remediation areas. For fill above the water table, in the vadose zone excavations were backfilled with gravel borrow or ballast rock. A total of 9,343 tons of gravel borrow and 7,750 tons of ballast rock was placed in remediation areas.

Gravel borrow was placed in 12-inch, successive, loose horizontal lifts and compacted using mechanical equipment to at least 95 percent of its maximum dry density in the top 2 feet, as determined by the American Society of Testing and Materials (ASTM) standard D-1557 (Modified Proctor). Below 2 feet, the gravel borrow was compacted to 90 percent of its maximum dry density. Verification of compaction testing is included in Appendix G. Ballast rock was also placed in 12-inch, successive, loose horizontal lifts and compacted using mechanical equipment to a firm and non yielding surface. Design drawings specified the use of gravel borrow above the water table which is a more economical material over ballast rock. Both materials perform in similar fashion and provide a solid compactable surface that can be used for future development. Schedule demands resulted in using more ballast rock than just the top 2 feet in select CAAs (CAA-5), noted in Table 14 below.

The upper 2 feet of select excavation areas were backfilled with ballast rock to the final surface elevation. In CAA-6.b, the area was raised to match the surrounding surface elevation and an additional layer of small diameter rip rap (max diameter ¼ ton which is roughly a diameter of about 1.5 feet) was placed above the OHW mark along CAA-6.b to provide additional protections from surface water inundation from Salmon Bay.

As-built Drawing C-11 shows the completed surfaces across the ASKO and Bulk Terminal parcels. Table 14 summarizes backfill material per soil removal CAAs.

Table 14 Summary of Backfill Activities

CAA Area	Subsurface Backfill (greater than 2 ft bgs)	Surface Material (2 ft bgs)
CAA-1	Quarry spalls and gravel borrow	Ballast rock to match surrounding grade (note a portion of this area is covered by the SMA as shown on as-built Drawing C-11)
CAA-2.b	Quarry spalls and gravel borrow	Paved asphalt surface which includes: 7” Hot Mix Asphalt (HMA) Class 1 and 2” of HMA class 1/2
CAA-3	Quarry spalls and gravel borrow	Ballast rock to match surrounding grade
CAA-5	Ballast rock	Ballast rock to match surrounding grade
CAA-6.a	Quarry spalls and gravel borrow	Ballast rock to match surrounding grade
CAA-6.b	Gravel borrow	Ballast rock and riprap, area was graded to match surrounding grade
CAA-7	No subsurface backfill, excavation was only 2 feet bgs.	Ballast rock to match surrounding grade

2.9.9 Data Quality Control

Appendix E includes the data validation report for the soil confirmation sampling effort. The analytical data were validated in accordance with the National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA 2020a) and/or National Functional Guidelines for Organic Superfund Methods Data Review (USEPA 2020b).

The analytical holding times were met for all sample delivery groups and the method blanks had no detections. The matrix spike/matrix spike duplicate (MS/MSD) and laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries and sample/sample duplicate, MS/MSD, and LCS/LCSD relative percent differences all met U.S. Environmental Protection Agency (USEPA) requirements. No qualifiers were added to the analytical results based on the data quality review. All data are determined to be of acceptable quality for use as reported by the laboratory, with some laboratory qualifiers being updated to conform to the final qualifiers used for data table reporting and database storage.

2.10 Construction - In Situ Solidification

ISS mixing was completed in CAA-2.a and CAA-4.a and CAA-4.b to the extents shown on as-built Drawings C-7 and C-8. Prior to starting the full ISS mixing in each CAA the Contractor completed test grid cells to refine the mixing means and methods and ISS reagent ratios. Two test cells were completed from CAA-2.a, prior to full scale mixing (cells 2-36 and 2-42). These test cells became part of the final ISS footprint. Test cells were not completed at CAA-4 because CAA-4 mixing occurred after CAA-2.a mixing was completed, and the data collected during the CAA-2.a mixing was used instead of test cells. This was a deviation from the design documents, but determined to be acceptable since 47 cells were completed from CAA-2.a prior to starting mixing at CAA-4. ISS reagents included:

- Granular Blast Furnace Slag (GBFS) Grade 100 in accordance with ASTM C989,
- Cement type 1 in accordance with ASTM C150, and
- Water provided by the City of Seattle through a fire hydrant connection.

Reagents were mixed in a self-contained grout plant, which was constructed on site and included two internal colloidal mixer tanks which allowed all ratios to be mixed by weight to determine the accurate amount of each reagent needed. Once a batch was fully mixed, it was pumped through piping to the active ISS working cell or area and mixed with a large excavator in place. Based on bench scale testing and the test cell data, an ISS mix of about 2.5% Portland cement and 4.5% GBFS was used during the ISS work through September 22, 2021 and then the ratios were adjusted slightly based on the very high unconfined compression strength (UCS) and permeability results, to 1.5% Portland cement and 4.5% GBFS thereafter. During surface grading of swell material at CAA-4, additional Portland cement and GBFS were added to the surface soils to stabilize the top approximately 3 feet of soils since the surface was inundated by heavy rains in late October and early November, resulting in a soft surface. Approximately 96 tons of material (48 tons of Portland cement and 48 tons of GBFS) was added to CAA-4 between November 15 and 20, 2021.

Approximately 9,500 cubic yards of soils were mixed and treated from CAA-2.a and approximately 18,400 cubic yards of soils from CAA-4 were mixed and treated. Due to the added volume of grout and the mixing process, swell material was generated during ISS mixing, resulting in an approximate 30 percent increase in the total ISS volume (due to bulking). To accommodate this added volume, a swell management area (SMA) was created in the southeastern corner of the property, shown on Figure 3 and as-built Drawing C-9 (Appendix A-2). Approximately 5,500 cubic yards of swell material was moved from CAA-2.a and CAA-4 and placed in this area. This was excess volume that could not be accommodated within the CAA footprints. Excess in-situ mixed soils were transported from CAA-2 and CAA-4 to the SMA, and spread out in lifts and compacted after the soils were fully stabilized through mixing. In some cases, untreated soils were transported to the SMA and mixed within the SMA, within bermed areas and on top of previously treated soils. For soils that were mixed within the SMA, the same mixing protocols used in CAA-2 and CAA-4 were implemented. This practice resulted in monolithic hardening of the swell material, avoiding the need for placement and compaction in lifts. The final surface of the SMA is shown on as-built Drawing C-9.

During surface grading at the SMA additional Portland cement and GBFS were added to the surface soils to stabilize the top 1-2 feet of soils. Similar to CAA-4, the surface was inundated by heavy rains in late October and early November which resulted in a soft surface. Approximately 48 tons of material was added to the SMA area on December 1 through December 10, 2021.

ISS mixing was completed in grid cells which represent a mixing volume that could be mixed in a short period of time (less than a day, which was a smaller grid cell volume than what was specified in the EDR – see the discussion in the deviations section below). The bottom elevation (i.e., mixed elevation) of each cell was determined based on the estimated elevation of the silt layer for a given cell, with cells along the perimeter extending one foot below the silt layer (creating a key to lock the ISS monolith into the silt unit). The final mixed elevations for each cell and the elevation of the silt layer are noted on the as-built Drawings C-7 and C-8.

Confirmation Samples

ISS performance testing was conducted on ISS perimeter grid cells and ISS interior grid cells per the Compliance Monitoring Plan (CRETE 2021). Sample results are summarized on Table 15 and copies of laboratory test reports are included in Appendix I.

ISS samples were collected at varying, randomly selected, mixing elevations in the compliance grid cell, determined by the Engineer the day of mixing. Sampling was completed within 4 hours of mixing completion, while the ISS mix was sufficiently flowable to prepare core samples. Each sample was collected using a sample collection tool attached to the excavator, and material from the sampler was placed directly into a 5-gallon bucket using a small shovel or other hand tools as appropriate. The ISS performance samples were transported to the ISS testing laboratory (Timely Engineering Soil Tests).

The final compliance grid network was adjusted in the field from the EDR Drawings to facilitate mixing of smaller grid cells that could be worked within one shift. This resulted in more grid cells and often more than one mixing cell was completed during a shift. One sample was collected per mixing day to determine the effectiveness of the mixing methods and slurry blend used during that day. Samples were collected from ISS perimeter and interior grid cells and included the following performance standards:

- All ISS perimeter and interior grid cells from CAA-2.a and CAA-4, with the exception of three interior grid cells from CAA-4 (and 3 associated interior grid cells mixed on the same days), achieved the following performance standards for all samples tested (shown on Table 15):
    - Hydraulic Conductivity less than $1x10^{-6}$ centimeter per second (cm/sec) and unconfined compressive strength (UCS; 28 days) greater than 50 psi.
- The three interior grid cells sampled (mixing cells 4-42, 4-32, and 4-31) and the three interior grid cells mixed on the same days (4-40, 4-30, and 4-41) of CAA-4 that did not achieve the above performance standard represent approximately 10 percent of the ISS mixing cells from CAA-4. Per the project requirements in EDR Drawing No. G-5, up to 10% of interior ISS mixing cells may fail the criteria above, so long as each grid cell achieves the following performance standard:
    - Hydraulic Conductivity no greater than 10^{-5} cm/s and a UCS no less than 30 psi. These six interior cells, represented by samples 4-31, 4-32, and 4-42, all have a hydraulic conductivity of 10^{-6} cm/s and a UCS greater than 30 psi (sample 4-32 had a UCS of 35 psi, while the other two samples had a UCS greater than 50 psi). Typical performance criteria for ISS projects is set at 10^{-5} to 10^{-6} cm/sec (Bates & Hills 2015). The three sample results from 4-31, 4-32, and 4-42 are within the typical range. ISS guidance documents also acknowledge that variability results for performance criteria can occur, with some failure of performance criteria, but as long as that failure is within the interior of the monolith and contained by the perimeter, it is generally acceptable.
        - The hydraulic conductivity for these three samples are just slightly under the performance goal as follows: Sample 4-42 = 0.0000055 cm/sec; Sample 4-32 = 0.0000059 cm/sec; Sample 4-31 = 0.0000017 cm/sec with a performance goal less than 0.000001 cm/sec
        - These interior cells are surrounded by cells that have achieved the performance goals at 28 days; these 6 cells represent a very small volume of the total area mixed (9.5% [1748 cubic yards]).
        - The contractor collected 2 samples from CAA-4 which were sampled at 28 and 42 days. These samples show decreases in hydraulic

conductivity between days 28 and 42 days. Using the average factor of reduction (4.3) observed at these samples applied to the 3 samples (mixing cells 4-42, 4-32, and 4-31), the 42 day samples are projected to meet the performance goal. This information is included in Appendix I. Additionally, the consistent reduction in the permeability for all samples with time series data (39 samples total) strongly suggests that the samples in question have achieved performance requirements by now.

  - USAEPA guidance recommends at least 2 orders of magnitude reduction in hydraulic conductively below that of the surrounding site soils (USEPA 1989). Results of seven slug tests from site monitoring wells in the Shallow WBZ are reported in the RIFS (Floyd Snider 2020) to range from 2 to 5.7 ft/day; which is 0.0007 to 0.002 cm/sec. The average is 3.85 ft/day or 0.001 cm/sec. The highest hydraulic conductively value measured from 28-day samples collected at CAA-4 (Sample 4-32 = 0.0000059 cm/sec) is 2 orders of magnitude lower than 3.85 ft/day, which would be 0.00001 cm/sec.

- Based on these results, the performance of the ISS monolith at CAA-4 is not anticipated to be adversely affected since the interior cells are surrounded by perimeter grid cells, essentially creating a collar to isolate and contain the stabilized interior soil.
- At a few locations, the contractor elected to remix certain ISS cells based on visual observations of the material properties. Subsequent sampling and testing of these cells confirmed compliance with performance standards.
- For untreated soils that were mixed at the SMA, ex-situ samples were collected to verify performance standards were met in the SMA. Samples were collected on days that mixing was completed, prior to spreading and compacting the mixed SMA material. One soil pile was mixed at CAA-4 prior to transporting it over the SMA, a sample of that pile (CAA-4-SP) was also collected after mixing prior to spreading and compacting the material. These samples are shown on Table 15 and noted with an 'ex-situ' sample ID. All of these sample results exceeded the minimum performance standards for exterior cells (i.e., all Hydraulic Conductivity values are less than $1x10^{-6}$ cm/sec and the unconfined compressive strength (UCS; 28 days) is greater than 50 psi). Preliminary data from the laboratory for the ex-situ sample from 4-73, which represents the SMA area, indicated that design parameters would not be achieved. The Contractor terminated testing for that area, re-mixed the area, and re-sampled the finished cell. The re-mixed sample is presented in Table 15 as 4-73-remix.

Deviations from Design

As stated above, the final compliance grid network was adjusted from the EDR Drawings to represent smaller grid cells that could be worked easily within one shift. The total mixing depths were also adjusted based on the smaller grid cell size. The mixing depth is based on the top of the silt and was verified in the field during mixing. When the top of the silt was encountered, excavation and mixing required significantly greater effort, often accompanied by evidence of dense silt soils in the excavation bucket. As-built Drawings C-7 and C-8 show the final grid cell mixing pattern for each ISS area.

Design drawings indicated that two test cells would be completed form each CAA. It was assumed that ISS mixing would be concurrent at each CAA, actual work was conducted in a phased approach, starting at CAA-2a and then moving to CAA-4. Because of this only two test cells were completed at CAA-2 prior to the starting the full scale mixing (cells 2-36 and 2-42). The information from these test cells and the 45 completed mixing cells in CAA-2a (as-built Drawing C-7, a total of 47 cells were mixed in CAA-2a, including 2 test cells and 45 mixing cells) was used to inform and refine the mixing plan for CAA-4. No additional test cells were conducted at CAA-4.

Section 5.4.2.2 of the EDR indicated that ISS cells were intended to represent a work shift and that the contractor would determine the ISS cell layout. The contractor divided the ISS cells into smaller, more workable cells compared to the larger ISS cells that were conceptually presented in the EDR; therefore, approximately two to three smaller ISS cells were completed on any given day. The intent of the performance criteria established in the EDR was to collect one sample per work shift, which is typical for ISS mixing, since the amendments are mixed in a batch plant at the start of the shift and the soils are consistent within the working area. As such, one ISS performance sample was collected each day of ISS mixing for analysis of hydraulic conductivity and UCS, instead of collecting one sample per cell, and the performance sample results were applied to all grids mixed on the same day (see Table 15).

ISS test results from 4-31, 4-32, and 4-42 all had hydraulic conductivities slightly shy of the performance standard. Though these results were just shy of the performance standard (discussed above), they were accepted because the data was within typical ISS performance thresholds, the resulting hydraulic conductivities were more than 2 order of magnitudes lower than the hydraulic conductivity of the surrounding soil, and they are completely surrounded by areas that achieved the design standards. Additional data collected during remedial action activities also suggest that the hydraulic conductivity will continue to decrease as the concrete fully cures.

As previously noted, the contractor transferred some untreated soils from CAA-4 to the SMA and mixed them in place, using the same mixing methods as in CAA-2.a and CAA-4, essentially making shallow ISS grid cells. This allowed for the soils to be fully mixed within the limits of the SMA and allowed for the soils to cure in place, minimizing handling and potential contaminant migration. Samples of these “ex-situ-mixed” soils were collected in

the SMA as indicated in Table 15. Ex-situ mixed soils in the SMA were held to the same performance standards as the CAA-2.a and CAA-4.

No other deviations from the design occurred for this construction element.

Table 15 Confirmation ISS Results
Time Oil Terminal, Seattle WA

CAA Area	Sample Cell #	Same-Day Related Cell	Cell Completed Date	Sampled Date	Sample Depth (ft. BGS)	UCS (≥50 psi)	HYDRAULIC CONDUCTIVITY (<1X10^{-6} cm/sec)
						28-DAY	28-DAY
CAA-2	2-42	C-42 - Test Cell	8/18/21	8/18/21	14.74	224	1.6E-07
	2-36 [1]	2-36 - Test Cell	8/19/21	9/2/21	15.86	NA	NA
	2-23	2-23	8/20/21	8/20/21	10	455	1.8E-07
	2-15	2-15	8/23/21	8/23/21	13.3	358	1.2E-07
	2-40	2-40	8/24/21	8/24/21	13	297	1.3E-07
		2-30	8/24/21	NA	NA	NA	NA
	2-45	2-45	8/25/21	8/25/21	16.3	331	1.2E-07
		2-11	8/25/21	NA	NA	NA	NA
	2-7	2-7	8/26/21	8/26/21	17.7	484	1.5E-07
	2-1	2-1	8/30/21	8/30/21	18.9	137	3.0E-07
	2-43	2-43	8/31/21	8/31/21	11.3	316	5.0E-08
		2-37	8/31/21	NA	NA	NA	NA
	2-41	2-41	9/1/21	9/1/21	17.75	327	1.5E-07
		2-31	9/1/21	NA	NA	NA	NA
	2-4	2-4	9/2/21	9/2/21	20	88	6.6E-07
		2-36 re-mix [1]	9/2/21	9/2/21	16.42	374	5.2E-07
	2-46	2-46	9/3/21	9/3/21	18.7	217	2.1E-07
	2-47	2-47	9/7/21	9/7/21	18.5	170	3.4E-07
		2-38	9/7/21	NA	NA	NA	NA
		2-24	9/7/21	NA	NA	NA	NA
	2-24	2-24	9/8/21	9/8/21	17	393	9.6E-07
	2-32	2-32	9/9/21	9/9/21	13.5	412	8.7E-08
		2-44	9/9/21	NA	NA	NA	NA
	2-32 [2]	2-32	9/10/21	9/10/21	20	162	8.1E-07
		2-25	9/10/21	NA	NA	NA	NA
	2-25	2-25	9/11/21	9/11/21	12.5	371	5.2E-08
	2-16	2-16	9/13/21	9/13/21	20	373	4.9E-08
	2-2	2-2	9/14/21	9/14/21	17.6	307	1.1E-07
	2-17	2-17	9/15/21	9/15/21	16.5	367	1.5E-07
		2-8	9/15/21	NA	NA	NA	NA
		2-39	9/15/21	NA	NA	NA	NA
	2-5	2-5	9/16/21	9/16/21	12	452	1.2E-07
		2-12	9/16/21	NA	NA	NA	NA
	2-9	2-9	9/17/21	9/17/21	15.5	319	8.0E-08
		2-3	9/17/21	NA	NA	NA	NA
	2-33	2-33	9/21/21	9/21/21	20	539	3.6E-07
		2-6	9/21/21	NA	NA	NA	NA
	2-13	2-13	9/22/21	9/22/21	20	374	1.3E-07
		2-26	9/22/21	NA	NA	NA	NA
	2-10	2-10	9/23/21	9/23/21	7.6	199	2.2E-07
		2-26	9/23/21	NA	NA	NA	NA
		2-18	9/23/21	NA	NA	NA	NA
	2-22	2-22 East Half	9/24/21	9/24/21	19.5	208	9.2E-08
		2-22 West Half	9/24/21	NA	NA	NA	NA
		2-14	9/24/21	NA	NA	NA	NA
	2-21 East	2-21 East	9/25/21	9/25/21	15.3	230	2.6E-07
		2-21 Center	9/25/21	NA	NA	NA	NA
		2-21 West	9/25/21	NA	NA	NA	NA
	2-20 East	2-20 East	9/27/21	9/27/21	18	393	1.7E-07
		2-20 West	9/27/21	NA	NA	NA	NA
		2-19	9/27/21	NA	NA	NA	NA
		2-29	9/27/21	NA	NA	NA	NA
		2-35	9/27/21	NA	NA	NA	NA
	2-27	2-27	9/28/21	9/28/21	17	450	3.0E-07
		2-28	9/28/21	NA	NA	NA	NA
		2-34	9/28/21	NA	NA	NA	NA
CAA-4	4-9	4-9	10/2/21	10/2/21	20	132	2.8E-07
		4-13	10/2/21	NA	NA	NA	NA
	4-12	4-12	10/9/21	10/9/21	19	125	1.8E-07
		4-8	10/9/21	NA	NA	NA	NA
	4-2	4-2	10/11/21	10/11/21	18	75	6.4 E -07 [a]
		4-5	10/11/21	NA	NA	NA	NA
	4-7	4-7	10/12/21	10/12/21	18	66	9.3E-07
		4-3	10/12/21	NA	NA	NA	NA
		4-10	10/12/21	NA	NA	NA	NA
		4-61	10/12/21	NA	NA	NA	NA
		4-62	10/12/21	NA	NA	NA	NA
	4-1	4-1	10/13/21	10/13/21	15	73 [a]	9.8 E -07 [a]
		4-56	10/13/21	NA	NA	NA	NA
		4-49	10/13/21	NA	NA	NA	NA
	continues to next page						
		4-63	10/14/21	10/14/21	20	79	6.6E-07

Table 15 Confirmation ISS Results
Time Oil Terminal, Seattle WA

CAA Area	Sample Cell #	Same-Day Related Cell	Cell Completed Date	Sampled Date	Sample Depth (ft. BGS)	UCS (≥50 psi)	HYDRAULIC CONDUCTIVITY (<1X10^{-6} cm/sec)
						28-DAY	28-DAY
CAA-4	4-63	4-11	10/14/21	NA	NA	NA	NA
		4-6	10/14/21	NA	NA	NA	NA
	4-58	4-58	10/15/21	10/15/21	10	92	7.3E-07
		4-4	10/15/21	NA	NA	NA	NA
		4-14	10/15/21	NA	NA	NA	NA
		4-59	10/15/21	NA	NA	NA	NA
	4-44	4-44	10/16/21	10/16/21	13	53	5.8E-07
		4-16	10/16/21	NA	NA	NA	NA
		4-18	10/16/21	NA	NA	NA	NA
		4-47	10/16/21	NA	NA	NA	NA
	4-60	4-60	10/18/21	10/18/21	20	77	1.7E-07
		4-15	10/18/21	NA	NA	NA	NA
		4-52	10/18/21	NA	NA	NA	NA
	4-53	4-53	10/19/21	10/19/21	16.5	118	7.0E-07
		4-17	10/19/21	NA	NA	NA	NA
		4-19	10/19/21	NA	NA	NA	NA
	4-46	4-46	10/20/21	10/20/21	13	99	4.7E-07
		4-21	10/20/21	NA	NA	NA	NA
		4-23	10/20/21	NA	NA	NA	NA
		4-39	10/20/21	NA	NA	NA	NA
	4-20	4-20	10/21/21	10/21/21	20	230	1.9E-07
		4-48	10/21/21	NA	NA	NA	NA
		4-57	10/21/21	NA	NA	NA	NA
	4-22	4-22	10/22/21	10/22/21	18	336	2.0E-07
		4-50	10/22/21	NA	NA	NA	NA
	4-24	4-24	10/23/21	10/23/21	18	402	1.0E-07
		4-55	10/23/21	NA	NA	NA	NA
	4-26	4-26	10/25/21	10/25/21	20	341	2.7E-07
		4-28	10/25/21	NA	NA	NA	NA
		4-54	10/25/21	NA	NA	NA	NA
		4-45	10/25/21	NA	NA	NA	NA
	4-29	4-29	10/26/21	10/26/21	13	202	2.7E-07
		4-43	10/26/21	NA	NA	NA	NA
		4-27	10/26/21	NA	NA	NA	NA
	4-33	4-33	10/27/21	10/27/21	15	259	2.4E-07
		4-25	10/27/21	NA	NA	NA	NA
		4-34	10/27/21	NA	NA	NA	NA
		4-51	10/27/21	NA	NA	NA	NA
	4-42	4-42	10/28/21	10/28/21	15.5	90	5.5E-06
		4-40	10/28/21	NA	NA	NA	NA
	4-32	4-32	10/29/21	10/29/21	17	35	5.9E-06
		4-30	10/29/21	NA	NA	NA	NA
	4-31	4-31	10/30/21	10/30/21	10	134	1.7E-06
		4-41	10/30/21	NA	NA	NA	NA
	4-35	4-35	11/1/21	11/1/21	20	162	3.2E-07
		4-36	11/1/21	NA	NA	NA	NA
	4-38	4-38	11/2/21	11/2/21	16	62	8.5E-07
		4-37	11/2/21	NA	NA	NA	NA
Ex-Situ Samples (SMA)	4-72 [3]	4-72	9/29/21	9/29/21	7.7	335	5.9E-08
	4-73 Re-Mix [3,4]	4-73	11/2/21	11/2/21	-	99	6.7E-07
	CAA-4 Ex-Situ (1)	CAA-4 Ex-Situ (1)	9/22/21	9/22/21	-	385	1.2E-07
	CAA-4 Ex-Situ (2)	CAA-4 Ex-Situ (2)	9/23/21	9/23/21	-	476	3.7E-07
	CAA-4 Ex-Situ (3)	CAA-4 Ex-Situ (3)	9/24/21	9/24/21	-	612	6.0E-08
	CAA-4 Ex-Situ (4)	CAA-4 Ex-Situ (4)	9/25/21	9/25/21	-	673	4.7E-08
	CAA-4 Ex-Situ (5)	CAA-4 Ex-Situ (5)	9/28/21	9/28/21	-	768	1.7E-07
	CAA-4 SP	CAA-4 SP	9/30/21	9/30/21	-	577	7.9E-08

Notes:

PSI = pounds per square inch

cm/sec = centimeter per second

SMA = soil management area

a - 42 day lab result is presented in the table for this sample.

Red shade denotes a sample that fails hydraulic conductivity (<1X10-6 cm/sec) performance goal

1. Original Cell 2-36 QC sample from 8/19/2021 was not sent to laboratory for testing. After multiday on-site observation, it was field-determined that additional ISS-mixing would be required for this cell. A second QC sample from Cell 2-36 was collected on 9/2/2021 and achieved passing results.

2. Cell 2-32 was started on the afternoon of 9/9 but was not completed due to hard silt. One sample was collected on 9/9 and a second sample was also collected on 9/10 to confirm site conditions.

3. Cells 4-72 and 4-73 represent excess soil volume from CAA-4 that could not be accommodated within the CAA footprint. Excess in-situ mixed soils were transported from CAA-4 to the SMA, and spread out in lifts and compacted after the soils were fully stabilized through mixing.

4. Laboratory preliminary samples from the original cell indicated performance standards would not be achieved and additional mixing was required. These original samples were discarded and the Cell 4-73 was re-mixed and re-sampled on 11/2/2021.

2.11 Construction - Groundwater Treatment

The groundwater treatment program was implemented by REGENESIS Remediation Services (RRS), which included in situ groundwater treatment along the northern boundary of the ASKO parcel, generally north of CAA-5 and along a portion of the CAA-2.b excavation.

Groundwater treatment generally north of CAA-5 included direct injection utilizing a standard size direct push technology (DPT) rig of a reagent mixture designed to capture incoming contaminants, rapidly remove them from groundwater and create a treatment zone of chemical reduction and bioremediation. The injected material was Sulfidated Micro Zero Valent Iron (S-MicroZVI) and Bio-Dechlor INOCULUM Plus (BDI Plus) and PlumeStop Colloidal Biomatrix (PlumeStop™). Reagents were injected through 50 injection points with a target top injection depth of 20 feet below current ground surface and a bottom target injection depth of 28 feet below current ground surface. Injection points were installed along 2 rows, with about 7 feet between rows, over a distance of 165 feet, shown on as-built Drawing C-1 and Figure 1 in Appendix J. Injection points were installed and decommissioned by ESN Northwest, a licensed Washington driller and were registered, installed, and decommissioned per WAC 173-160. All injection points were filled with bentonite chips and hydrated in place , for the decommissioning method.

During the application, real-time information was collected at each of the injection points and at nearby monitoring wells MW06 and 01MW85, and analyzed to verify design assumptions and subsurface reagent distribution. Data collected and analyzed from the two monitoring wells included groundwater quality parameters (i.e., pH, conductivity, DO, ORP, etc.), depth to water measurements, visual indicators through groundwater samples, and in-field injection concentration test kits. Details of the direct injection and associated data are included in Appendix J. In situ groundwater treatment along the northern border of CAA-5 and along the northern border of the ASKO parcel was completed December 7 through 16, 2021.

In CAA-2.b, dry amendments were added during backfilling activities in the northeast and the northwest corners shown on as-built Drawing C-3. ORC Advanced pellets were spread by hand evenly across the application area both horizontally and vertically within the saturated zone during backfilling. ORC application was completed in the northeast corner of CAA-2.b from October 14 through 15, 2021, and in the northwest corner of CAA-2.b from October 19 through 20, 2021. As-built Drawing C-3 shows the areas where lagging was removed from the northeast portion of the excavation to facilitate groundwater flow. Trench boxes were used for shoring along the northwest portion of the excavation and were completely removed after excavation activities were completed.

Deviations from Design

The EDR specified the dry amendment placed in the northeast corner of CAA-2.b. ORC Advanced pellets were placed in both corners – the northeast and the northwest – to provide additional treatment along the extents of CAA-2.b.

Groundwater treatment was completed per the RRS design, with the exception of the pressure activated probes, which did not function as expected and were substituted with 2-foot retractable screens to accomplish injection design goals as discussed in Appendix J.

No other deviations from the design occurred for this construction element.

2.12 Construction - Interceptor Trench & Permeable Reactive Treatment

An interceptor trench was constructed at the ASKO/BNSF boundary to capture and treat impacted groundwater migrating within the Perched WBZ on the BNSF parcel. The location of the trench is shown on construction as-built Drawing C-10. Installation of the interceptor trench and PRB was completed on November 19, 2021.

The interceptor trench was 90 feet long by 3 feet wide by 15 feet deep. Large diameter holes (4-inches) were drilled in the lagging from the shoring wall from an approximately 50 foot wide area to facilitate Perched WBZ groundwater flow into the trench. Holes were placed on 4-foot spacings to allow additional water movement through the lagging. EDR construction drawing SS-1 including drilling holes through the lagging to encourage water movement. Drawing SS-1 specified a 1-inch diameter drainage hole on 2-foot centers. The holes were increased to 4-inches and because of the larger diameter, the spacing was shifted to 4-foot centers.

The trench was constructed per the design with the exception of the vault size and the location of the gravity well. The vault was an Oldcastle 6x12-GA 1,500 gallon interceptor, which was larger, but functionally equivalent to the vault specified in the EDR. A total of 1,025 gallons of gZVI was placed in the vault to supplement the treatment provided by the mixed sand and gZVI placed within the trench. Copies of the gZVI import certification are included in Appendix F. The gravity well (Ecology well ID Tag Number BNC 553) was installed on November 12, 2021; copies of the well log are included in Appendix H. The gravity well location was adjusted in the field to accommodate access constraints for drilling equipment. The location was moved approximately 15 feet northwest of the design location; the final gravity well location is shown on as-built Drawing C-10.

The remainder of the trench was backfilled to grade with clean import fill.

2.13 Construction - Stabilization Surfaces

After cleanup actions were completed in each CAA and the SMA, the areas were backfilled and returned to a stabilized condition to prepare the site for future development. Compacted ballast rock was used as the final surface on all other areas to provide a stable surface and to protect subsurface conditions. An approximate 3 inch layer of ballast rock was placed on any remaining disturbed site surfaces to provide a final stabilized surface. Final site grading and interim caps were completed on December 13, 2021. As-built Drawing C-11 show the interim project stabilization surfaces at each area of the Upland AOC. Perimeter

fencing in accessible areas will also be maintained during the interim stabilization period to limit property access prior to full site development.

3 Transportation, Recycling, and Disposal of Material

Soil and debris removed during excavation from the work areas was loaded into dump trucks and transported to Republic Services Seattle Regional Disposal Intermodal facility located at 3rd and Lander Streets in Seattle, WA and Waste Management's Duwamish Reload Facility at 7400 8th Ave S, Seattle, WA for disposal. A total of 15,381 tons of soil and debris were excavated from the cleanup action area and were ultimately disposed of at Roosevelt Regional Landfill in Roosevelt, Washington (12,663 tons/ Republic Services) and Columbia Ridge Landfill in Arlington, Oregon (2,718 tons Waste Management's). A total of 1,240 tons of concrete was disposed of at Renton Concrete Recyclers. A total of 420 tons of demolition debris and materials were hauled off site and disposed of at Roosevelt landfill. All contaminated soil disposed of offsite was characterized based on representative data collected during the remedial investigation.

4 Site Restoration

Site restoration included stabilizing surfaces, detailed in Section 2.13 for the upland AOC and completion of the waterfront parcel to similar conditions as pre construction activities. During backfilling of the waterfront parcel, grades were smoothed and flatten to facilitate future site use. Additional shoreline armor, above OWH, was placed along the northeastern edge of the waterfront parcel.

All disturbed and remediation areas were surfaced with compacted ballast rock to create a firm final surface. A total of 7,749 tons of ballast rock was placed across the site to stabilize final surfaces.

Within the Bulk Terminal area, site restoration included scraping of surface soil from the access road used for transport of swell material from the CAA-2 and -4, due to potential cross-contamination during construction of the SMA. The scraped material was stabilized with Portland cement and incorporated back into the SMA fill area.

Fencing was placed along the toe of the SMA to limit access between the interim and future site development. The perimeter fencing will be maintained to further restrict site access, to AOCs, before full site development.

5 Conclusions

Project construction was conducted between July 19 and December 16, 2021. The construction was completed in general conformance with the project design and as described herein. As presented in this report, the removal action included:

- Excavation and off-site disposal of 15,390 tons of contaminated soil (including 9.64 tons of soil contaminated with diesel fuel from an on-site localized spill during the construction effort).
- The encapsulation of approximately 9,500 cubic yards of contaminated soils from CAA-2.a and approximately 18,400 cubic yards of contaminated soils from CAA-4 using ISS.
- In situ groundwater treatment of the TCE groundwater plume using a trademarked colloidal biomatrix (PlumeStopTM) mixed with sulfidated microscale zero-valent iron (mZVI) through injections along a portion of the northern border of the ASKO parcel, just south of W Commodore Way.
- Installation of an interceptor trench and PRB wall adjacent to and upgradient of the ISS monolith in CAA-4.a and CAA-4.b to capture and treat groundwater containing IHSs greater than the CULs from the adjacent BNSF parcel.
- In-situ groundwater treatment in the NE and NW corners of CAA-2.b through application of an oxygen releasing pellet compound to treat approximately 336 cubic yards of contaminated soil and groundwater that will remain beneath utilities in the ROW.
- The waterfront AOC included excavation and offsite disposal of contaminated soil with IHS concentrations greater than CULs in CAA-6 and CAA-7. The waterfront AOC achieved compliance with soil CULs as a result of this cleanup action.
- Capping and institutional controls for the Upland AOC have been partially completed. Fencing has been installed to restrict access to areas that do not have a gravel cap, shown on Figure 3. Additional capping and institutional controls will be completed in conjunction with site wide redevelopment.

6 References

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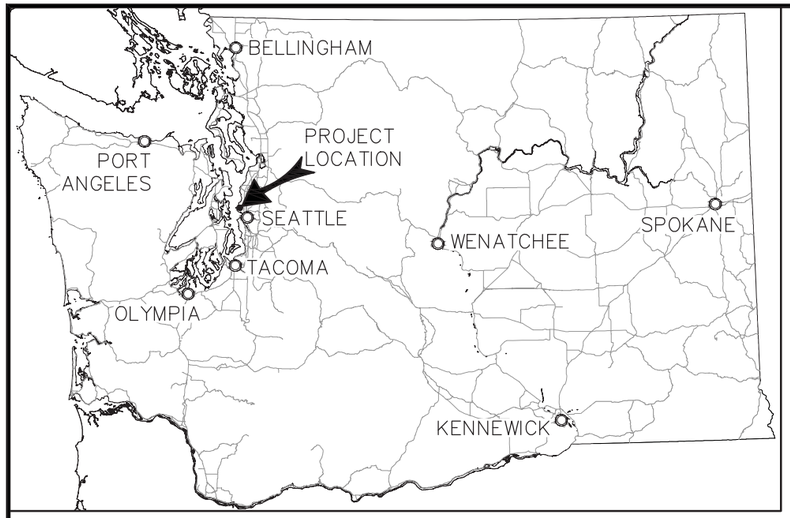
Figures



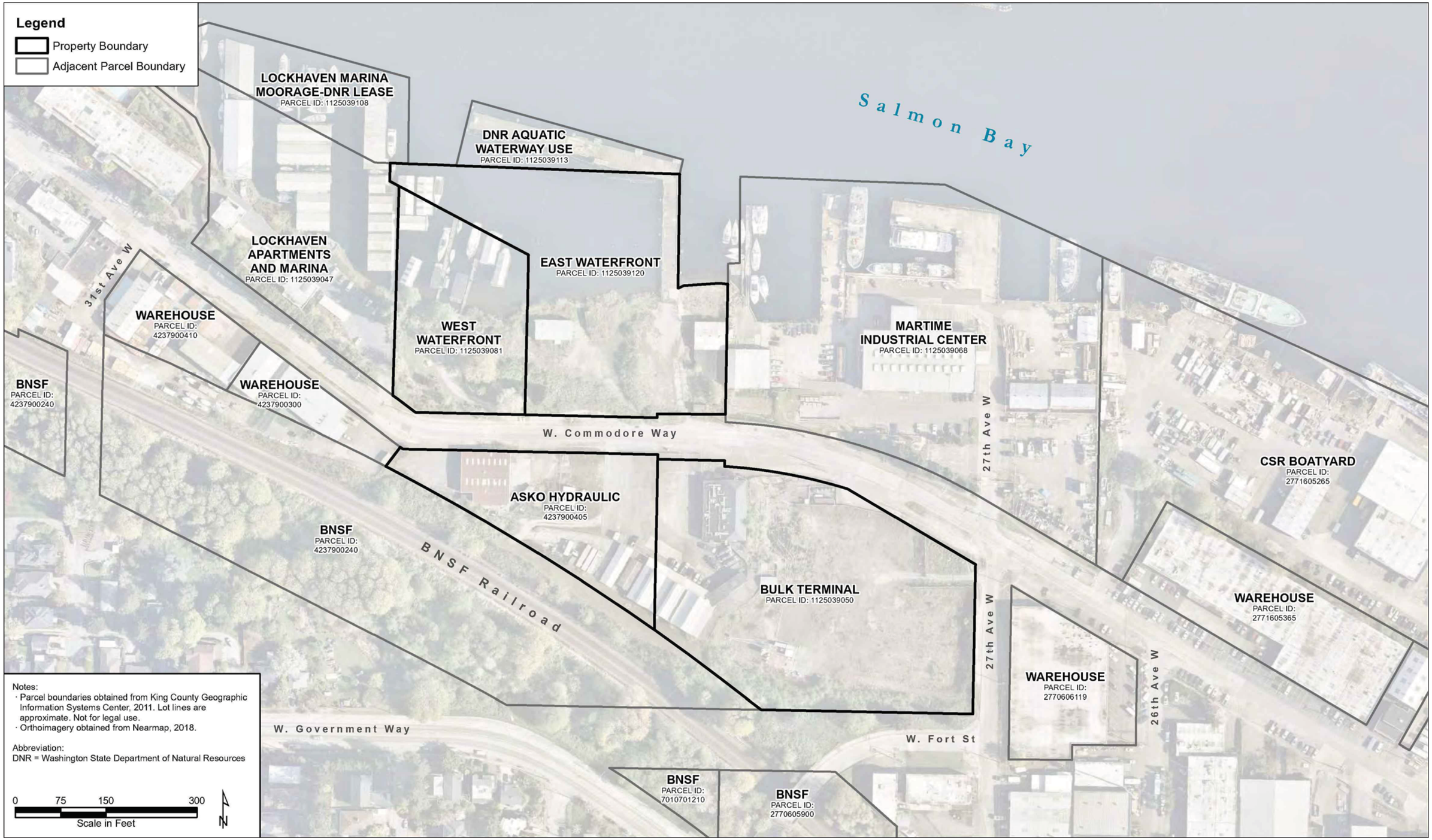
LOCATION MAP

Not to Scale

CRETE CONSULTING, INC.

Remedial Action Completion Report
Time Oil Bulk Terminal
Seattle, Washington

Figure 1
Property Location

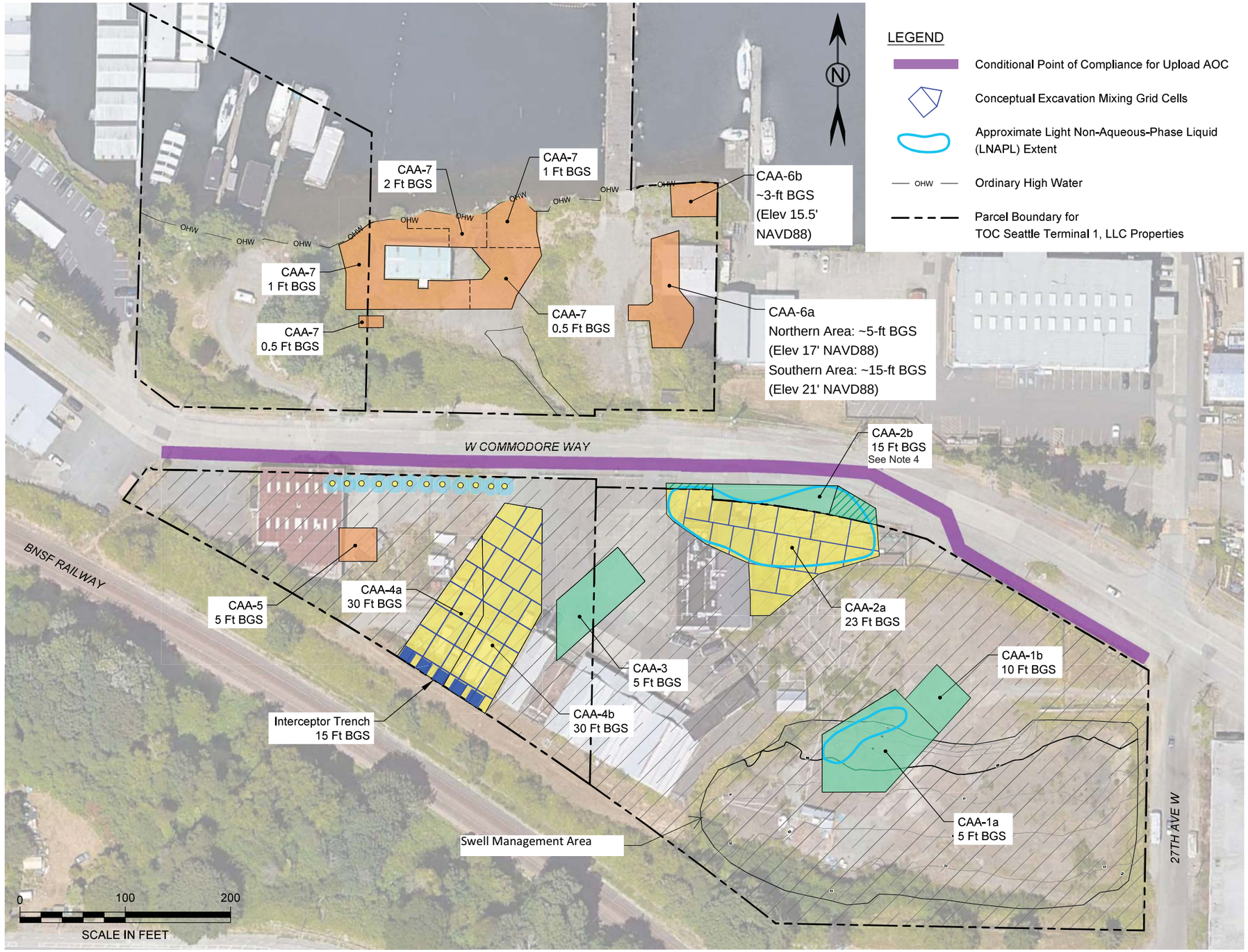


CRETE CONSULTING, INC.

Remedial Action Completion Report
Time Oil Bulk Terminal
Seattle, Washington

Figure 2
Property Map

File: D:_Projects\Crete\Time Oil Seattle\Time Oil_EDR Fig Prop Map.dwg Date: 4/28/2021 Author: Cabryn



LEGEND

- Conditional Point of Compliance for Upload AOC
- Conceptual Excavation Mixing Grid Cells
- Approximate Light Non-Aqueous-Phase Liquid (LNAPL) Extent
- OHW — Ordinary High Water
- Parcel Boundary for TOC Seattle Terminal 1, LLC Properties

SELECTED REMEDIAL ALTERNATIVE

- Capping With Pavement Or Buildings Upland Area Of Concern (AOC)
- Excavation to Cleanup Level (CUL)
- Excavation to Remediation Level (REL)
- ORC - Advanced Application Area (See Note 4)
- In-Situ Stabilization / Solidification
- In-Situ Groundwater Treatment (See Note 1)
- Interceptor Trench

NOTES

1. In-Situ groundwater treatment includes enhanced reductive dechlorination of the TCE and vinyl chloride groundwater plume using a trademark colloidal biomatrix and sulfidated micro zero-valent iron mixture (PlumeStop and S-MicroZVI) to create a passive treatment zone of chemical reduction and bioremediation in the Shallow WBZ and the addition of an enriched natural microbial consortium (BDI Plus) to stimulate rapid dechlorination of TCE.
2. Parcel boundaries obtained from King County GIS Center, 2011. Lot lines are approximate. Not for legal use.
3. Capped areas shown are proposed and have not yet been implemented. The final capping will be completed in conjunction with redevelopment of the Property.
4. ORC Advance Pellets Regenesis added during backfilling activities.

ABBREVIATIONS

AOC	=	Area of Concern
BDI	=	Bio-Dechlor INOCULUM
CAA	=	Cleanup Action Area
CUL	=	Cleanup Level
CY	=	Cubic Yards
Ft BGS	=	Feet Below Ground Surface
ISS	=	In-Situ Solidification and Stabilization
LNAPL	=	Light Non-Aqueous-Phase Liquid
REL	=	Remediation Level
TCE	=	Trichloroethene
WBZ	=	Water-Bearing Zone
OHW	=	Ordinary High Water Mark
NAVD88	=	North American Vertical Datum of 1988
Elev	=	Elevation

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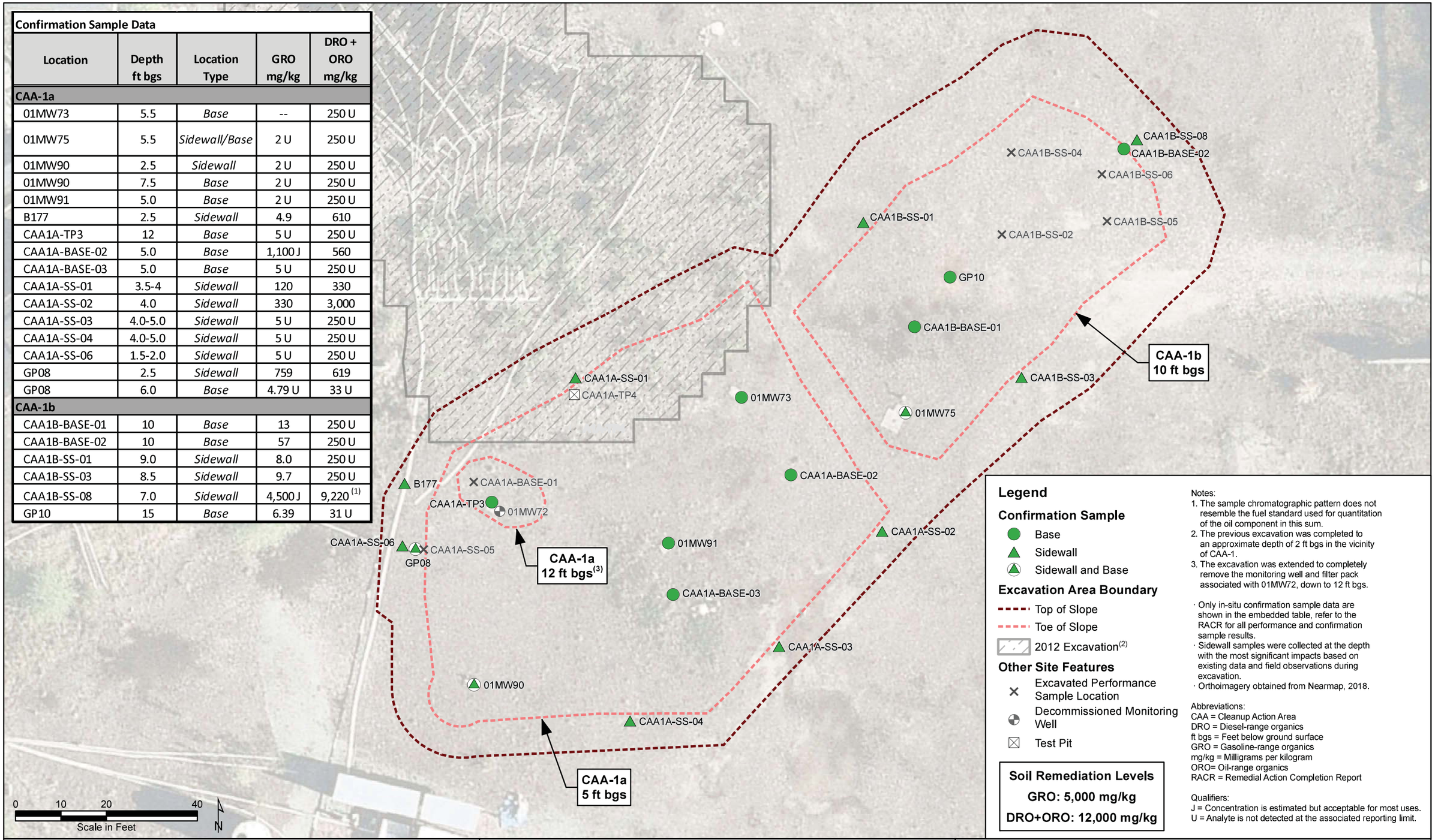
Remedial Action Completion Report
Time Oil Bulk Terminal
Seattle, Washington

Figure 3
Property Cleanup Summary

Appendix A-1
Soil Confirmation Sample Maps and Backup

Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO + ORO mg/kg
CAA-1a				
01MW73	5.5	*Base*	--	250 U
01MW75	5.5	*Sidewall/Base*	2 U	250 U
01MW90	2.5	*Sidewall*	2 U	250 U
01MW90	7.5	*Base*	2 U	250 U
01MW91	5.0	*Base*	2 U	250 U
B177	2.5	*Sidewall*	4.9	610
CAA1A-TP3	12	*Base*	5 U	250 U
CAA1A-BASE-02	5.0	*Base*	1,100 J	560
CAA1A-BASE-03	5.0	*Base*	5 U	250 U
CAA1A-SS-01	3.5-4	*Sidewall*	120	330
CAA1A-SS-02	4.0	*Sidewall*	330	3,000
CAA1A-SS-03	4.0-5.0	*Sidewall*	5 U	250 U
CAA1A-SS-04	4.0-5.0	*Sidewall*	5 U	250 U
CAA1A-SS-06	1.5-2.0	*Sidewall*	5 U	250 U
GP08	2.5	*Sidewall*	759	619
GP08	6.0	*Base*	4.79 U	33 U
CAA-1b				
CAA1B-BASE-01	10	*Base*	13	250 U
CAA1B-BASE-02	10	*Base*	57	250 U
CAA1B-SS-01	9.0	*Sidewall*	8.0	250 U
CAA1B-SS-03	8.5	*Sidewall*	9.7	250 U
CAA1B-SS-08	7.0	*Sidewall*	4,500 J	9,220 (1)
GP10	15	*Base*	6.39	31 U



Legend

Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary
- Top of Slope
- Toe of Slope
- 2012 Excavation(2)

Other Site Features
- Excavated Performance Sample Location
- Decommissioned Monitoring Well
- Test Pit

Soil Remediation Levels
GRO: 5,000 mg/kg
DRO+ORO: 12,000 mg/kg

Notes:
1. The sample chromatographic pattern does not resemble the fuel standard used for quantitation of the oil component in this sum.
2. The previous excavation was completed to an approximate depth of 2 ft bgs in the vicinity of CAA-1.
3. The excavation was extended to completely remove the monitoring well and filter pack associated with 01MW72, down to 12 ft bgs.

- Only in-situ confirmation sample data are shown in the embedded table, refer to the RACR for all performance and confirmation sample results.
- Sidewall samples were collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- Orthoimagery obtained from Nearmap, 2018.

Abbreviations:
CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
RACR = Remedial Action Completion Report

Qualifiers:
J = Concentration is estimated but acceptable for most uses.
U = Analyte is not detected at the associated reporting limit.

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Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-1
CAA-1 Excavation Area Confirmation Soil Sample Results

I:\GIS\Projects\Cantera-TOC\MXD\Remedial Action Completion Report\Figure 2 CAA-1 Excavation Area Confirmation Soil Sample Results.mxd
1/24/2022

Existing Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO + ORO mg/kg
CAA-1a				
01MW73	5.5	*Base*	--	250 U
01MW75	5.5	*Sidewall/Base*	2 U	250 U
01MW90	2.5	*Sidewall*	2 U	250 U
01MW90	7.5	*Base*	2 U	250 U
01MW91	5	*Base*	2 U	250 U
B177	2.5	*Sidewall*	4.9	610
GP08	2.5	*Sidewall*	760	620
GP08	6	*Base*	4.8 U	33 U
CAA-1b				
GP10	15	*Base*	6.4	31 U

Summary of Other Available Data in CAA-1

GRO (mg/kg)

	CAA-1a					CAA-1b
Depth (ft bgs)	SB-13	01MW72	01MW73	01MW91	GP08	GP10
0-1		8				
2–3	~~9,300~~			5.0	760	
4–5						~~50~~
5–6				2.0 U		
6–7					4.8 U	
7–8				2.0 U		~~9,300~~
9–10						
10–11			3.0			
12-13					4.6 U	
15–16					4.8 U	6.4

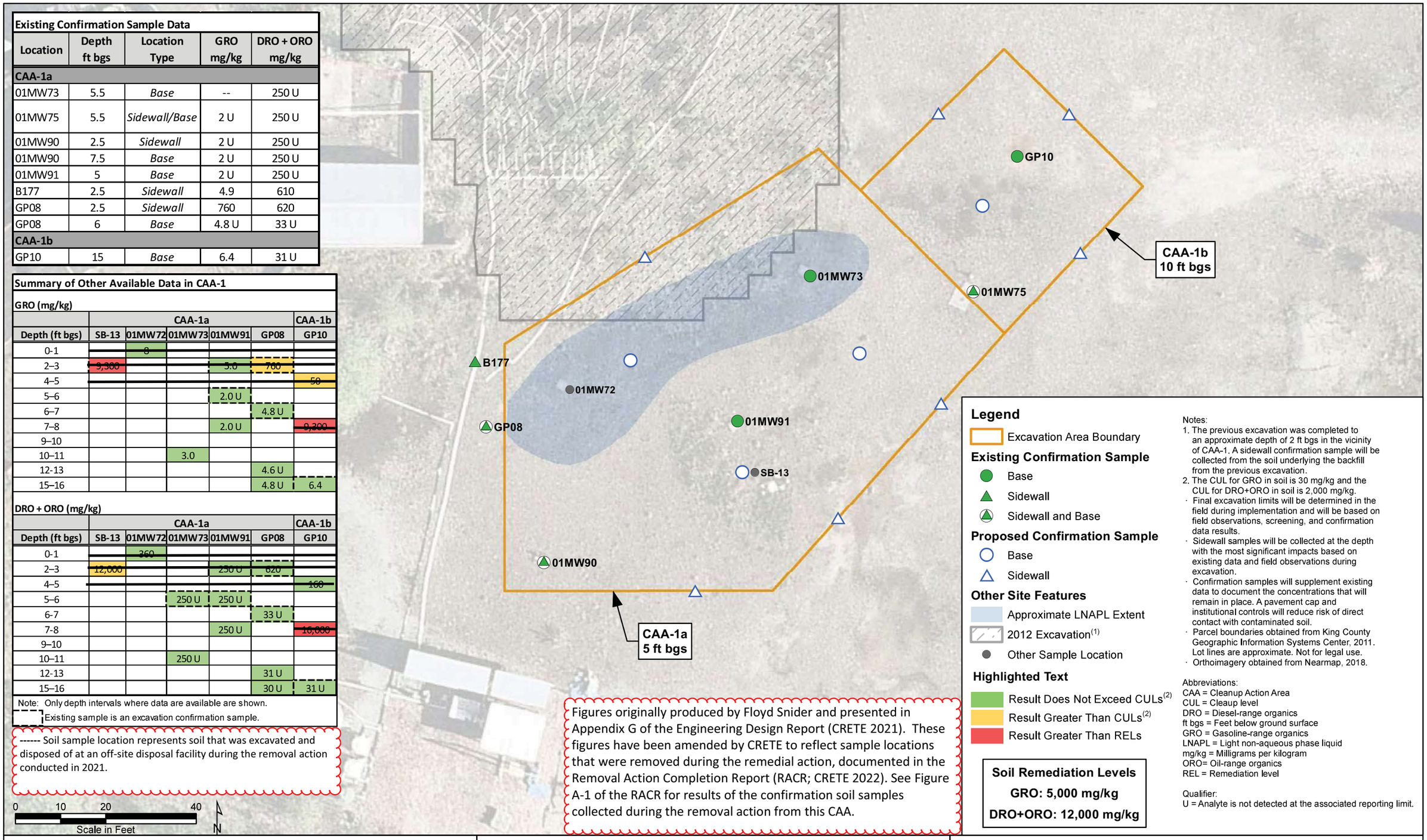
DRO + ORO (mg/kg)

	CAA-1a					CAA-1b
Depth (ft bgs)	SB-13	01MW72	01MW73	01MW91	GP08	GP10
0-1		360				
2–3	~~12,000~~			250 U	620	
4–5						~~160~~
5–6			250 U	250 U		
6-7					33 U	
7-8				250 U		~~16,000~~
9–10						
10–11			250 U			
12-13					31 U	
15–16					30 U	31 U

Note: Only depth intervals where data are available are shown.

Existing sample is an excavation confirmation sample.

------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021.



Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-1 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

Excavation Area Boundary

Existing Confirmation Sample

- Base
- Sidewall
- Sidewall and Base

Proposed Confirmation Sample

- Base
- Sidewall

Other Site Features

- Approximate LNAPL Extent
- 2012 Excavation(1)
- Other Sample Location

Highlighted Text

- Result Does Not Exceed CULs(2)
- Result Greater Than CULs(2)
- Result Greater Than RELs

Soil Remediation Levels
GRO: 5,000 mg/kg
DRO+ORO: 12,000 mg/kg

Notes:
1. The previous excavation was completed to an approximate depth of 2 ft bgs in the vicinity of CAA-1. A sidewall confirmation sample will be collected from the soil underlying the backfill from the previous excavation.
2. The CUL for GRO in soil is 30 mg/kg and the CUL for DRO+ORO in soil is 2,000 mg/kg.

- Final excavation limits will be determined in the field during implementation and will be based on field observations, screening, and confirmation data results.
- Sidewall samples will be collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- Confirmation samples will supplement existing data to document the concentrations that will remain in place. A pavement cap and institutional controls will reduce risk of direct contact with contaminated soil.
- 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:
CAA = Cleanup Action Area
CUL = Cleaup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
LNAPL = Light non-aqueous phase liquid
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level

Qualifier:
U = Analyte is not detected at the associated reporting limit.

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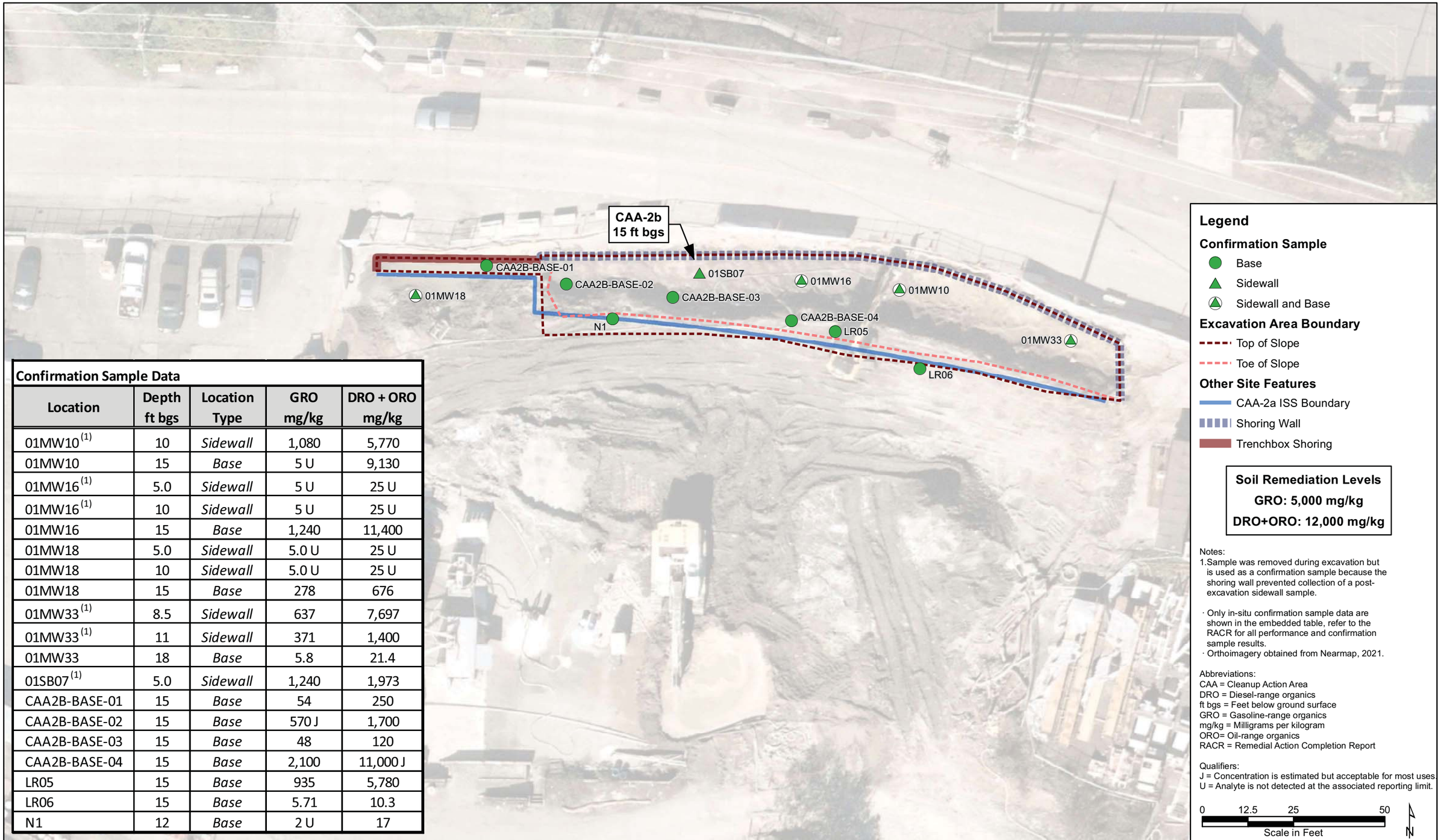
Seattle, Washington

Figure A-2
CAA-1 Excavation Area Sampling Plan

I:\GIS\Projects\Cantera-TOC\MXD\Eng Design\Compliance Sampling\Figure G-2 CAA-1 Excavation Area Sampling Plan.mxd
5/5/2021



Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO + ORO mg/kg
01MW10 (1)	10	*Sidewall*	1,080	5,770
01MW10	15	*Base*	5 U	9,130
01MW16 (1)	5.0	*Sidewall*	5 U	25 U
01MW16 (1)	10	*Sidewall*	5 U	25 U
01MW16	15	*Base*	1,240	11,400
01MW18	5.0	*Sidewall*	5.0 U	25 U
01MW18	10	*Sidewall*	5.0 U	25 U
01MW18	15	*Base*	278	676
01MW33 (1)	8.5	*Sidewall*	637	7,697
01MW33 (1)	11	*Sidewall*	371	1,400
01MW33	18	*Base*	5.8	21.4
01SB07 (1)	5.0	*Sidewall*	1,240	1,973
CAA2B-BASE-01	15	*Base*	54	250
CAA2B-BASE-02	15	*Base*	570 J	1,700
CAA2B-BASE-03	15	*Base*	48	120
CAA2B-BASE-04	15	*Base*	2,100	11,000 J
LR05	15	*Base*	935	5,780
LR06	15	*Base*	5.71	10.3
N1	12	*Base*	2 U	17

Legend

Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary
- Top of Slope
- Toe of Slope

Other Site Features
- CAA-2a ISS Boundary
- Shoring Wall
- Trenchbox Shoring

Soil Remediation Levels
GRO: 5,000 mg/kg
DRO+ORO: 12,000 mg/kg

Notes:
1. Sample was removed during excavation but is used as a confirmation sample because the shoring wall prevented collection of a post-excavation sidewall sample.

· Only in-situ confirmation sample data are shown in the embedded table, refer to the RACR for all performance and confirmation sample results.
· Orthoimagery obtained from Nearmap, 2021.

Abbreviations:
CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
RACR = Remedial Action Completion Report

Qualifiers:
J = Concentration is estimated but acceptable for most uses.
U = Analyte is not detected at the associated reporting limit.

0 12.5 25 50
Scale in Feet

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Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-3
CAA-2b Excavation Area Confirmation Soil Sample Results

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1/18/2022

Existing Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO + ORO mg/kg
01MW10	*10*	*Sidewall*	1,100	5,800
01MW10	*15*	*Base*	5.0 U	9,100
01MW16	*5*	*Sidewall*	5.0 U	25 U
01MW16	*10*	*Sidewall*	5.0 U	25 U
01MW16	*15*	*Base*	1,200	11,000
01MW18	*5*	*Sidewall*	5.0 U	25 U
01MW18	*10*	*Sidewall*	5.0 U	25 U
01MW18	*15*	*Base*	280	680
01MW33	*8.5*	*Sidewall*	640	7,700
01MW33	*11*	*Sidewall*	370	1,400
01MW33	*18*	*Base*	5.8	21
01SB07	*5*	*Sidewall*	1,200	2,000
LR05	*15*	*Base*	940	5,800
LR06	*15*	*Base*	5.7	10
N1	*12*	*Base*	2.0 U	17

Summary of Other Available Data in CAA-2b

Gasoline-Range Organics (mg/kg)

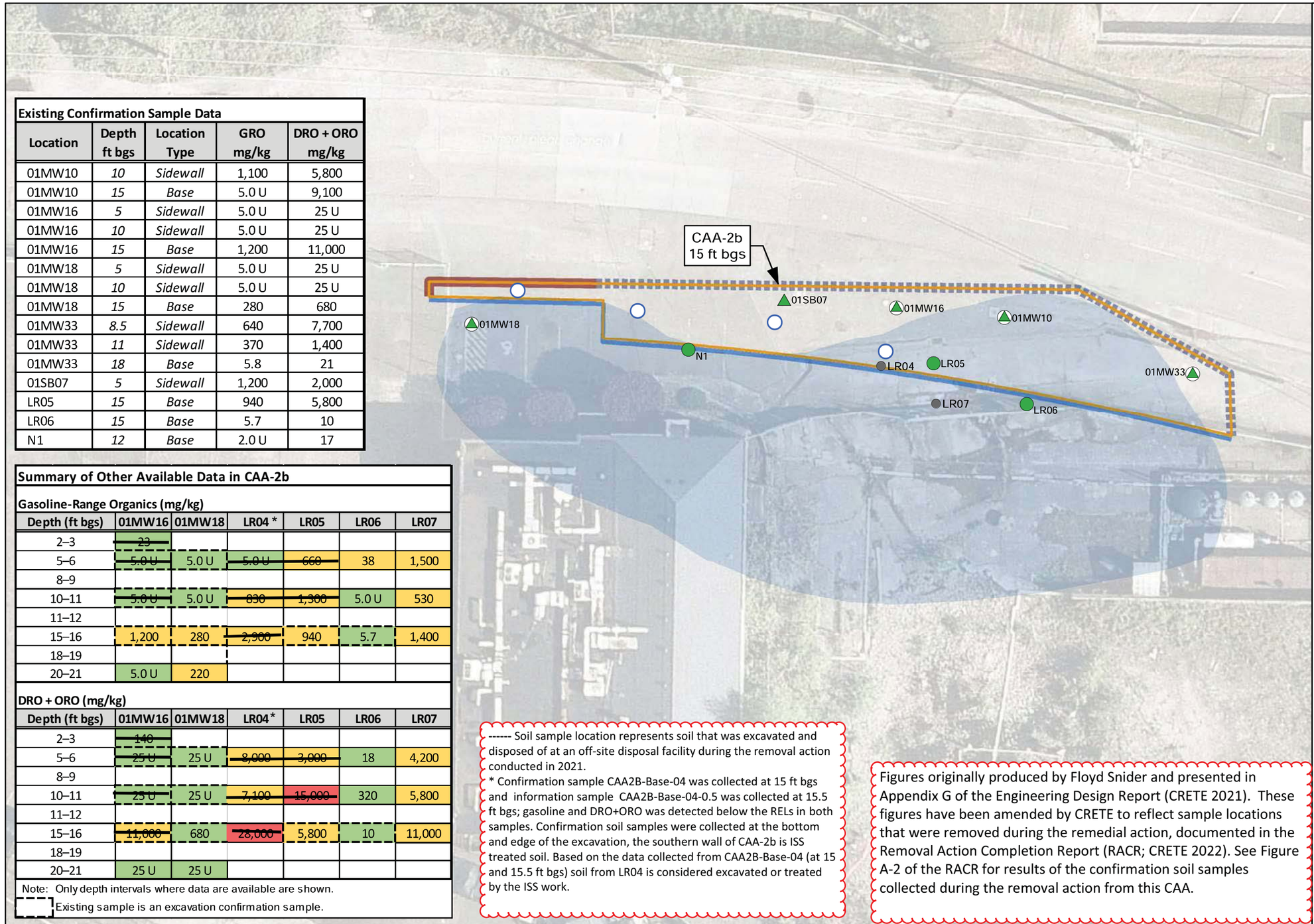
Depth (ft bgs)	01MW16	01MW18	LR04 *	LR05	LR06	LR07
2–3	~~23~~					
5–6	~~5.0 U~~	5.0 U	~~5.0 U~~	~~660~~	38	1,500
8–9						
10–11	~~5.0 U~~	5.0 U	~~830~~	~~1,300~~	5.0 U	530
11–12						
15–16	1,200	280	~~2,900~~	940	5.7	1,400
18–19						
20–21	5.0 U	220				

DRO + ORO (mg/kg)

Depth (ft bgs)	01MW16	01MW18	LR04*	LR05	LR06	LR07
2–3	~~140~~					
5–6	~~25 U~~	25 U	~~8,000~~	~~3,000~~	18	4,200
8–9						
10–11	~~25 U~~	25 U	~~7,100~~	~~15,000~~	320	5,800
11–12						
15–16	~~11,000~~	680	~~28,000~~	5,800	10	11,000
18–19						
20–21	25 U	25 U				

Note: Only depth intervals where data are available are shown.

Existing sample is an excavation confirmation sample.



------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021.

* Confirmation sample CAA2B-Base-04 was collected at 15 ft bgs and information sample CAA2B-Base-04-0.5 was collected at 15.5 ft bgs; gasoline and DRO+ORO was detected below the RELs in both samples. Confirmation soil samples were collected at the bottom and edge of the excavation, the southern wall of CAA-2b is ISS treated soil. Based on the data collected from CAA2B-Base-04 (at 15 and 15.5 ft bgs) soil from LR04 is considered excavated or treated by the ISS work.

Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-2 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

- Excavation Area Boundary
- CAA-2a ISS Boundary
- Shoring Wall
- Trenchbox Shoring

Existing Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Proposed Confirmation Sample
- Base

Other Site Features
- Approximate LNAPL Extent
- Other Sample Location

Highlighted Text
- Result Does Not Exceed CULs(1)
- Result Greater Than CULs(1)
- Result Greater Than RELs

Soil Remediation Levels
GRO: 5,000 mg/kg
DRO+ORO: 12,000 mg/kg

Notes:
1. The CUL for GRO in soil is 30 mg/kg and the CUL for DRO+ORO in soil is 2,000 mg/kg.
- Final excavation limits will be determined in the field during implementation and will be based on field observations, screening, and confirmation data results.
- Confirmation samples will supplement existing data to document the concentrations that will remain in place. A pavement cap and institutional controls will reduce risk of direct contact with contaminated soil.
- 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:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
LNAPL = Light non-aqueous phase liquid
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 12.5 25 50
Scale in Feet

N

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Figure A-4
CAA-2b Excavation Area Sampling Plan

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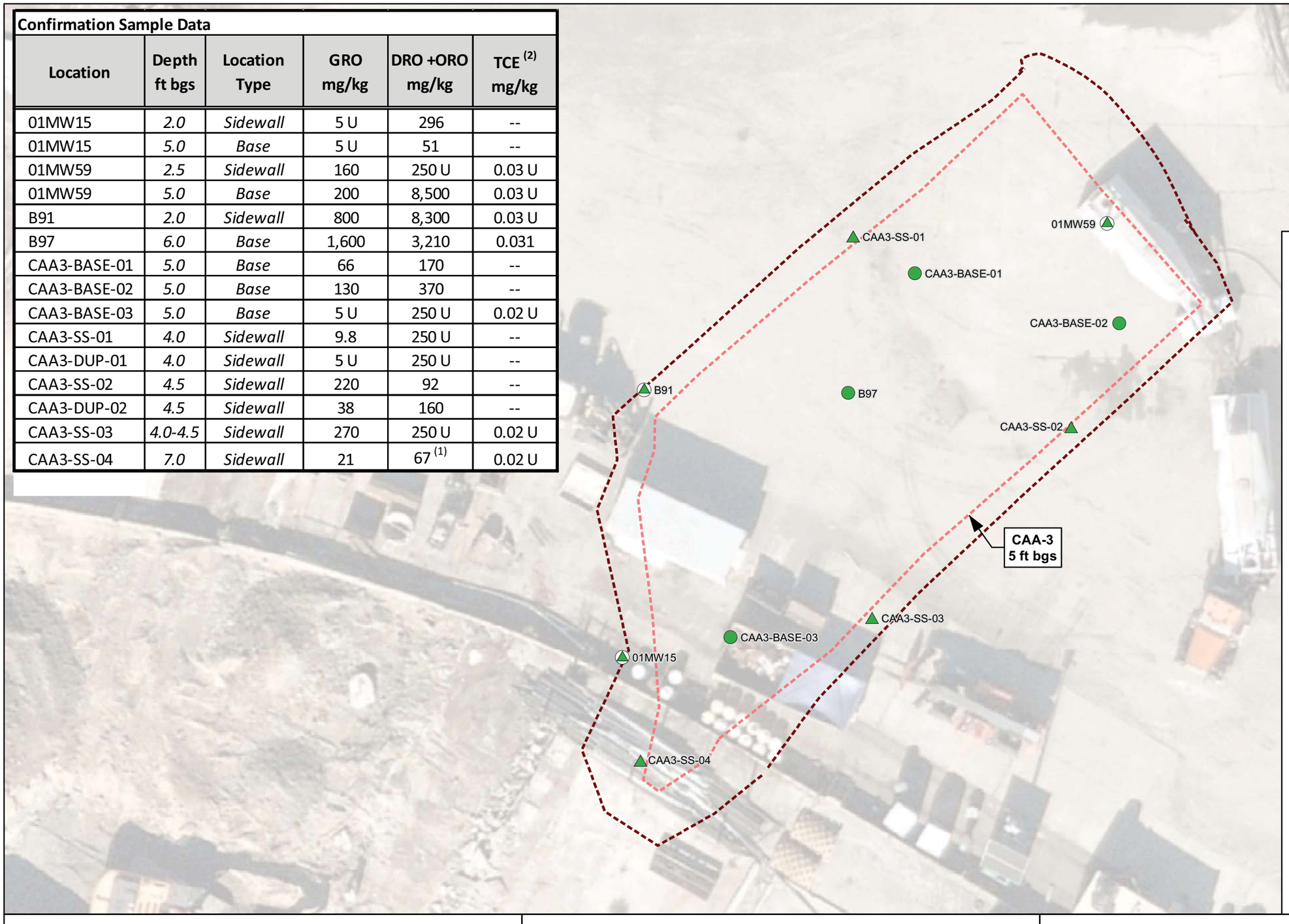
4/30/2021

Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO +ORO mg/kg	TCE [2] mg/kg
01MW15	*2.0*	*Sidewall*	5 U	296	--
01MW15	*5.0*	*Base*	5 U	51	--
01MW59	*2.5*	*Sidewall*	160	250 U	0.03 U
01MW59	*5.0*	*Base*	200	8,500	0.03 U
B91	*2.0*	*Sidewall*	800	8,300	0.03 U
B97	*6.0*	*Base*	1,600	3,210	0.031
CAA3-BASE-01	*5.0*	*Base*	66	170	--
CAA3-BASE-02	*5.0*	*Base*	130	370	--
CAA3-BASE-03	*5.0*	*Base*	5 U	250 U	0.02 U
CAA3-SS-01	*4.0*	*Sidewall*	9.8	250 U	--
CAA3-DUP-01	*4.0*	*Sidewall*	5 U	250 U	--
CAA3-SS-02	*4.5*	*Sidewall*	220	92	--
CAA3-DUP-02	*4.5*	*Sidewall*	38	160	--
CAA3-SS-03	*4.0-4.5*	*Sidewall*	270	250 U	0.02 U
CAA3-SS-04	*7.0*	*Sidewall*	21	67 [1]	0.02 U



Legend

Confirmation Sample

- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary

- Top of Slope
- Toe of Slope

Soil Remediation Levels

GRO: 5,000 mg/kg

DRO+ORO: 12,000 mg/kg

TCE: 1 mg/kg

Notes:

1. The sample chromatographic pattern does not resemble the fuel standard used for quantitation of the oil component in this sum.
2. TCE was only analyzed at select locations as noted on SAP figure G-4 from the EDR.

· Only in-situ confirmation sample data are shown in the embedded table, refer to the RACR for all performance and confirmation sample results.
· Sidewall samples were collected at the depth with the most significant impacts based on existing data and field observations during excavation.
· Orthoimagery obtained from Nearmap, 2021.

Abbreviations:
CAA = Cleanup Action Area
DRO = Diesel-range organics
EDR = Engineering Design Report
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
RACR = Remedial Action Completion Report
SAP = Sampling and Analysis Plan
TCE = Trichloroethylene

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet

N

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Figure A-5
CAA-3 Excavation Area Confirmation Soil Sample Results

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1/19/2022

Existing Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO +ORO mg/kg	TCE mg/kg
01MW15	*2*	*Sidewall*	5.0 U	300	--
01MW15	*5*	*Base*	5.0 U	51	--
01MW59	*2.5*	*Sidewall*	160	250 U	0.030 U
01MW59	*5*	*Base*	200	8,500	0.030 U
B91	*2*	*Sidewall*	800	8,300	--
B91	*10*	*Base*	--	--	0.098
B97	*6*	*Base*	1,600	3,200	0.031

Summary Other of Available Data in CAA-3

GRO (mg/kg)

Depth (ft bgs)	01MW15	01MW59	B89	B90	B91*	B97	B130	SB-30	SB-31
2–3	5.0 U	~~160~~			~~800~~			~~5,100~~	~~580~~
3–4				~~380~~					
5–6	5.0 U	200							
6–7						1,600			
7–8							2.0 U		
10–11	5.0 U								
11–12			420						
13–14			9,700						
15–16	5.0 U	2.0 U							

DRO + ORO (mg/kg)

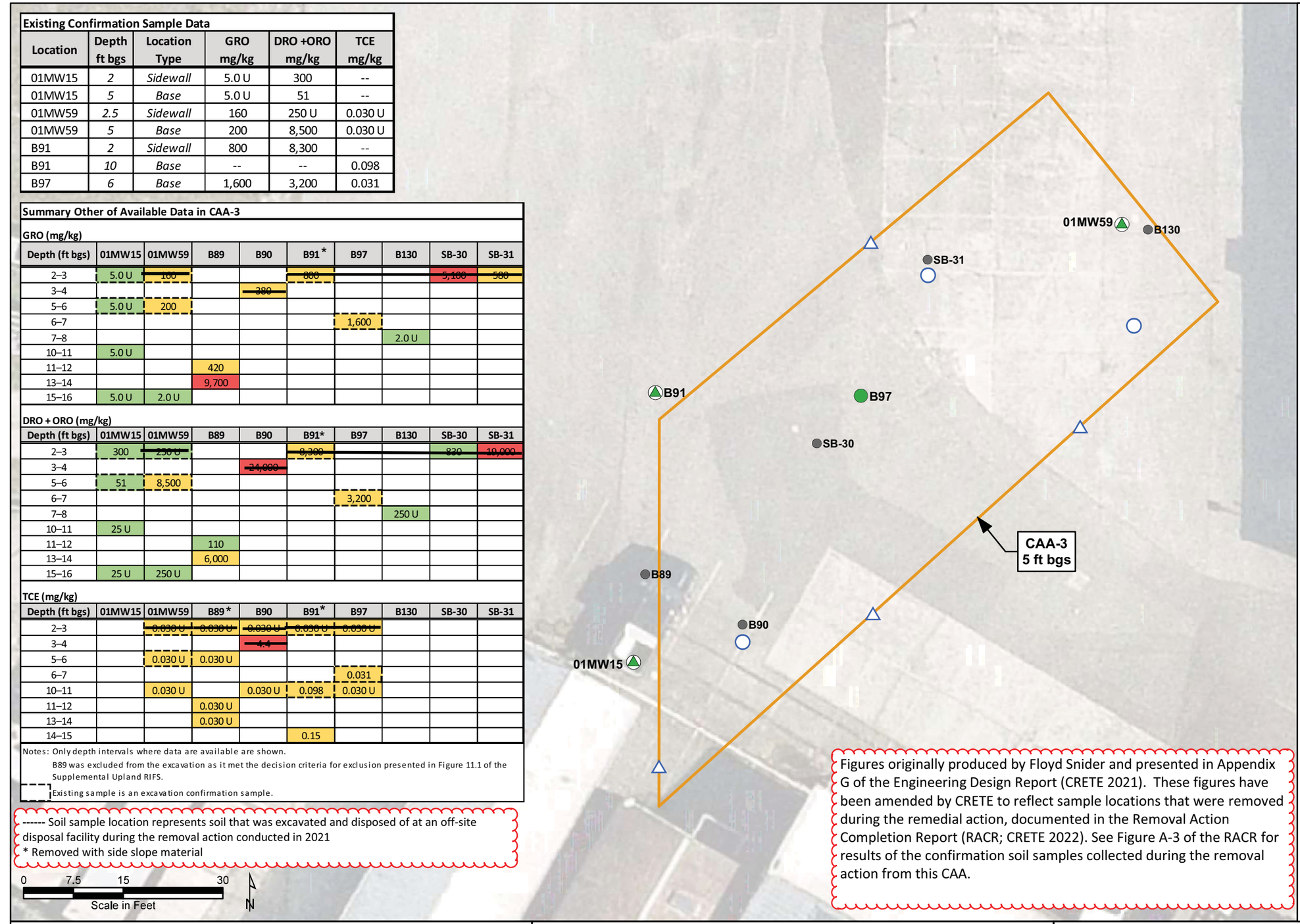
Depth (ft bgs)	01MW15	01MW59	B89	B90	B91*	B97	B130	SB-30	SB-31
2–3	300	~~250 U~~			~~8,300~~			~~830~~	~~10,000~~
3–4				~~24,000~~					
5–6	51	8,500							
6–7						3,200			
7–8							250 U		
10–11	25 U								
11–12			110						
13–14			6,000						
15–16	25 U	250 U							

TCE (mg/kg)

Depth (ft bgs)	01MW15	01MW59	B89*	B90	B91*	B97	B130	SB-30	SB-31
2–3		~~0.030 U~~	~~0.030 U~~	~~0.030 U~~	~~0.030 U~~	~~0.030 U~~			
3–4				~~4.4~~					
5–6		0.030 U	0.030 U						
6–7						0.031			
10–11		0.030 U		0.030 U	0.098	0.030 U			
11–12			0.030 U						
13–14			0.030 U						
14–15					0.15				

Notes: Only depth intervals where data are available are shown.
B89 was excluded from the excavation as it met the decision criteria for exclusion presented in Figure 11.1 of the Supplemental Upland RIFS.
Existing sample is an excavation confirmation sample.

------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021
* Removed with side slope material



Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-3 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

- Excavation Area Boundary
- Other Sample Location

Existing Confirmation Sample

- Base
- Sidewall
- Sidewall and Base

Proposed Confirmation Sample

- Base
- Sidewall

Highlighted Text

- Result Does Not Exceed CULs(1)
- Result Greater Than CULs(1)
- Result Greater Than RELs

Soil Remediation Levels
GRO: 5,000 mg/kg
DRO+ORO: 12,000 mg/kg
TCE: 1 mg/kg

Notes:
1. The CUL for GRO in soil is 30 mg/kg and the CUL for DRO+ORO in soil is 2,000 mg/kg.
- The goal of this excavation is to remove scattered petroleum- contaminated soil greater than the RELs and localized collocated benzene and TCE. Soil contamination in this area does not appear to be contributing to groundwater contamination and therefore the excavation will not be expanded unless there is an exceedance of the REL for GRO or total DRO and ORO in a sidewall sample. Confirmation samples will supplement existing data to document the concentrations that will remain in place. A pavement cap and institutional controls will reduce risk of direct contact with contaminated soil.
- Sidewall samples will be collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- TCE will be analyzed at the base sample north of and the two sidewall samples south and east of the single detected REL exceedance at B90 in order to confirm that the excavation has removed the lateral extent of TCE exceeding the REL.TCE exceeding the REL is delineated vertically and in the remaining lateral directions by existing sample results.
- 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:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
ORO= Oil-range organics
REL = Remediation level

Qualifier:
U = Analyte is not detected at the associated reporting limit.

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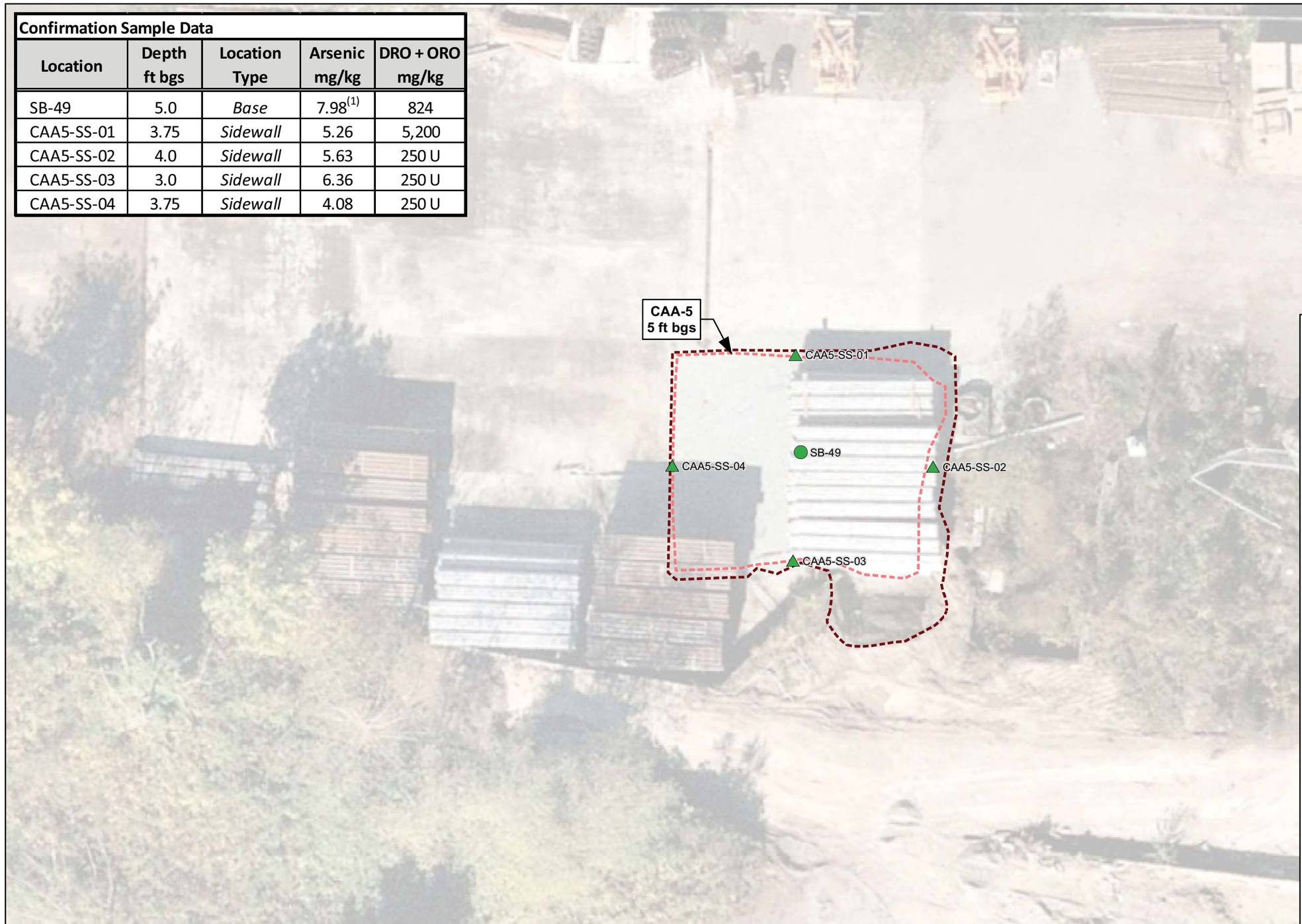
Figure A-6
CAA-3 Excavation Area Sampling Plan

I:\GIS\Projects\Cantera-TOC\MXD\Eng Design\Compliance Sampling\Figure G-4 CAA-3 Excavation Area Sampling Plan.mxd
5/20/2021

Confirmation Sample Data				
Location	**Depth ft bgs**	**Location Type**	**Arsenic mg/kg**	**DRO + ORO mg/kg**
SB-49	5.0	*Base*	7.98[(1)]	824
CAA5-SS-01	3.75	*Sidewall*	5.26	5,200
CAA5-SS-02	4.0	*Sidewall*	5.63	250 U
CAA5-SS-03	3.0	*Sidewall*	6.36	250 U
CAA5-SS-04	3.75	*Sidewall*	4.08	250 U



Legend

Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary
- Top of Slope
- Toe of Slope

Soil Cleanup Levels
Arsenic: 7.3 mg/kg[(1)]
DRO+ORO: 2,000 mg/kg

Soil Remediation Level
DRO+ORO: 12,000 mg/kg

Notes:
1. The cleanup level for Arsenic is based on natural background.

· Sidewall samples were collected at the depth with the most significant impacts based on existing data and field observations during excavation.
· Orthoimagery obtained from Nearmap, 2021.

Abbreviations:
CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
ORO= Oil-range organics

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet

N

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Seattle, Washington

Figure A-7
CAA-5 Excavation Area Confirmation Soil Sample Results

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1/18/2022

Existing Confirmation Sample Data

Location	Depth ft bgs	Location Type	Arsenic mg/kg	DRO + ORO mg/kg
SB-49	5	*Base*	8(1)	820

Summary Other of Available Data in CAA-5

Arsenic (mg/kg)

Depth (ft bgs)	MW03	MW04	SB-49
0–1		~~3.2~~	
2–3			~~6.4~~
5–6			8.0
6–7	9.8		
10–11		2.1	1.4
12–13	1.4		
15–16			1.8
16–17	2.0		
22–23		2.4	

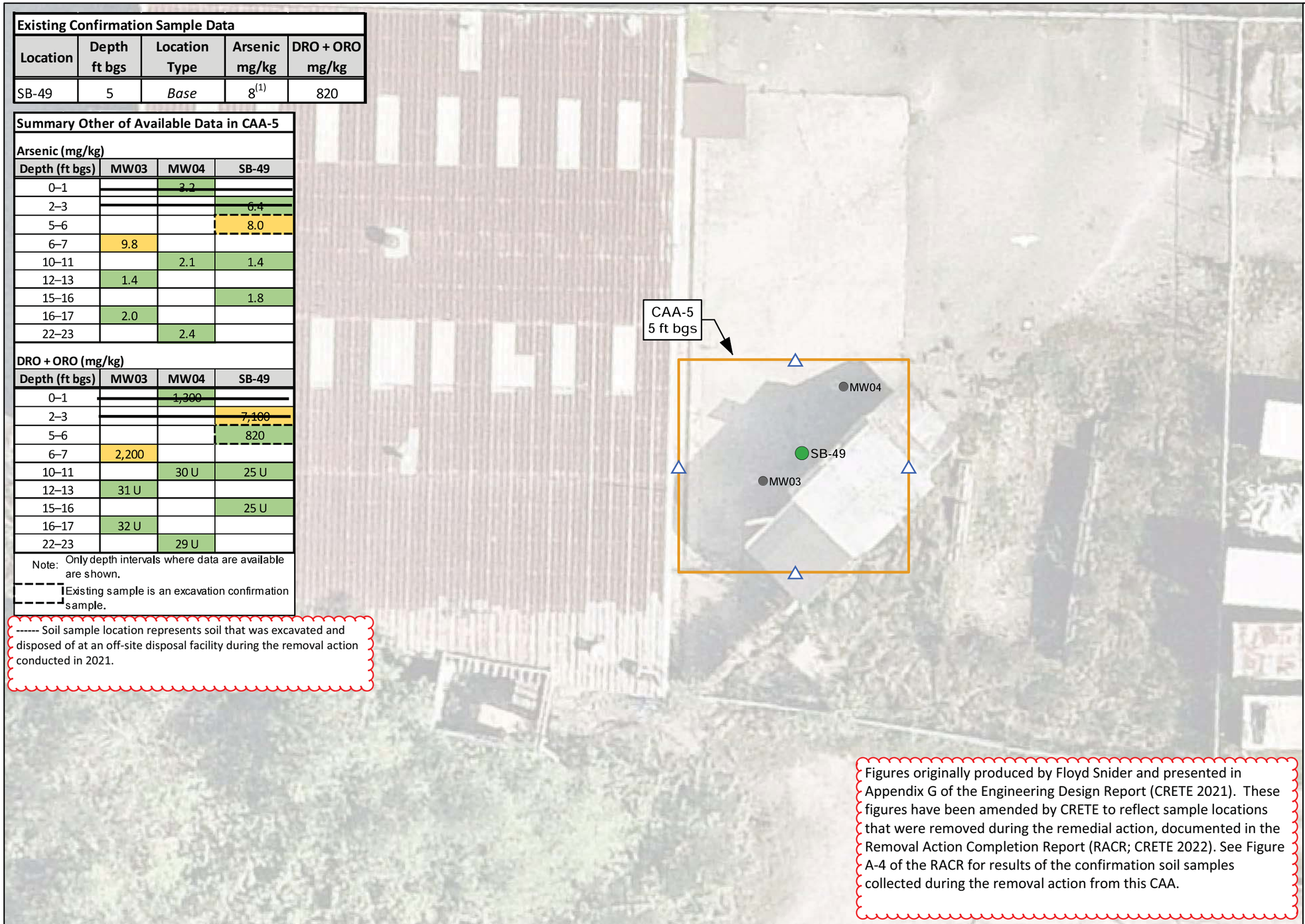
DRO + ORO (mg/kg)

Depth (ft bgs)	MW03	MW04	SB-49
0–1		~~1,300~~	
2–3			~~7,100~~
5–6			820
6–7	2,200		
10–11		30 U	25 U
12–13	31 U		
15–16			25 U
16–17	32 U		
22–23		29 U	

Note: Only depth intervals where data are available are shown.

Existing sample is an excavation confirmation sample.

------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021.



Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-4 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

- Excavation Area Boundary
- Other Sample Location

Existing Confirmation Sample

- Base

Proposed Confirmation Sample

- Sidewall

Highlighted Text

- Result Does Not Exceed CULs
- Result Greater Than CULs

Soil Cleanup Levels
Arsenic: 7.3 mg/kg(1)
DRO+ORO: 2,000 mg/kg

Soil Remediation Level
DRO+ORO: 12,000 mg/kg

Notes:
1. The CUL for Arsenic is based on natural background. Arsenic leaching to groundwater is strongly influenced by the soil's redox potential, which is biased toward reducing conditions in the presence of elevated petroleum concentrations. Removing petroleum within CAA-5 will restore the soil's natural geochemical conditions and protect groundwater.

- The goal of this excavation is to remove localized total DRO and ORO- and arsenic- contaminated soil to improve perched groundwater quality. There are no exceedances of the REL for total DRO and ORO and therefore the excavation will not be expanded unless there is an exceedance of the REL in a sidewall sample. Confirmation samples will supplement existing data to document the concentrations that will remain in place. A pavement cap and institutional controls will reduce risk of direct contact with contaminated soil.
- Sidewall samples will be collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- 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:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
ORO= Oil-range organics
REL = Remediation level

0 7.5 15 30
Scale in Feet

N

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Figure A-8
CAA-5 Excavation Area Sampling Plan

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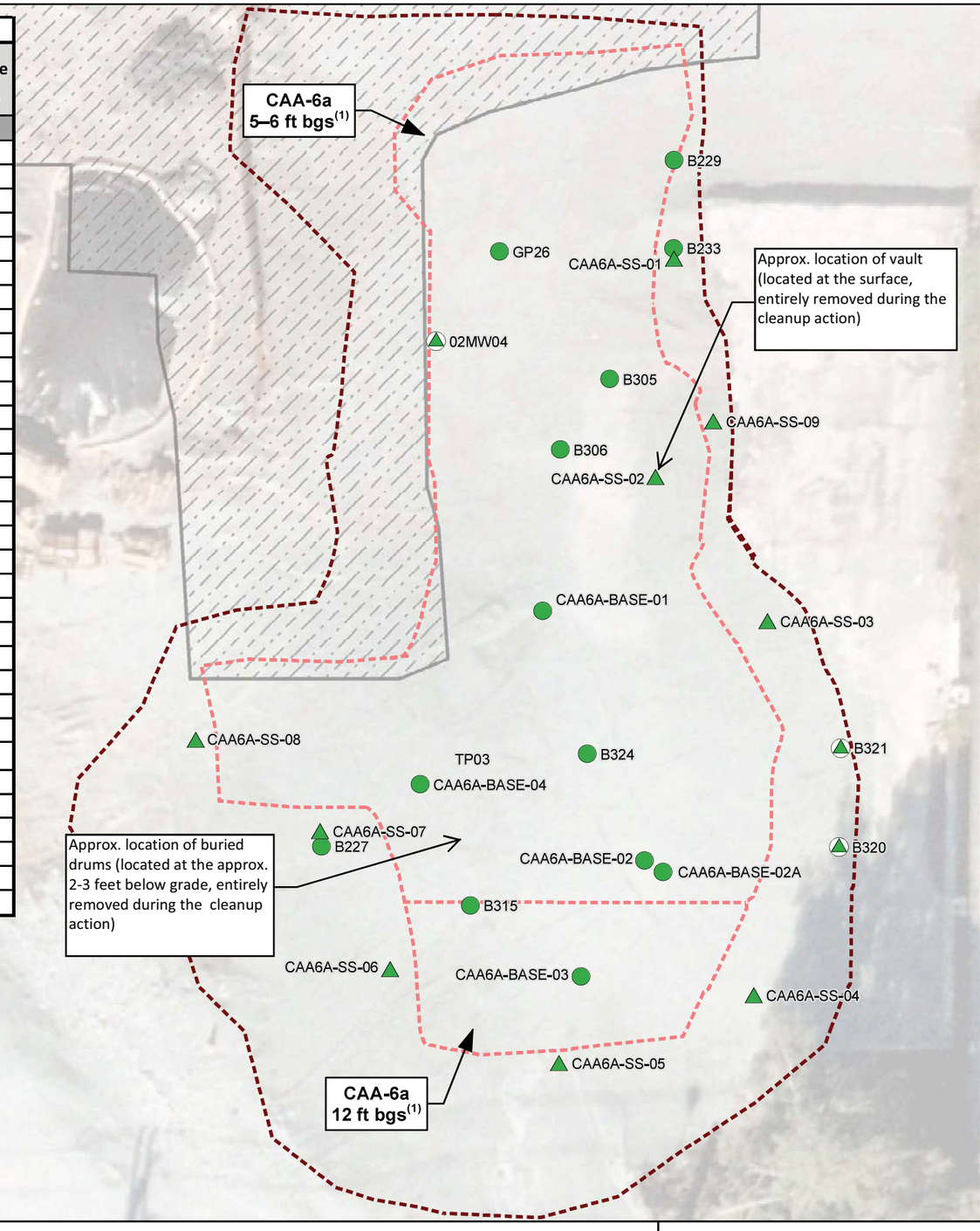
4/30/2021

Confirmation Sample Data							
Location	**Depth ft bgs**	**Location Type**	**GRO mg/kg**	**DRO mg/kg**	**ORO mg/kg**	**DRO + ORO mg/kg**	**Benzene mg/kg**
CAA-6a							
5-6 ft bgs excavation [(1)]							
02MW04	2.0	*Sidewall*	5 U	10 U	25 U	25 U	0.05 U
02MW04	5.0	*Base*	6.88	10 U	25 U	25 U	0.05 U
B227	5.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
B229	5.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
B233	5.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
B305	5.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
B306	5.5	*Base*	2 U	50 U	250 U	250 U	0.02 U
B320	3.5	*Sidewall*	2 U	50 U	250 U	250 U	0.02 U
B320	6.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
B321	3.5	*Sidewall*	2 U	50 U	250 U	250 U	0.02 U
B321	6.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
B324	5.0	*Base*	2 U	50 U	250 U	250 U	0.02 U
GP26	5.0	*Base*	19	50 U	250 U	250 U	0.02 U
CAA6A-BASE-01	7.7	*Base*	X	98	250 U	98	0.02 U
CAA6A-BASE-01-4	8.1	*Base*	5 U	--	--	--	--
CAA6A-BASE-02	8.6	*Base*	5 U	50 U	250 U	250 U	X
CAA6A-BASE-02A-8	9.2	*Base*	--	--	--	--	0.02 U
CAA6A-BASE-04	14	*Base*	5 U	50 U	250 U	250 U	0.02 U
CAA6A-SS-01	4.0	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
CAA6A-SS-02	2.5	*Sidewall*	X	510	380	890	0.02 U
CAA6A-SS-09	3.7	*Sidewall*	5 U	--	--	--	--
CAA6A-SS-03	3.0	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
CAA6A-SS-07	10.5	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
CAA6A-SS-08	9.8	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
12 ft bgs excavation [(1)]							
B315	12.5	*Base*	2 U	50 U	250 U	250 U	0.02 U
CAA6A-BASE-03	12.1	*Base*	5 U	50 U	250 U	250 U	X
CAA6A-BASE-03-4	12.5	*Base*	--	--	--	--	0.02 U
CAA6A-SS-04	5.0	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
CAA6A-SS-05	10.7	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
CAA6A-SS-06	12.3	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U



Legend

Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary
- Top of Slope
- Toe of Slope

Other Site Features
- 2013 TPH Excavation

Soil Cleanup Levels
GRO: 30 mg/kg
DRO: 570 mg/kg
ORO: 1,600 mg/kg
DRO+ORO: 2,000 mg/kg
Benzene: 0.02 mg/kg

Notes:
1. The ground surface is sloped and excavation depths varied accordingly, extending to a maximum depth of approximately 16 feet bgs at the southern extent of CAA-6a. The average target excavation depths are shown.

- An "X" in the data table indicates a failed result for a confirmation sample that also met the CUL for at least one analyte. The sample was over excavated and an additional sample was collected and analyzed only for the failed analytes.
- Only in-situ confirmation sample data are shown in the embedded table, refer to the RACR for all performance and confirmation sample results.
- Sidewall samples were collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- Orthoimagery obtained from Nearmap, 2021.

Abbreviations:
CAA = Cleanup Action Area
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
ORO= Oil-range organics
REL = Remediation level
RACR = Remedial Action Completion Report

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet

N

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Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-9
CAA-6a Excavation Area Confirmation Soil Sample Results

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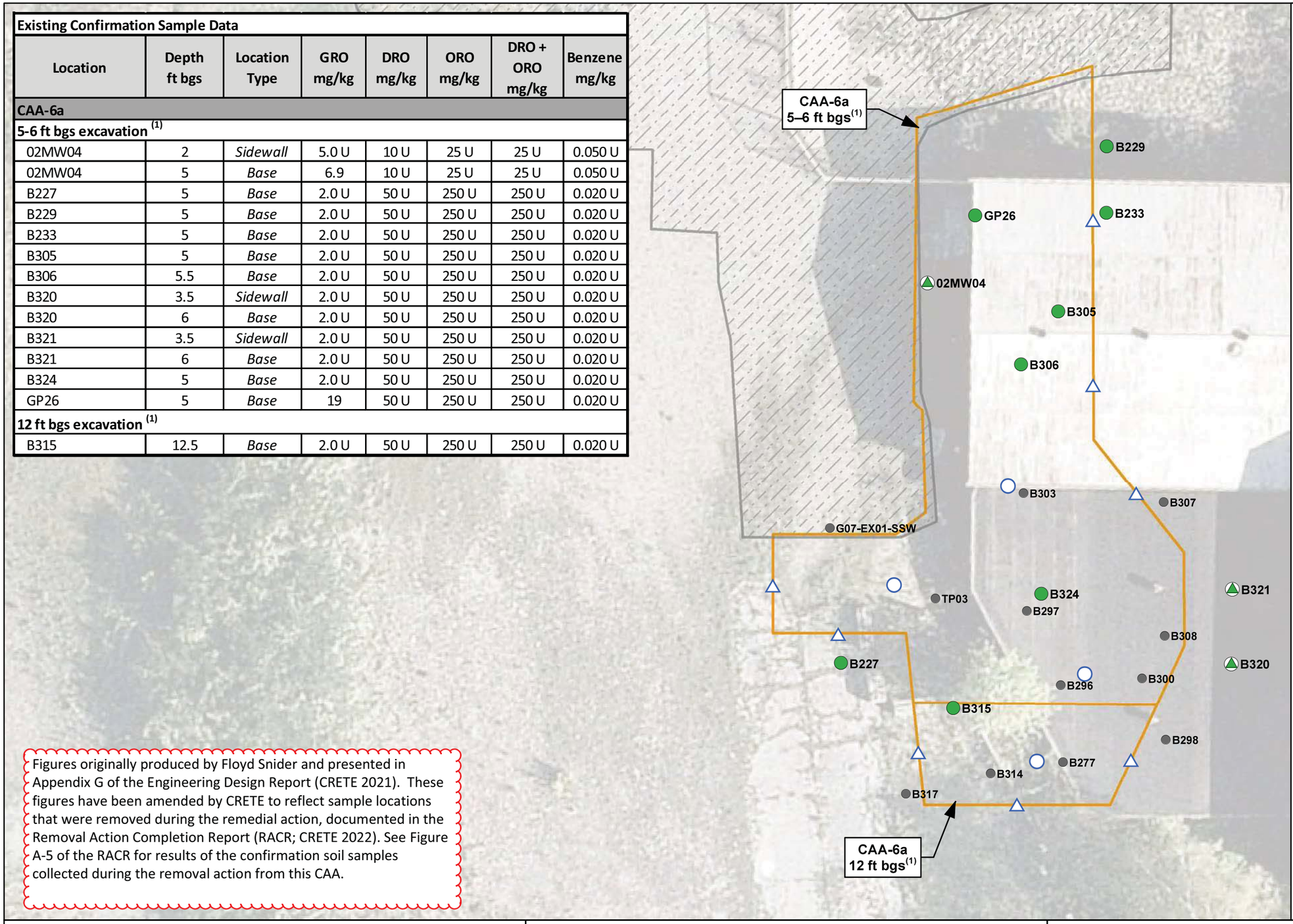
1/24/2022

Existing Confirmation Sample Data							
Location	**Depth ft bgs**	**Location Type**	**GRO mg/kg**	**DRO mg/kg**	**ORO mg/kg**	**DRO + ORO mg/kg**	**Benzene mg/kg**
CAA-6a							
5-6 ft bgs excavation [(1)]							
02MW04	2	*Sidewall*	5.0 U	10 U	25 U	25 U	0.050 U
02MW04	5	*Base*	6.9	10 U	25 U	25 U	0.050 U
B227	5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B229	5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B233	5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B305	5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B306	5.5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B320	3.5	*Sidewall*	2.0 U	50 U	250 U	250 U	0.020 U
B320	6	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B321	3.5	*Sidewall*	2.0 U	50 U	250 U	250 U	0.020 U
B321	6	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B324	5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
GP26	5	*Base*	19	50 U	250 U	250 U	0.020 U
12 ft bgs excavation [(1)]							
B315	12.5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U



Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-5 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

- Excavation Area Boundary

Existing Confirmation Sample

- Base
- Sidewall
- Sidewall and Base

Proposed Confirmation Sample

- Base
- Sidewall

Other Site Features

- 2013 TPH Excavation
- Other Sample Location

Highlighted Text

- Result Does Not Exceed CULs
- Result Greater Than CULs

Soil Cleanup Levels

GRO: 30 mg/kg
DRO: 570 mg/kg
ORO: 1,600 mg/kg
DRO+ORO: 2,000 mg/kg
Benzene: 0.020 mg/kg

Notes:
1. The ground surface is sloped and excavation depths will vary accordingly, extending to a maximum depth of approximately 16 feet bgs at the southern extent of CAA-6a. The average target excavation depths are shown.
   - Final excavation limits will be determined in the field during implementation and will be based on field observations, screening, and confirmation data results.
   - Sidewall samples will be collected at the depth with the most significant impacts based on existing data and field observations during excavation.
   - 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:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
ORO= Oil-range organics
REL = Remediation level

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet

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Figure A-10 (1 of 2)
CAA-6a Excavation Area Sampling Plan

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4/29/2021

Summary of Other Available Data in CAA-6a

GRO (mg/kg)

	5-6 ft bgs Excavation													12 ft bgs Excavation				
Depth (ft bgs)	B233	B296	B297	B300	B303	B305	B306	B307*	B308	B324	G07-EX01-SSW	GP26	TP03	B277	B298*	B314	B315	B317*
0–1		100	49		200	46												
1–2									240									
2–3				280											2.0 U			
3–4							65											
4–5	2.0 U					2.0 U		2.0 U		2.0 U		19						
5–6				10			2.0 U						42		2.0 U			
6–7										2.0 U	670							
8–9														280				
9–10	2.0 U																	
10–11													2.0 U					
11–12												3.0				420	2.0 U	
14–15																2.0 U	2.0 U	2.0 U

DRO (mg/kg)

	5-6 ft bgs Excavation													12 ft bgs Excavation				
Depth (ft bgs)	B233	B296	B297	B300	B303	B305	B306	B307*	B308	B324	G07-EX01-SSW	GP26	TP03	B277	B298*	B314	B315	B317*
0–1		1,700	330		710	280												
1–2									1,980									
2–3				2,500											50 U			
3–4							1,200											
4–5	50 U					50 U		50 U		50 U		50 U						
5–6				50 U			50 U						50 U		50 U			
6–7										50 U	490							
8–9														2,000				
9–10	50 U																	
10–11													50 U					
11–12												50 U				780	50 U	
14–15																50 U	50 U	50 U

ORO (mg/kg)

	5-6 ft bgs Excavation													12 ft bgs Excavation				
Depth (ft bgs)	B233	B296	B297	B300	B303	B305	B306	B307*	B308	B324	G07-EX01-SSW	GP26	TP03	B277	B298*	B314	B315	B317*
0–1		13,000	1,800		3,400	250 U												
1–2									12,000									
2–3				20,000											250 U			
3–4							1,200											
4–5	250 U					250 U		250 U		250 U		250 U						
5–6				250 U			250 U						250 U		250 U			
6–7										250 U	250 U							
8–9														14,000				
9–10	250 U																	
10–11													250 U					
11–12												250 U				5,300	250 U	
14-15																250 U	250 U	250 U

DRO + ORO (mg/kg)

	5-6 ft bgs Excavation													12 ft bgs Excavation				
Depth (ft bgs)	B233	B296	B297	B300	B303	B305	B306	B307*	B308	B324	G07-EX01-SSW	GP26	TP03	B277	B298*	B314	B315	B317*
0–1		15,000	2,100		4,100	250 U												
1–2									14,000									
2–3				23,000											250 U			
3–4							2,400											
4–5	250 U					250 U		250 U		250 U		250 U						
5–6				250 U			250 U						250 U		250 U			
6–7										250 U	490							
8–9														16,000				
9–10	250 U																	
10–11													250 U					
11–12												250 U				6,300	250 U	
14-15																250 U	250 U	250 U

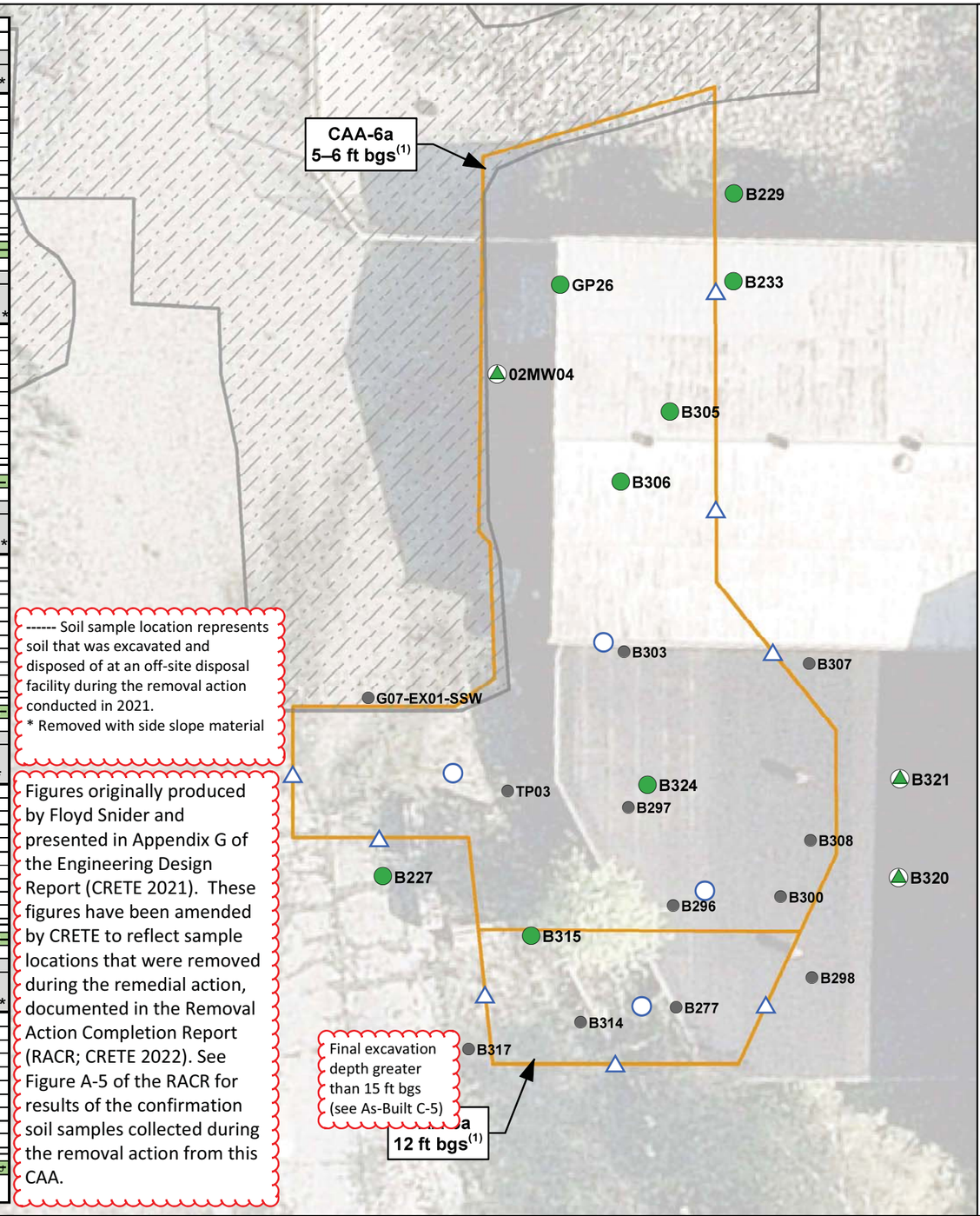
Benzene (mg/kg)

	5-6 ft bgs Excavation													12 ft bgs Excavation				
Depth (ft bgs)	B233	B296	B297	B300	B303	B305	B306	B307*	B308	B324	G07-EX01-SSW	GP26	TP03	B277	B298*	B314	B315	B317*
0–1		0.020 U	0.020 U		0.020 U	0.020 U												
1–2									0.020 U									
2–3				0.21											0.020 U			
3–4							0.020 U											
4–5	0.020 U					0.020 U		0.020 U		0.020 U		0.020 U						
5–6				0.070			0.020 U						0.020 U		0.020 U			
6–7										0.020 U	0.020 U							
8–9														0.19				
9–10	0.020 U																	
10–11													0.020 U					
11–12												0.020 U				0.020 U	0.020 U	
14–15																0.064	0.020 U	0.020 U

Note: Only depth intervals where data are available are shown.
Existing sample is an excavation confirmation sample.

------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021.
* Removed with side slope material

Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-5 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.



Legend

- Excavation Area Boundary

Existing Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Proposed Confirmation Sample
- Base
- Sidewall

Other Site Features
- 2013 TPH Excavation
- Other Sample Location

Highlighted Text
- Result Does Not Exceed CULs
- Result Greater Than CULs

Soil Cleanup Levels
GRO: 30 mg/kg
DRO: 570 mg/kg
ORO: 1,600 mg/kg
DRO+ORO: 2,000 mg/kg
Benzene: 0.020 mg/kg

Notes:
1. The ground surface is sloped and excavation depths will vary accordingly, extending to a maximum depth of approximately 16 feet bgs at the southern extent of CAA-6a. The average target excavation depths are shown.
- Final excavation limits will be determined in the field during implementation and will be based on field observations, screening, and confirmation data results.
- Sidewall samples will be collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- 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:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
ORO= Oil-range organics
REL = Remediation level

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet

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Figure A-11 (2 of 2)
CAA-6a Excavation Area Sampling Plan

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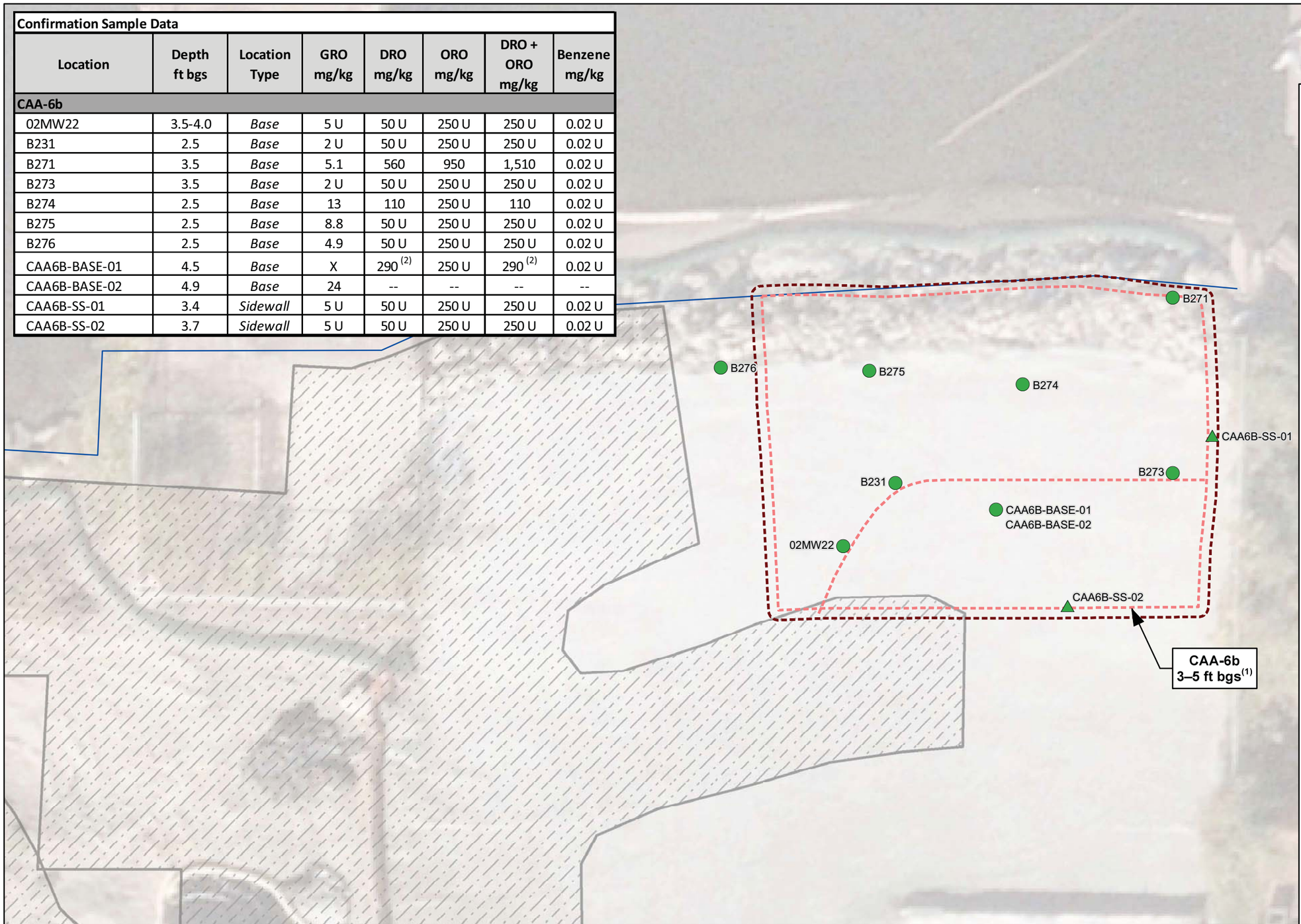
6/18/2021

Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO mg/kg	ORO mg/kg	DRO + ORO mg/kg	Benzene mg/kg
CAA-6b							
02MW22	3.5-4.0	*Base*	5 U	50 U	250 U	250 U	0.02 U
B231	2.5	*Base*	2 U	50 U	250 U	250 U	0.02 U
B271	3.5	*Base*	5.1	560	950	1,510	0.02 U
B273	3.5	*Base*	2 U	50 U	250 U	250 U	0.02 U
B274	2.5	*Base*	13	110	250 U	110	0.02 U
B275	2.5	*Base*	8.8	50 U	250 U	250 U	0.02 U
B276	2.5	*Base*	4.9	50 U	250 U	250 U	0.02 U
CAA6B-BASE-01	4.5	*Base*	X	290 (2)	250 U	290 (2)	0.02 U
CAA6B-BASE-02	4.9	*Base*	24	--	--	--	--
CAA6B-SS-01	3.4	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U
CAA6B-SS-02	3.7	*Sidewall*	5 U	50 U	250 U	250 U	0.02 U



Legend

Confirmation Sample
- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary
- Top of Slope
- Toe of Slope
- 2013 TPH Excavation

Other Site Features
- Ordinary High Water Mark

Soil Cleanup Levels
GRO: 30 mg/kg
DRO: 570 mg/kg
ORO: 1,600 mg/kg
DRO+ORO: 2,000 mg/kg
Benzene: 0.02 mg/kg

Notes:
1. The ground surface is sloped and excavation depth varied accordingly.
2. The sample chromatographic pattern does not resemble the fuel standard used for quantitation of the diesel component in this sum.

- An "X" in the data table indicates a failed result for a confirmation sample that also met the CUL for at least one analyte. The sample was over excavated and an additional sample was collected and analyzed only for the failed analytes.
- Only in-situ confirmation sample data are shown in the embedded table, refer to the RACR for all performance and confirmation sample results.
- Sidewall samples were collected at the depth with the most significant impacts based on existing data and field observations during excavation.
  Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2021.

Abbreviations:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
ORO = Oil-range organics
RACR = Remedial Action Completion Report

Qualifier:
U = Analyte is not detected at the associated reporting limit.

0 5 10 20
Scale in Feet

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Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-12
CAA-6b Excavation Area Confirmation Soil Sample Results

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1/25/2022

Existing Confirmation Sample Data

Location	Depth ft bgs	Location Type	GRO mg/kg	DRO mg/kg	ORO mg/kg	DRO + ORO mg/kg	Benzene mg/kg
CAA-6b							
02MW22	3.5-4	*Base*	5.0 U	50 U	250 U	250 U	0.020 U
B231	2.5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B271	3.5	*Base*	5.1	560	950	1,500	0.020 U
B273	3.5	*Base*	2.0 U	50 U	250 U	250 U	0.020 U
B274	2.5	*Base*	13	110	250 U	110	0.020 U
B275	2.5	*Base*	8.8	50 U	250 U	250 U	0.020 U
B276	2.5	*Base*	4.9	50 U	250 U	250 U	0.020 U

Summary of Other Available Data in CAA-6b

GRO (mg/kg)

Depth (ft bgs)	02MW20	02MW22	B231	B271	I03-EX01-NSW01
1–2	~~440~~	~~340~~			
2–3			~~2.0 U~~	~~340~~	
3–4		5 U		5.1	
5–6			2.0 U		2.0 U

DRO (mg/kg)

Depth (ft bgs)	02MW20	02MW22	B231	B271	I03-EX01-NSW01
1–2	~~1,400~~	~~50 U~~			
2–3			~~50 U~~	~~2,800~~	
3–4		50 U		560	
5–6			50 U		50 U

ORO (mg/kg)

Depth (ft bgs)	02MW20	02MW22	B231	B271	I03-EX01-NSW01
1–2	~~2,000~~	~~250 U~~			
2–3			~~250 U~~	~~1,600~~	
3–4		250 U		950	
5–6			250 U		250 U

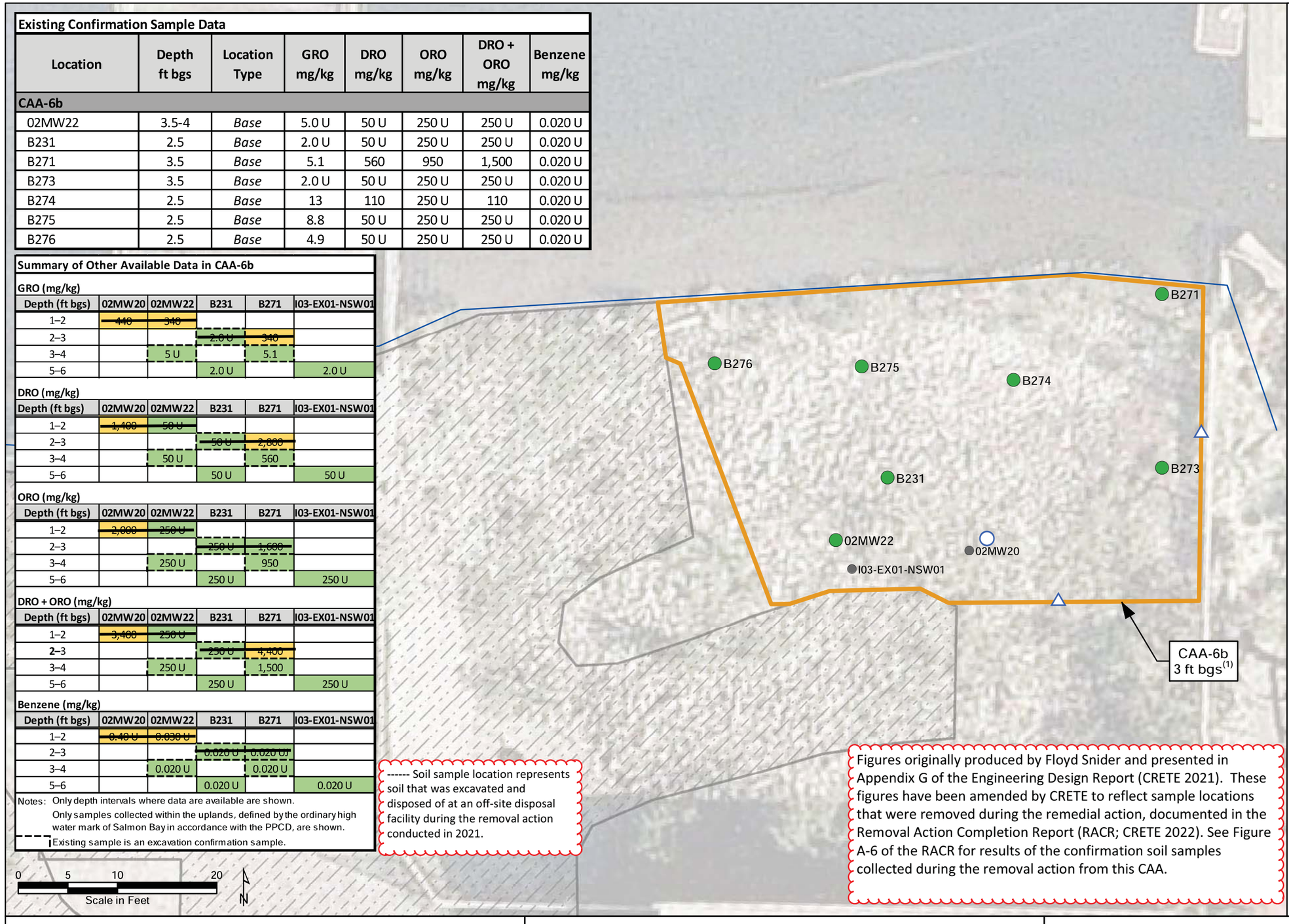
DRO + ORO (mg/kg)

Depth (ft bgs)	02MW20	02MW22	B231	B271	I03-EX01-NSW01
1–2	~~3,400~~	~~250 U~~			
2–3			~~250 U~~	~~4,400~~	
3–4		250 U		1,500	
5–6			250 U		250 U

Benzene (mg/kg)

Depth (ft bgs)	02MW20	02MW22	B231	B271	I03-EX01-NSW01
1–2	~~0.40 U~~	~~0.030 U~~			
2–3			~~0.020 U~~	~~0.020 U~~	
3–4		0.020 U		0.020 U	
5–6			0.020 U		0.020 U

Notes: Only depth intervals where data are available are shown.
Only samples collected within the uplands, defined by the ordinary high water mark of Salmon Bay in accordance with the PPCD, are shown.
Existing sample is an excavation confirmation sample.



------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021.

Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-6 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

- Excavation Area Boundary
- Existing Confirmation Sample
  - Base
  - Sidewall
  - Sidewall and Base
- Proposed Confirmation Sample
  - Base
  - Sidewall
- Other Site Features
  - 2013 TPH Excavation
  - Other Sample Location
  - Ordinary High Water Mark
- Highlighted Text
  - Result Does Not Exceed CULs
  - Result Greater Than CULs

Soil Cleanup Levels
GRO: 30 mg/kg
DRO: 570 mg/kg
ORO: 1,600 mg/kg
DRO+ORO: 2,000 mg/kg
Benzene: 0.020 mg/kg

Notes:
1. The ground surface is sloped and excavation depth will vary accordingly.
- Final excavation limits will be determined in the field during implementation and will be based on field observations, screening, and confirmation data results.
- The northern extent of the excavation is the ordinary high water mark, which is the demarcation between the uplands and the Salmon bay sediments as defined in the PPCD.
- An additional sidewall sample may be collected along the western excavation extent if field evidence of the former excavation isn't observed.
- Sidewall samples will be collected at the depth with the most significant impacts based on existing data and field observations during excavation.
- 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:
CAA = Cleanup Action Area
CUL = Cleanup level
DRO = Diesel-range organics
ft bgs = Feet below ground surface
GRO = Gasoline-range organics
ORO = Oil-range organics
PPCD = Prospective Purchaser Consent Decree
REL = Remediation level

Qualifiers:
U = Analyte is not detected at the associated reporting limit.
UJ = Analyte is not detected at the associated reporting limit, which is an estimate.

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Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-13
CAA-6b Excavation Area Sampling Plan

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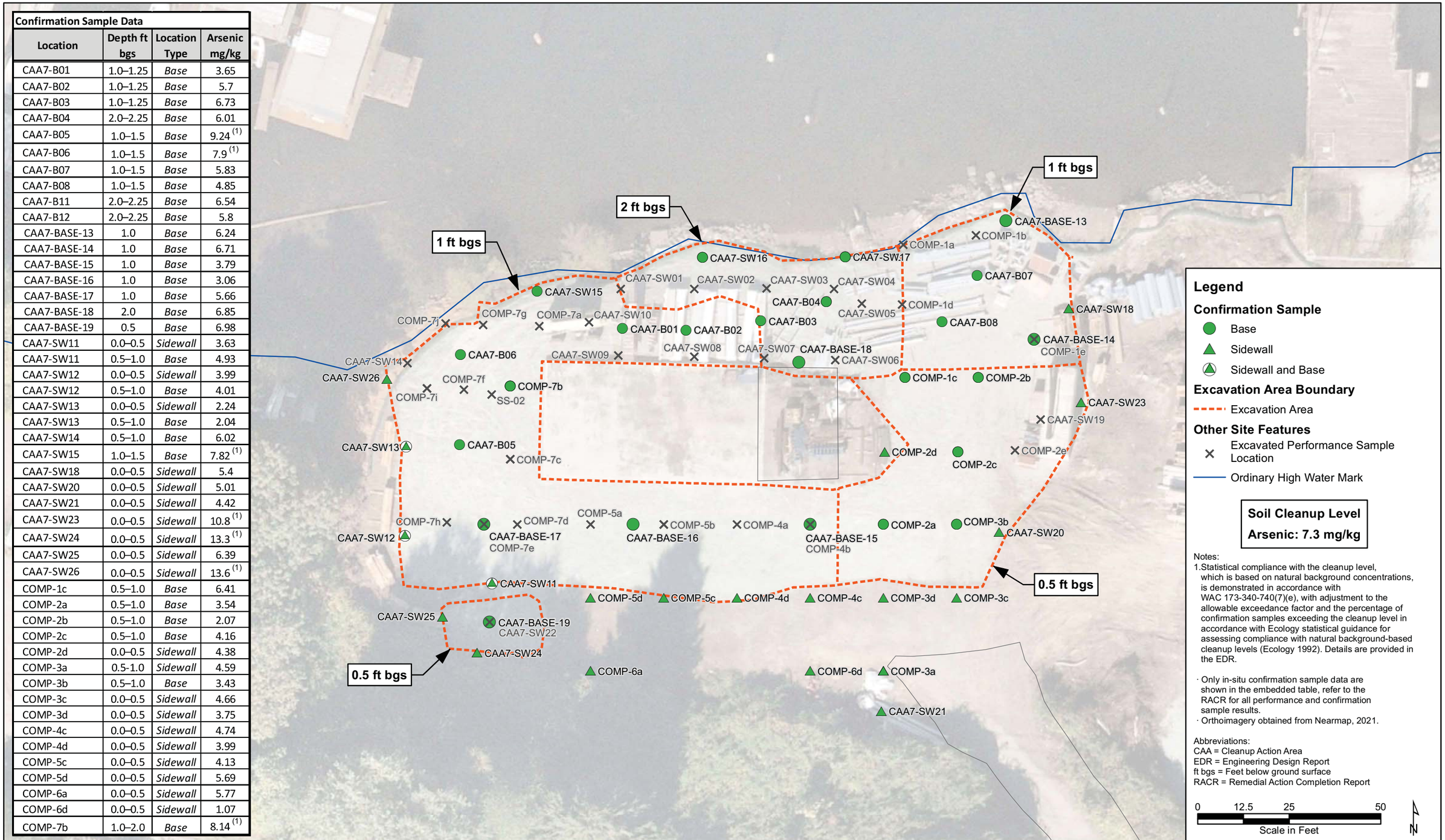
4/30/2021

Confirmation Sample Data			
Location	Depth ft bgs	Location Type	Arsenic mg/kg
CAA7-B01	1.0–1.25	*Base*	3.65
CAA7-B02	1.0–1.25	*Base*	5.7
CAA7-B03	1.0–1.25	*Base*	6.73
CAA7-B04	2.0–2.25	*Base*	6.01
CAA7-B05	1.0–1.5	*Base*	9.24 (1)
CAA7-B06	1.0–1.5	*Base*	7.9 (1)
CAA7-B07	1.0–1.5	*Base*	5.83
CAA7-B08	1.0–1.5	*Base*	4.85
CAA7-B11	2.0–2.25	*Base*	6.54
CAA7-B12	2.0–2.25	*Base*	5.8
CAA7-BASE-13	1.0	*Base*	6.24
CAA7-BASE-14	1.0	*Base*	6.71
CAA7-BASE-15	1.0	*Base*	3.79
CAA7-BASE-16	1.0	*Base*	3.06
CAA7-BASE-17	1.0	*Base*	5.66
CAA7-BASE-18	2.0	*Base*	6.85
CAA7-BASE-19	0.5	*Base*	6.98
CAA7-SW11	0.0–0.5	*Sidewall*	3.63
CAA7-SW11	0.5–1.0	*Base*	4.93
CAA7-SW12	0.0–0.5	*Sidewall*	3.99
CAA7-SW12	0.5–1.0	*Base*	4.01
CAA7-SW13	0.0–0.5	*Sidewall*	2.24
CAA7-SW13	0.5–1.0	*Base*	2.04
CAA7-SW14	0.5–1.0	*Base*	6.02
CAA7-SW15	1.0–1.5	*Base*	7.82 (1)
CAA7-SW18	0.0–0.5	*Sidewall*	5.4
CAA7-SW20	0.0–0.5	*Sidewall*	5.01
CAA7-SW21	0.0–0.5	*Sidewall*	4.42
CAA7-SW23	0.0–0.5	*Sidewall*	10.8 (1)
CAA7-SW24	0.0–0.5	*Sidewall*	13.3 (1)
CAA7-SW25	0.0–0.5	*Sidewall*	6.39
CAA7-SW26	0.0–0.5	*Sidewall*	13.6 (1)
COMP-1c	0.5–1.0	*Base*	6.41
COMP-2a	0.5–1.0	*Base*	3.54
COMP-2b	0.5–1.0	*Base*	2.07
COMP-2c	0.5–1.0	*Base*	4.16
COMP-2d	0.0–0.5	*Sidewall*	4.38
COMP-3a	0.5-1.0	*Sidewall*	4.59
COMP-3b	0.5–1.0	*Base*	3.43
COMP-3c	0.0–0.5	*Sidewall*	4.66
COMP-3d	0.0–0.5	*Sidewall*	3.75
COMP-4c	0.0–0.5	*Sidewall*	4.74
COMP-4d	0.0–0.5	*Sidewall*	3.99
COMP-5c	0.0–0.5	*Sidewall*	4.13
COMP-5d	0.0–0.5	*Sidewall*	5.69
COMP-6a	0.0–0.5	*Sidewall*	5.77
COMP-6d	0.0–0.5	*Sidewall*	1.07
COMP-7b	1.0–2.0	*Base*	8.14 (1)



Legend

Confirmation Sample

- Base
- Sidewall
- Sidewall and Base

Excavation Area Boundary

- Excavation Area

Other Site Features

- Excavated Performance Sample Location
- Ordinary High Water Mark

Soil Cleanup Level
Arsenic: 7.3 mg/kg

Notes:
1. Statistical compliance with the cleanup level, which is based on natural background concentrations, is demonstrated in accordance with WAC 173-340-740(7)(e), with adjustment to the allowable exceedance factor and the percentage of confirmation samples exceeding the cleanup level in accordance with Ecology statistical guidance for assessing compliance with natural background-based cleanup levels (Ecology 1992). Details are provided in the EDR.

· Only in-situ confirmation sample data are shown in the embedded table, refer to the RACR for all performance and confirmation sample results.
· Orthoimagery obtained from Nearmap, 2021.

Abbreviations:
CAA = Cleanup Action Area
EDR = Engineering Design Report
ft bgs = Feet below ground surface
RACR = Remedial Action Completion Report

0 12.5 25 50
Scale in Feet

N

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Remedial Action Completion Report
Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-14
CAA-7 Excavation Area Confirmation Soil Sample Results

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1/19/2022

Existing Confirmation Sample Data

Location	Depth ft bgs	Location Type	Arsenic mg/kg
CAA7-B01	1.0–1.25	*Base*	3.7
CAA7-B02	1.0–1.25	*Base*	5.7
CAA7-B03	1.0–1.25	*Base*	6.7
CAA7-B04	2.0–2.25	*Base*	6.0
CAA7-B05	1.0–1.5	*Base*	9.2 (1)
CAA7-B06	1.0–1.5	*Base*	7.9 (1)
CAA7-B07	1.0–1.5	*Base*	5.8
CAA7-B08	1.0–1.5	*Base*	4.9
CAA7-B11	2.0–2.25	*Base*	6.5
CAA7-B12	2.0–2.25	*Base*	5.8
CAA7-SW11	0.0–0.5	*Sidewall*	3.6
CAA7-SW11	0.5–1.0	*Base*	4.9
CAA7-SW12	0.0–0.5	*Sidewall*	4.0
CAA7-SW12	0.5–1.0	*Base*	4.0
CAA7-SW13	0.0–0.5	*Sidewall*	2.2
CAA7-SW13	0.5–1.0	*Base*	2.0
CAA7-SW14	0.5–1.0	*Base*	6.0
CAA7-SW15	1.0–1.5	*Base*	7.8 (1)
CAA7-SW18	0.0–0.5	*Sidewall*	5.4
CAA7-SW20	0.0–0.5	*Sidewall*	5.0
CAA7-SW21	0.0–0.5	*Sidewall*	4.4
CAA7-SW23	0.0–0.5	*Sidewall*	11 (1)
CAA7-SW24	0.0–0.5	*Sidewall*	13 (1)
CAA7-SW25	0.0–0.5	*Sidewall*	6.4
CAA7-SW26	0.0–0.5	*Sidewall*	14 (1)
COMP-1c	0.5–1.0	*Base*	6.4
COMP-2a	0.5–1.0	*Base*	3.5
COMP-2b	0.5–1.0	*Base*	2.1
COMP-2c	0.5–1.0	*Base*	4.2
COMP-2d	0.0–0.5	*Sidewall*	4.4
COMP-3a	0.0–0.5	*Sidewall*	16 (1)
COMP-3b	0.5–1.0	*Base*	3.4
COMP-3c	0.0–0.5	*Sidewall*	4.7
COMP-3d	0.0–0.5	*Sidewall*	3.8
COMP-4c	0.0–0.5	*Sidewall*	4.7
COMP-4d	0.0–0.5	*Sidewall*	4.0
COMP-5c	0.0–0.5	*Sidewall*	4.1
COMP-5d	0.0–0.5	*Sidewall*	5.7
COMP-6a	0.0–0.5	*Sidewall*	5.8
COMP-6d	0.0–0.5	*Sidewall*	1.1
COMP-7b	1.0–2.0	*Base*	8.1 (1)

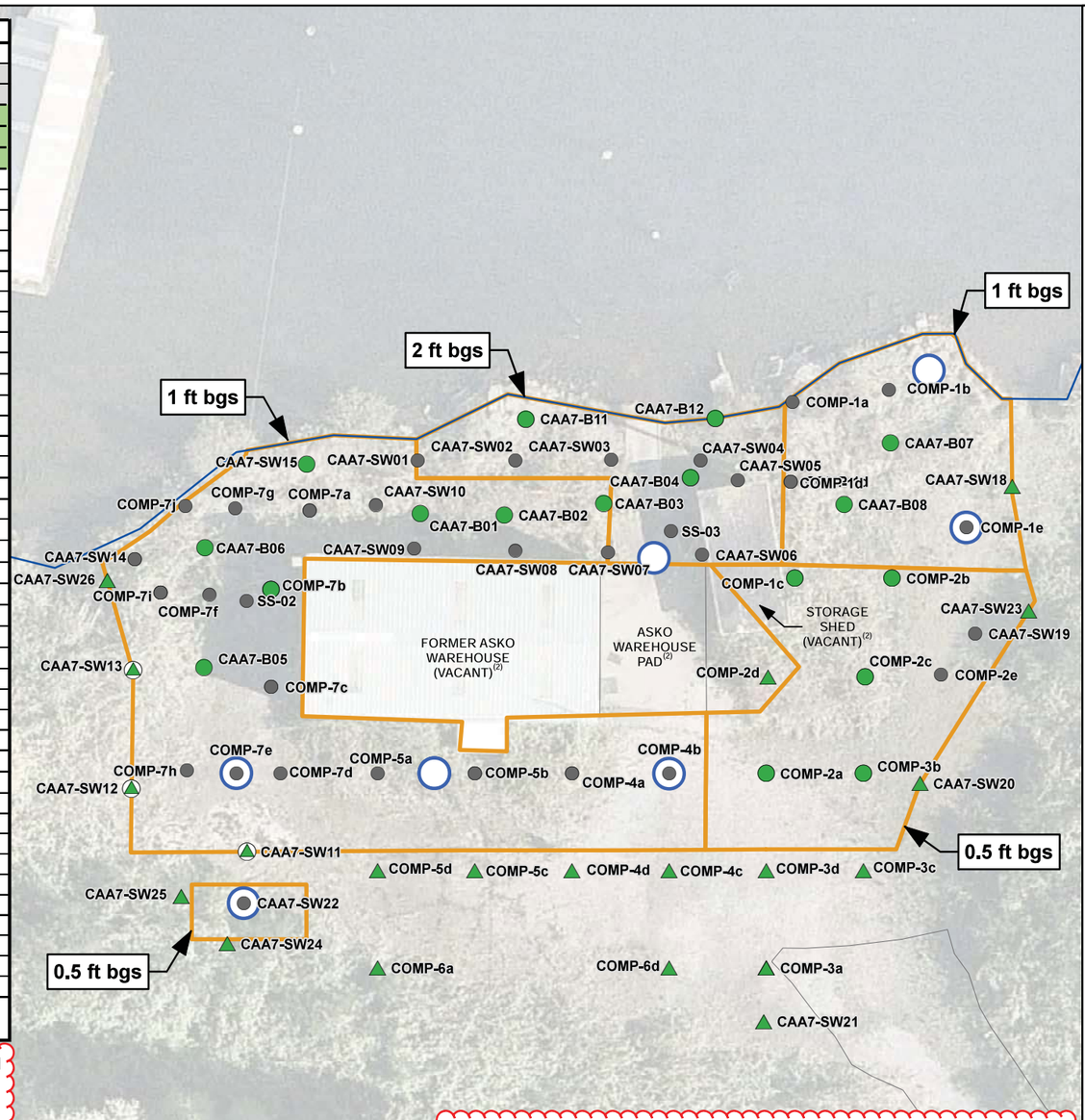
Summary of Other Available Data in CAA-7

Arsenic (mg/kg)

Location	Depth (feet bgs) 0.0–0.5	0.25–0.75	0.5–1.0	1.0–1.5	2.0-2.25
CAA7-B04				550	6.0
CAA7-B11				0	6.5
CAA7-B12				18	5.8
CAA7-SW01		35			
CAA7-SW02		15			
CAA7-SW03		150			
CAA7-SW04		700			
CAA7-SW05		160			
CAA7-SW06		250			
CAA7-SW07		550			
CAA7-SW08		6.8			
CAA7-SW09		9.5			
CAA7-SW10		7.2			
CAA7-SW14	28		6.0		
CAA7-SW19	19				
CAA7-SW22	37				
COMP-1a	10				
COMP-1b	14		12		
COMP-1c	13		6.4		
COMP-1d	13		7.5		
COMP-1e	24				
COMP-2a	16		3.5		
COMP-2b	38		2.1		
COMP-2c	150		4.2		
COMP-2e	9.5				
COMP-3a	16		4.6		
COMP-3b	18		3.4		
COMP-4a	20		7.4		
COMP-4b	130				
COMP-5a	47				
COMP-5b	12		8.7		
COMP-7a	150		36		
COMP-7b	220		88	8.1	
COMP-7c	78		8.1		
COMP-7d	110				
COMP-7e	170				
COMP-7f	39				
COMP-7g	230				
COMP-7h	91				
COMP-7i	12		11		
COMP-7j	32				
SS-02	30				
SS-03		26			

Notes: Only depth intervals where data are available are shown.
Existing sample is an excavation confirmation sample.

------ Soil sample location represents soil that was excavated and disposed of at an off-site disposal facility during the removal action conducted in 2021.



Figures originally produced by Floyd Snider and presented in Appendix G of the Engineering Design Report (CRETE 2021). These figures have been amended by CRETE to reflect sample locations that were removed during the remedial action, documented in the Removal Action Completion Report (RACR; CRETE 2022). See Figure A-7 of the RACR for results of the confirmation soil samples collected during the removal action from this CAA.

Legend

- Excavation Area Boundary(3)

Existing Confirmation Sample

- Base
- Sidewall
- Sidewall and Base

Proposed Confirmation Sample

- Base

Other Site Features

- Other Sample Location
- Ordinary High Water Mark

Highlighted Text

- Result Does Not Exceed CULs
- Result Greater Than CULs

Soil Cleanup Level
Arsenic: 7.3 mg/kg

Notes:
1. Statistical compliance with the CUL, which is based on natural background concentrations, will be demonstrated in accordance with WAC 173-340-740(7)(e), with adjustment to the allowable exceedance factor and the percentage of confirmation samples exceeding the CUL in accordance with Ecology statistical guidance for assessing compliance with natural background-based CULs (Ecology 1992).
2. Available records indicate the former ASKO warehouse, ASKO warehouse pad, and paved driveway were constructed prior to the start of Icicle Seafoods operations at the property and the vacant storage shed was constructed after Icicle Seafoods ceased operations.
3. The Cleanup Action Area 7 excavation will extend to the edges of the paved pads and structures that pre-date Icicle Seafoods operations. Other pavement will be removed during excavation. Confirmation samples will not be collected along the sidewalls of the excavation defined by the paved pads and structures that predated Icicle Seafoods operations.

· 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:
CAA = Cleanup Action Area
CUL = Cleanup level
ft bgs = Feet below ground surface
UCL=Upper Confidence Limit

0 15 30 60
Scale in Feet

N

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Time Oil Bulk Terminal Site
Seattle, Washington

Figure A-15
CAA-7 Excavation Area Sampling Plan

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5/17/2021

Table A-1 Statistical Analysis Confirmation Soil Sample Results - CAA-7
Time Oil Terminal, Seattle WA

Field Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Type	Analyte	Result (mg/kg)	Qualifier	CUL (mg/kg)	Is Result 2x CUL?	Does Result Exceed CUL?	Notes	Sample Count
CAA7-B01-1.0-1.25	11/13/2020	Base	1.25	Arsenic	3.65		7.3	No	No		1
CAA7-B02-1.0-1.25	11/13/2020	Base	1.25	Arsenic	5.7		7.3	No	No		2
CAA7-B03-1.0-1.25	11/13/2020	Base	1.25	Arsenic	6.73		7.3	No	No		3
CAA7-B04-2.0-2.25	11/13/2020	Base	2.25	Arsenic	6.01		7.3	No	No		4
CAA7-B05-1.0-1.5	2/22/2021	Base	1.5	Arsenic	9.24		7.3	No	Yes	Note 1	5
CAA7-B06-1.0-1.5	2/22/2021	Base	1.5	Arsenic	7.9		7.3	No	Yes	Note 1	6
CAA7-B07-1.0-1.5	2/22/2021	Base	1.5	Arsenic	5.83		7.3	No	No		7
CAA7-B08-1.0-1.5	2/22/2021	Base	1.5	Arsenic	4.85		7.3	No	No		8
CAA7-BASE-13	7/19/2021	Base	1	Arsenic	6.24		7.3	No	No		9
CAA7-BASE-14	7/19/2021	Base	1	Arsenic	6.71		7.3	No	No		10
CAA7-BASE-15	7/19/2021	Base	1	Arsenic	3.79		7.3	No	No		11
CAA7-BASE-16	7/19/2021	Base	1	Arsenic	3.06		7.3	No	No		12
CAA7-BASE-17	7/19/2021	Base	1	Arsenic	5.66		7.3	No	No		13
CAA7-BASE-18	7/19/2021	Base	2	Arsenic	6.85		7.3	No	No		14
CAA7-BASE-19	7/19/2021	Base	0.5	Arsenic	6.98		7.3	No	No		15
CAA7-SW11-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	3.63		7.3	No	No		16
CAA7-SW11-0.5-1.0	2/22/2021	Base	1	Arsenic	4.93		7.3	No	No		17
CAA7-SW12-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	3.99		7.3	No	No		18
CAA7-SW12-0.5-1.0	2/22/2021	Base	1	Arsenic	4.01		7.3	No	No		19
CAA7-SW13-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	2.24		7.3	No	No		20
CAA7-SW13-0.5-1.0	2/22/2021	Base	1	Arsenic	2.04		7.3	No	No		21
CAA7-SW14-0.5-1.0	2/22/2021	Base	1	Arsenic	6.02		7.3	No	No		22
CAA7-SW15-1.0-1.5	2/22/2021	Base	1.5	Arsenic	7.82		7.3	No	Yes	Note 1	23
CAA7-SW18-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	5.4		7.3	No	No		24
CAA7-SW20-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	5.01		7.3	No	No		25
CAA7-SW21-0.0-0.5	2/22/2021	Sidewall	0.5	Arsenic	4.42		7.3	No	No		26
CAA7-SW23-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	10.8		7.3	No	Yes	Note 1	27
CAA7-SW24-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	13.3		7.3	No	Yes	Note 1	28
CAA7-SW25-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	6.39		7.3	No	No		29
CAA7-SW26-0.0-0.5	3/22/2021	Sidewall	0.5	Arsenic	13.6		7.3	No	Yes	Note 1	30
COMP-1c-0.5-1.0	11/13/2020	Base	1	Arsenic	6.41		7.3	No	No		31
COMP-2a-0.5-1.0	11/13/2020	Base	1	Arsenic	3.54		7.3	No	No		32
COMP-2b-0.5-1.0	11/13/2020	Base	1	Arsenic	2.07		7.3	No	No		33
COMP-2c-0.5-1.0	11/13/2020	Base	1	Arsenic	4.16		7.3	No	No		34
COMP-2d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.38		7.3	No	No		35
COMP-3a-0.5-1.0	11/13/2020	Sidewall	1	Arsenic	4.59		7.3	No	No		36
COMP-3b-0.5-1.0	11/13/2020	Sidewall	1	Arsenic	3.43		7.3	No	No		37
COMP-3c-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.66		7.3	No	No		38
COMP-3d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	3.75		7.3	No	No		39
COMP-4c-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.74		7.3	No	No		40
COMP-4d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	3.99		7.3	No	No		41
COMP-5c-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	4.13		7.3	No	No		42
COMP-5d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	5.69		7.3	No	No		43
COMP-6a-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	5.77		7.3	No	No		44
COMP-6d-0.0-0.5	11/13/2020	Sidewall	0.5	Arsenic	1.07		7.3	No	No		45

Number of samples that exceed CUL?	6
Percent of samples that exceed CUL?	13%
Is this greater than 10%?	Yes
% allowed to exceed - see Note 1	18%
Is % samples that exceed CUL less than % allowable?	Yes

Notes:
CAA = Cleanup Action Area
CUL = Cleaup level
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
U = Analytes is not detected at the associated reporting limit.

Note 1. Statistical compliance with the cleanup level, which is based on natural background concentrations, is demonstrated in accordance with WAC 173-340-740(7)(d) and (e), with adjustment to the allowable exceedance factor and the percentage of confirmation samples exceeding the cleanup level in accordance with Ecology statistical guidance for assessing compliance with natural background-based cleanup levels (Ecology 1992). Details are provided in the EDR.
Below is a table of allowable exceedances per Ecology Statistical compliance:

Summary of Allowable Exceedances per Sample Quantity
Prepared for Statistical Compliance Evaluation for Arsenic in Soil at Area CAA-7
Time Oil Bulk Terminal Site, Seattle, WA

Total Samples	# Exceedances Allowed	% Exceedances Allowed	Probability Value[1]	Allowable Exceedance Factor[2]	Maximum Allowed Concentration[2]
10	2	20%	0.07	2.14	16
20	4	20%	0.043	2.45	18
30	5	17%	0.073	2.64	19
40	7	18%	0.042	2.79	20
45	8	18%	0.032	2.84	21
46	8	17%	0.036	2.86	21
47	8	17%	0.041	2.87	21
48	8	17%	0.046	2.88	21
49	8	16%	0.052	2.89	21
50	8	16%	0.058	2.9	21
51	8	16%	0.064	2.91	21
52	9	17%	0.032	2.92	21
53	9	17%	0.035	2.93	21
54	9	17%	0.04	2.94	21
55	9	16%	0.044	2.95	22
56	9	16%	0.049	2.96	22
57	9	16%	0.055	2.97	22
58	9	16%	0.06	2.97	22
59	9	15%	0.067	2.98	22
60	10	17%	0.034	2.99	22
61	10	16%	0.038	3	22

Notes
1. Associated probability value closest to 0.05-false positive error rate; derived based on 'Technical Attachment 1 To Figure 12' in 1992 Ecology Statistical Guidance (Publication No. 92-54, August 1992).
2. Allowable exceedance factor and maximum concentration derived based on arsenic background data for Puget Sound Basin (Ecology 1994) and 'Technical Attachment 2 To Figure 12' in 1992 Ecology Statistical Guidance (Publication 92-54, August 1992). Maximum concentration in mg/kg.

Table A-2 Statistical Analysis ProUCL Input Data - CAA-7
Time Oil Terminal, Seattle WA

Analyte	Result (mg/kg)
Arsenic	3.65
Arsenic	5.7
Arsenic	6.73
Arsenic	6.01
Arsenic	9.24
Arsenic	7.9
Arsenic	5.83
Arsenic	4.85
Arsenic	6.24
Arsenic	6.71
Arsenic	3.79
Arsenic	3.06
Arsenic	5.66
Arsenic	6.85
Arsenic	6.98
Arsenic	3.63
Arsenic	4.93
Arsenic	3.99
Arsenic	4.01
Arsenic	2.24
Arsenic	2.04
Arsenic	6.02
Arsenic	7.82
Arsenic	5.4
Arsenic	5.01
Arsenic	4.42
Arsenic	10.8
Arsenic	13.3
Arsenic	6.39
Arsenic	13.6
Arsenic	6.41
Arsenic	3.54
Arsenic	2.07
Arsenic	4.16
Arsenic	4.38
Arsenic	4.59
Arsenic	3.43
Arsenic	4.66
Arsenic	3.75
Arsenic	4.74
Arsenic	3.99
Arsenic	4.13
Arsenic	5.69
Arsenic	5.77
Arsenic	1.07

Table A-3 Statistical Analysis ProUCL Output Data - CAA-7
Time Oil Terminal, Seattle WA

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.2 7/26/2022 5:45:51 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	45	Number of Distinct Observations	44
Minimum	1.07	First Quartile	3.99
Second Largest	13.3	Median	4.93
Maximum	13.6	Third Quartile	6.39
Mean	5.448	SD	2.552
Coefficient of Variation	0.468	Skewness	1.448
Mean of logged Data	1.593	SD of logged Data	0.472

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.085	d2max (for USL)	2.915

Normal GOF Test

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.926	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.141	Lilliefors GOF Test	
1% Lilliefors Critical Value	0.153	Data appear Normal at 1% Significance Level	

Data appear Approximate Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	10.77	90% Percentile (z)	8.719
95% UPL (t)	9.783	95% Percentile (z)	9.646
95% USL	12.89	99% Percentile (z)	11.38

Gamma GOF Test

A-D Test Statistic	0.581	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.753	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.132	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.046	k star (bias corrected MLE)	4.725
Theta hat (MLE)	1.08	Theta star (bias corrected MLE)	1.153
nu hat (MLE)	454.2	nu star (bias corrected)	425.2
MLE Mean (bias corrected)	5.448	MLE Sd (bias corrected)	2.507

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	10.19	90% Percentile	8.805
95% Hawkins Wixley (HW) Approx. Gamma UPL	10.33	95% Percentile	10.12
95% WH Approx. Gamma UTL with 95% Coverage	11.69	99% Percentile	12.89
95% HW Approx. Gamma UTL with 95% Coverage	11.95		
95% WH USL	15.41	95% HW USL	16.09

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk Critical Value	0.953	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.111	Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.12	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	13.15	90% Percentile (z)	9.001
95% UPL (t)	10.96	95% Percentile (z)	10.68
95% USL	19.45	99% Percentile (z)	14.73

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	45	95% UTL with 95% Coverage	13.6
Approx, f used to compute achieved CC	2.368	Approximate Actual Confidence Coefficient achiev	0.901
		Approximate Sample Size needed to achieve spec	59
95% Percentile Bootstrap UTL with 95% Coverage	13.3	95% BCA Bootstrap UTL with 95% Coverage	13.3
95% UPL	12.55	90% Percentile	7.868
90% Chebyshev UPL	13.19	95% Percentile	10.49
95% Chebyshev UPL	16.69	99% Percentile	13.47
95% USL	13.6		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Gamma UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.2 7/26/2022 5:46:23 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	45	Number of Distinct Observations	44
		Number of Missing Observations	0
Minimum	1.07	Mean	5.448
Maximum	13.6	Median	4.93
SD	2.552	SD of logged Data	0.472

Table A-3 Statistical Analysis ProUCL Output Data - CAA-7
Time Oil Terminal, Seattle WA

Coefficient of Variation	0.468	Skewness	1.448

Gamma GOF Test

A-D Test Statistic	0.581	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.753	Data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.132	Data appear Gamma Distributed at 5% Significance Level	

Data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.046	k star (bias corrected MLE)	4.725
Theta hat (MLE)	1.08	Theta star (bias corrected MLE)	1.153
nu hat (MLE)	454.2	nu star (bias corrected)	425.2
MLE Mean (bias corrected)	5.448	MLE Sd (bias corrected)	2.507
		Approximate Chi Square Value (0.05)	378.4
Adjusted Level of Significance	0.0447	Adjusted Chi Square Value	377

Assuming Gamma Distribution

95% Approximate Gamma UCL	**6.122**	**95% Adjusted Gamma UCL**	**6.146**

Suggested UCL to Use

Data appear Approximate Normal, May want to try Normal Distribution

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Normal UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.2 7/26/2022 5:46:43 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%

C0

General Statistics

Total Number of Observations	45	Number of Distinct Observations	44
		Number of Missing Observations	0
Minimum	1.07	Mean	5.448
Maximum	13.6	Median	4.93
SD	2.552	SD of logged Data	0.472
Coefficient of Variation	0.468	Skewness	1.448

Normal GOF Test

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.926	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.141	Lilliefors GOF Test	
1% Lilliefors Critical Value	0.153	Data appear Normal at 1% Significance Level	

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6.088	95% Adjusted-CLT UCL (Chen-1995)	6.162
		95% Modified-t UCL (Johnson-1978)	6.101

Suggested UCL to Use

95% Student's-t UCL	6.088

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lognormal UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.2 7/26/2022 6:13:43 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	45	Number of Distinct Observations	44
		Number of Missing Observations	0
Minimum	1.07	Mean	5.448
Maximum	13.6	Median	4.93
SD	2.552	Std. Error of Mean	0.38
Coefficient of Variation	0.468	Skewness	1.448

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk Critical Value	0.953	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.111	Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.12	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Logged Statistics

Minimum of Logged Data	0.0677	Mean of logged Data	1.593
Maximum of Logged Data	2.61	SD of logged Data	0.472

Lognormal Maximum likelihood Estimates (MLEs)

MLE Mean	5.497	MLE Standard Deviation	2.743
MLE Median	4.918	MLE Skewness	1.622
MLE Coefficient of Variation	0.499	80% MLE Quantile	7.315
90% MLE Quantile	9.001	95% MLE Quantile	10.68
99% MLE Quantile	14.73		

Lognormal Minimum Variance Unbiased Estimates (MVUEs)

MVUE Mean	5.482	MVUE SD	2.708
MVUE Median	4.906	MVUE SEM	0.402

Table A-3 Statistical Analysis ProUCL Output Data - CAA-7
Time Oil Terminal, Seattle WA

Assuming Lognormal Distribution			
95% H-UCL	6.285	90% Chebyshev (MVUE) UCL	6.689
95% Chebyshev (MVUE) UCL	7.236	97.5% Chebyshev (MVUE) UCL	7.995
99% Chebyshev (MVUE) UCL	9.486		
Nonparametric Distribution Free UCLs			
95% CLT UCL	6.074	95% BCA Bootstrap UCL	6.102
95% Standard Bootstrap UCL	6.048	95% Bootstrap-t UCL	6.221
95% Hall's Bootstrap UCL	6.256	95% Percentile Bootstrap UCL	6.05
90% Chebyshev(Mean, Sd) UCL	6.59	95% Chebyshev(Mean, Sd) UCL	7.106
97.5% Chebyshev(Mean, Sd) UCL	7.824	99% Chebyshev(Mean, Sd) UCL	9.233

Suggested UCL to Use
Data appear Normal, May want to try Normal Distribution

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 7/26/2022 6:11:53 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	0.95

C0

Raw Statistics	
Number of Valid Observations	45
Number of Distinct Observations	44
Minimum	1.07
Maximum	13.6
Mean of Raw Data	5.448
Standard Deviation of Raw Data	2.552
Khat	5.046
Theta hat	1.08
Kstar	4.725
Theta star	1.153
Mean of Log Transformed Data	1.593
Standard Deviation of Log Transformed Data	0.472

Normal GOF Test Results

Correlation Coefficient R	0.937
Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical (0.05) Value	0.945
Approximate Shapiro Wilk P Value	1.57E-04
Lilliefors Test Statistic	0.141
Lilliefors Critical (0.05) Value	0.131

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.974
A-D Test Statistic	0.581
A-D Critical (0.05) Value	0.753
K-S Test Statistic	0.1
K-S Critical(0.05) Value	0.132

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.972
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.05) Value	0.945
Approximate Shapiro Wilk P Value	0.162
Lilliefors Test Statistic	0.111
Lilliefors Critical (0.05) Value	0.131

Data appear Lognormal at (0.05) Significance Level

Source:
USEPA. ProUCL: Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations.
Version 5.2. https://www.epa.gov/land-research/proucl-software, 2022

Appendix A-2
As-Built Drawings

LEGEND

- DESIGN EXCAVATION LIMITS
- AS-BUILT EXCAVATION LIMITS (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- IN-SITU GROUNDWATER INJECTION POINT
- OHW — ORDINARY HIGH WATER
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

CAA-6b, SEE DETAILED PLAN ON DWG C-5
CAA-7, SEE DETAILED PLAN ON DWG C-6
CAA-6a, SEE DETAILED PLAN ON DWG C-5
CAA-2b, SEE DETAILED PLAN ON DWG C-3
CAA-2a, SEE DETAILED PLAN ON DWG C-7
CAA-5, SEE DETAILED PLAN ON DWG C-4
CAA-4a, SEE DETAILED PLAN ON DWG C-8
CAA-4b, SEE DETAILED PLAN ON DWG C-8
CAA-3, SEE DETAILED PLAN ON DWG C-4
CAA-1b, SEE DETAILED PLAN ON DWG C-2
CAA-1a, SEE DETAILED PLAN ON DWG C-2
HAUL TRUCK DIESEL SPILL, SEE DETAILED PLAN ON DWG C-4

PASSIVE GW TREATMENT AREA
INTERCEPTOR TRENCH
TRENCH BOX AND SHORING

W COMMODORE WAY
BNSF RAILWAY
27TH AVE W

02MW22 02MW20 02MW21 02MW17 02MW07 02MW19 02MW18 02MW03 02MW01 02MW06 02MW04 02MW16 02MW09 02MW15 02MW14 02MW13 02MW05 02MW10 02MW08
01MW83 01MW106 01MW107 01MW84 01MW31 01MW104 01MW102 01MW32 01MW101 01MW88 01MW35 01MW36
01MW53 01MW52 01MW89 01MW50 01MW47 01MW51 01MW09 01MW48 01MW49 01MW87 01MW34
01MW85 MW02 MW06 01MW30 01MW03 01MW02 01MW86 01MW16 01MW10 01MW103
01MW80 01MW108 01MW56 01MW07 01MW19 01MW08 01MW18 01MW05 01MW04 01MW33
MW05 01MW57 01MW82 01MW81 01MW76 01MW45 01MW20 01MW68 01MW11
MW01 MW04 MW03 01MW46 01MW59 01MW29 01MW43
01MW28 01MW24 01MW42
01MW58 01MW44 01MW54 01IW10 01IW09 01SVE01 01MW55 01MW65 01MW77 01MW06 01MW69 01MW27 01MW67
01MW79 01MW63 01MW15 01MW01 01MW12 01MW105
01MW66 01MW74
01MW64 01MW70 01MW71 01MW78 01MW62 01MW98 01MW94 01MW92 01MW60 01MW97 01MW93 01MW96 01MW95 01MW61
01MW73 01MW75 01MW40 01MW72 01MW91 01MW37 01MW13 01MW38 01MW90 01MW39
01MW17 01MW99 01MW100

0 40 80
SCALE IN FEET

File: C:\Users\cgreene\Downloads\CAD Files\Time Oil Bulk Terminal-Asbuilt\C1.dwg Plot Date: August 5, 2022 Plotted by: Greene, Chris

Rev	Date	Description	By

Client

CRETE CONSULTING, INC.
108 S. Washington Street, Suite 300
Seattle, Washington 98104
(206) 491-7554
www.creteconsulting.com

Scale As Noted

SCALE WARNING
Drawing is not to scale, if scale bar doesn't measure one inch

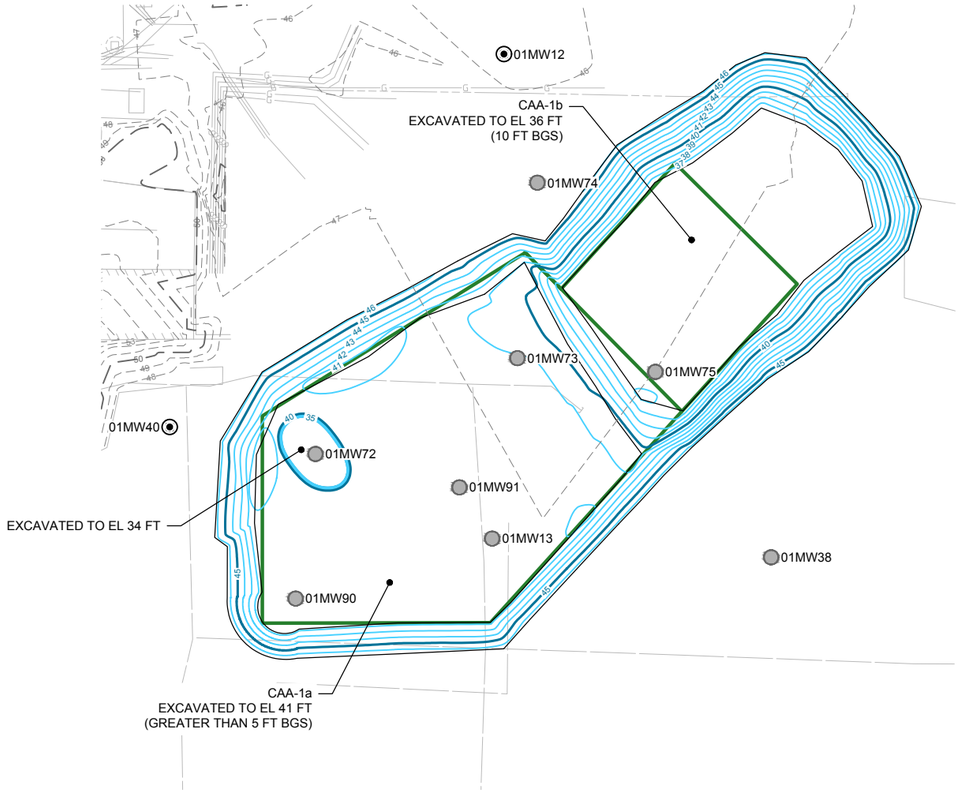
Designer	M. Byers
Drafter	C. Taylor
Checker	X
Reviewer	X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

Remediation Areas AS-BUILTS

Drawing No.
C-1

Sheet 15 of 26



DETAILED PLAN VIEW

CAA-1 EXCAVATION AREAS

0 20 40

SCALE IN FEET

LEGEND

- DESIGN EXCAVATION LIMITS
- AS-BUILT EXCAVATION LIMITS (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED

NOTES

1. EXCAVATED AREAS WERE BE BACKFILLED AND COMPACTED WITH CLEAN IMPORT MATERIAL TO EXISTING GRADE +/- 1 FOOT. FINAL SURFACES WERE STABILIZED WITH COMPACTED GRAVEL SURFACING TO PREVENT EROSION.
2. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT & INSTALLATION OF THE FINAL CAP.

CAA AREA	SUBSURFACE BACKFILL (GREATER THAN 2 FT BGS)	SURFACE MATERIAL (2 FT BGS)
CAA-1	QUARRY SPALLS AND GRAVEL BORROW	BALLAST ROCK TO MATCH SURROUNDING GRADE

Rev	Date	Description	By

Client

CRETE CONSULTING, INC.
108 S. Washington Street, Suite 300
Seattle, Washington 98104
(206) 491-7554
www.creteconsulting.com

Scale As Noted

SCALE WARNING
Drawing is not to scale, if scale bar doesn't measure one inch

Designer	M. Byers
Drafter	C. Taylor
Checker	X
Reviewer	X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

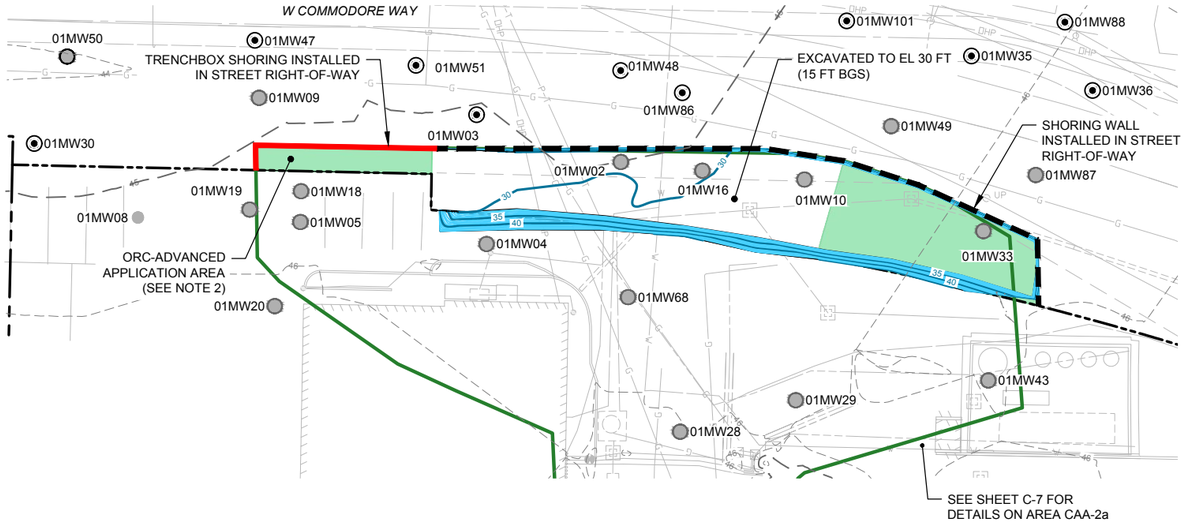
CAA-1 Excavation Area AS-BUILTS

Drawing No.

C-2

Sheet 16 of 26

File: C:\Users\cgreene\Downloads\CAD Files\Time Oil Bulk Terminal-AsbuiltC2 through C11.dwg Plot Date: June 20, 2022 Plotted by: Greene, Chris



DETAILED PLAN VIEW

CAA-2B EXCAVATION AREA

0 20 40

SCALE IN FEET

LEGEND

- DESIGN EXCAVATION LIMITS
- AS-BUILT EXCAVATION LIMITS (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- SHORING WALL (SEE SHORING DRAWINGS SS1.0 THRU SS4.0 FROM THE EDR FOR DETAILS)
- TRENCH BOX SHORING
- ORC ADVANCED PELLETS (REGENESIS®) ADDED DURING BACKFILLING ACTIVITIES
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

1. EXCAVATED AREAS WERE BACKFILLED AND COMPACTED WITH CLEAN IMPORT MATERIAL TO EXISTING GRADE +/- 1 FOOT. FINAL SURFACES IN THE CITY OF SEATTLE ROW WERE RETURNED TO PRE-EXISTING CONDITIONS BASED ON CITY OF SEATTLE REQUIREMENTS.
2. ORC ADVANCED PELLETS (DRY AMENDMENTS) WERE ADDED DURING BACKFILLING ACTIVITIES IN THE NORTHEAST AND THE NORTHWEST CORNERS. ORC ADVANCED PELLETS WERE SPREAD BY HAND EVENLY ACROSS THE APPLICATION AREA BOTH HORIZONTALLY AND VERTICALLY WITHIN THE SATURATED ZONE DURING BACKFILLING. LAGGING WAS REMOVED FROM THE NORTHEAST PORTION OF THE EXCAVATION DURING BACKFILLING. TRENCH BOXES WERE USED FOR SHORING ALONG THE NORTHWEST PORTION OF THE EXCAVATION; TRENCH BOXES WERE COMPLETELY REMOVED AFTER EXCAVATION ACTIVITIES WERE COMPLETED.
3. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT & INSTALLATION OF THE FINAL CAP.

CAA AREA	SUBSURFACE BACKFILL (GREATER THAN 2 FT BGS)	SURFACE MATERIAL (2 FT BGS)
CAA-2b	QUARRY SPALLS AND GRAVEL BORROW	PAVED ASPHALT SURFACE WHICH INCLUDES: 1" HOT MIX ASPHALT (HMA) CLASS 1 AND 2" OF HMA CLASS 1/2

Rev	Date	Description	By

Client

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Seattle, Washington 98104
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www.creteconsulting.com

Scale As Noted

SCALE WARNING
Drawing is not to scale, if scale bar doesn't measure one inch

Designer M. Byers
Drafter C. Taylor
Checker X
Reviewer X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

CAA-2b Excavation Area AS-BUILTS

Drawing No. **C-3**

Sheet 17 of 26

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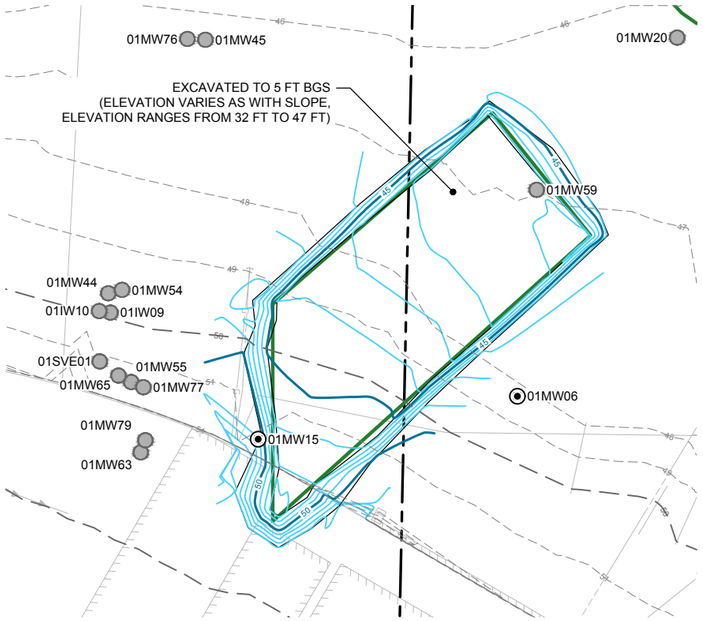
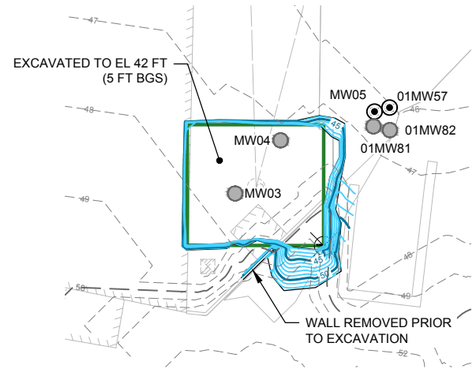


DETAILED PLAN VIEW

CAA-3 EXCAVATION AREA

0 20 40

SCALE IN FEET

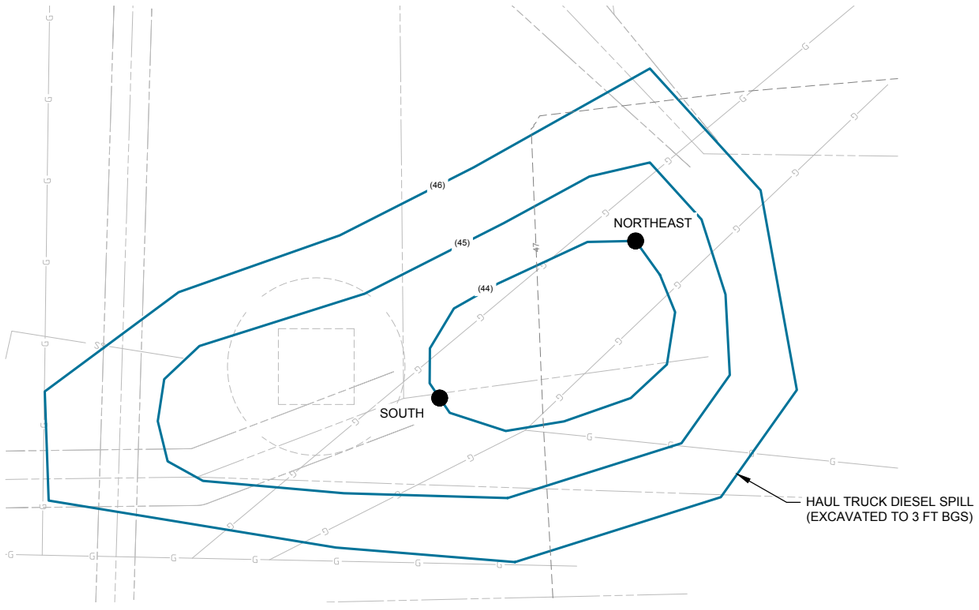


DETAILED PLAN VIEW

CAA-5 EXCAVATION AREA

0 20 40

SCALE IN FEET



DETAILED PLAN VIEW

DIESEL SPILL

0 2 4

SCALE IN FEET

LEGEND

- DESIGN EXCAVATION LIMITS
- AS-BUILT EXCAVATION LIMITS (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- DIESEL SPILL CLEANUP AREA CONFIRMATION SAMPLE LOCATION
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

1. EXCAVATED AREAS WERE BACKFILLED AND COMPACTED WITH CLEAN IMPORT MATERIAL TO EXISTING GRADE +/- 1 FOOT. FINAL SURFACES WERE STABILIZED WITH COMPACTED GRAVEL SURFACING TO PREVENT EROSION.
2. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT & INSTALLATION OF THE FINAL CAP.

CAA AREA	SUBSURFACE BACKFILL (GREATER THAN 2 FT BGS)	SURFACE MATERIAL (2 FT BGS)
CAA-3	QUARRY SPALLS AND GRAVEL BORROW	BALLAST ROCK TO MATCH SURROUNDING GRADE
CAA-5	BALLAST ROCK	BALLAST ROCK TO MATCH SURROUNDING GRADE
DIESEL SPILL AREA	BALLAST ROCK	BALLAST ROCK TO MATCH SURROUNDING GRADE

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Drafter	C. Taylor
Checker	X
Reviewer	X

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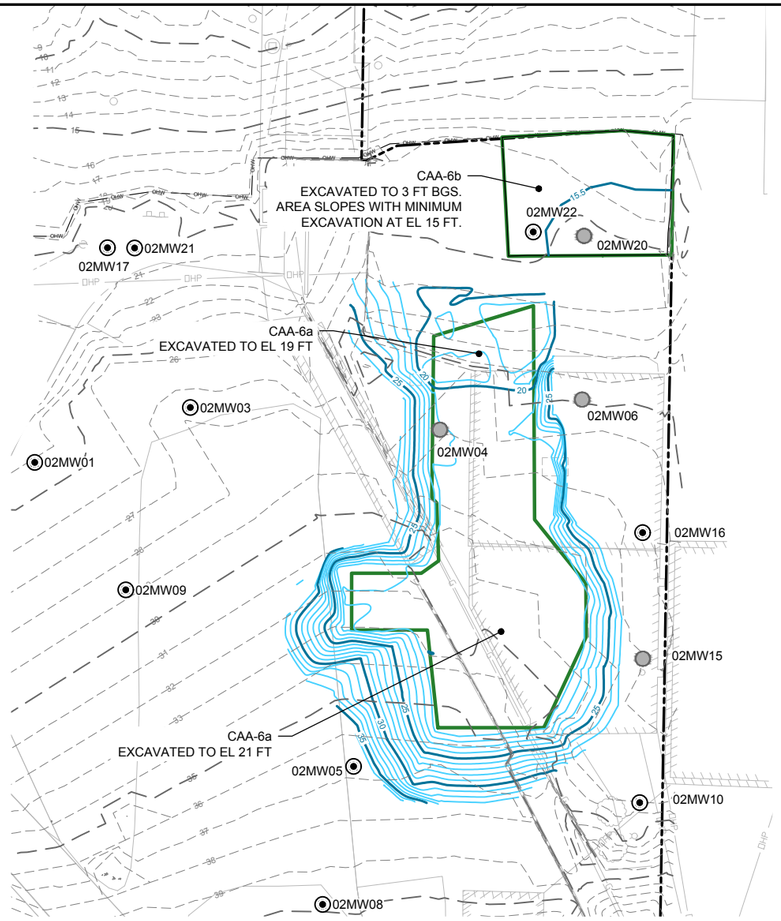
Remediation Design
Seattle, Washington

CAA-3, CAA-5 & Diesel Spill Excavation Areas AS-BUILTS

Drawing No.

C-4

File: C:\Users\cgreene\Downloads\CAD Files\Time Oil Bulk Terminal-AsbuiltC2 through C11.dwg Plot Date: June 20, 2022 Plotted by: Greene, Chris



DETAILED PLAN VIEW

CAA-6 EXCAVATION AREAS

0 20 40

SCALE IN FEET

N

LEGEND

- DESIGN EXCAVATION LIMITS
- AS-BUILT EXCAVATION LIMITS (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- ORDINARY HIGH WATER
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

1. EXCAVATED AREAS WERE BACKFILLED AND COMPACTED WITH CLEAN IMPORT MATERIAL TO TIE INTO EXISTING PERIMETER GRADES. FINAL SURFACES WERE STABILIZED WITH COMPACTED GRAVEL SURFACING TO PREVENT EROSION.
2. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT.

CAA AREA	SUBSURFACE BACKFILL (GREATER THAN 2 FT BGS)	SURFACE MATERIAL (2 FT BGS)
CAA-6a	QUARRY SPALLS AND GRAVEL BORROW	BALLAST ROCK TO MATCH SURROUNDING GRADE
CAA-6b	GRAVEL BORROW	BALLAST ROCK AND RIPRAP, AREA WAS GRADED TO MATCH SURROUNDING GRADE

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Designer	M. Byers
Drafter	C. Taylor
Checker	X
Reviewer	X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

CAA-6 Excavation Areas AS-BUILTS

Drawing No.
C-5

Sheet 19 of 26

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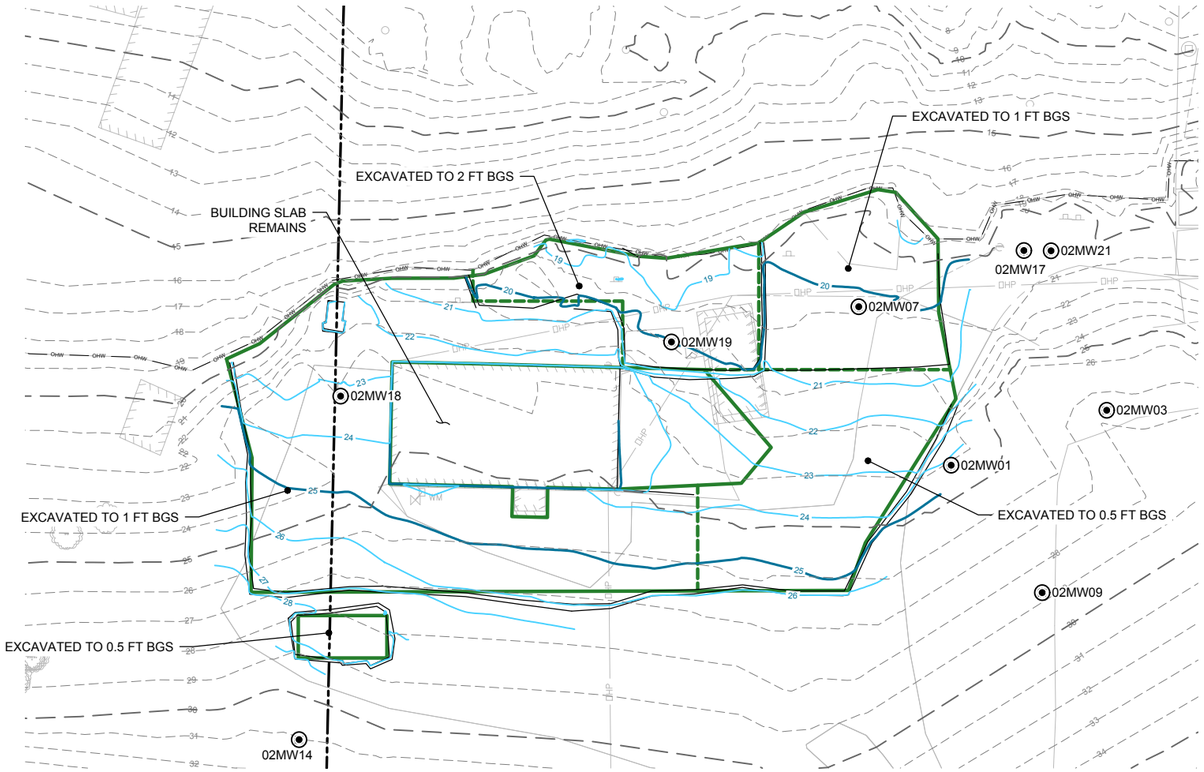

DETAILED PLAN VIEW

CAA-7 EXCAVATION AREAS

0 20 40

SCALE IN FEET

LEGEND

- DESIGN EXCAVATION LIMITS
- AS-BUILT EXCAVATION LIMITS (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- ORDINARY HIGH WATER
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

1. EXCAVATED AREAS WERE BACKFILLED AND COMPACTED WITH CLEAN IMPORT MATERIAL TO EXISTING GRADE +/- 1 FOOT. FINAL SURFACES WERE STABILIZED WITH COMPACTED GRAVEL SURFACING TO PREVENT EROSION.
2. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT.

CAA AREA	SUBSURFACE BACKFILL (GREATER THAN 2 FT BGS)	SURFACE MATERIAL (2 FT BGS)
CAA-7	NO SUBSURFACE BACKFILL, EXCAVATION WAS ONLY 2 FEET BELOW GROUND SURFACE	BALLAST ROCK TO MATCH SURROUNDING GRADE

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Drafter	C. Taylor
Checker	X
Reviewer	X

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Remediation Design
Seattle, Washington

CAA-7 Excavation Areas AS-BUILTS

Drawing No.

C-6

Sheet 20 of 26

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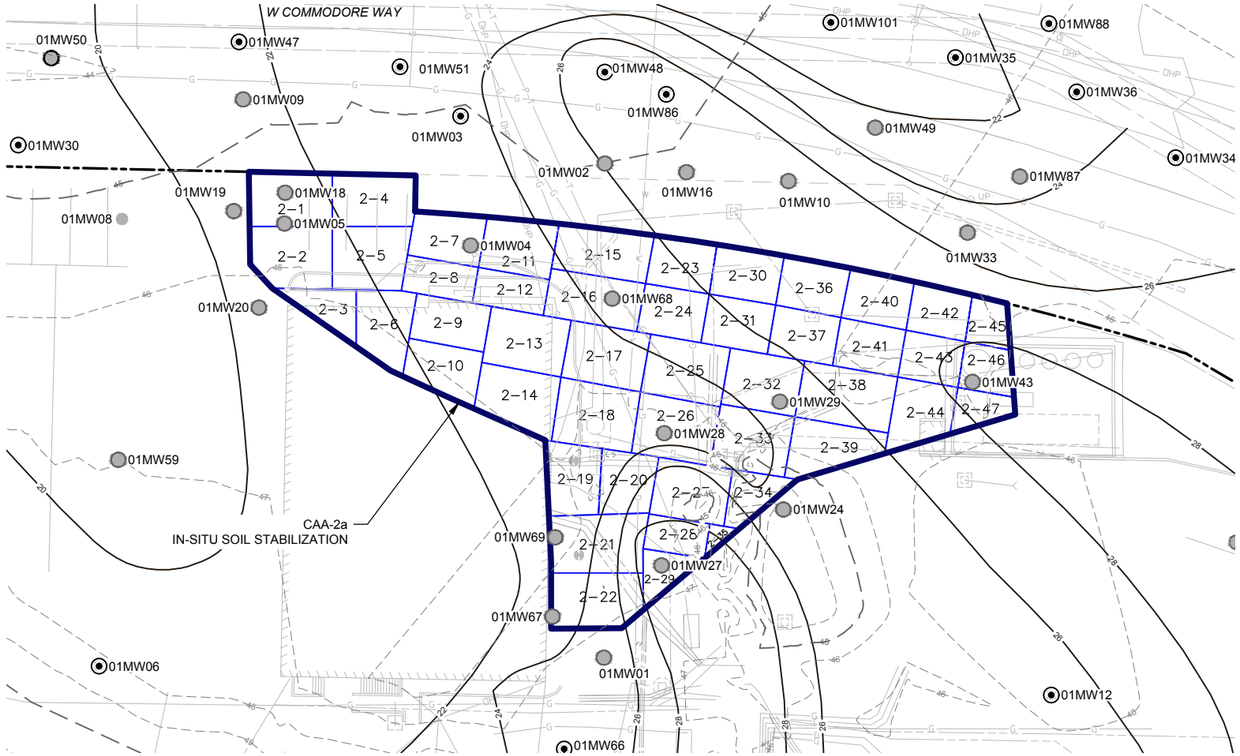

DETAILED PLAN VIEW

CAA-2A IN-SITU SOLIDIFICATION AREA

0 20 40

SCALE IN FEET

LEGEND

- IN-SITU STABILIZATION / SOLIDIFICATION
- 2–28 EXCAVATION MIXING GRID CELL WITH CELL IDENTIFICATION (SEE TABLE)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- 20 TOP OF SILT ELEVATION CONTOUR (FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

1. THE FINAL COMPLIANCE GRID NETWORK WAS ADJUSTED FROM THE EDR DRAWINGS TO REPRESENT SMALLER GRID CELLS THAT COULD BE WORKED EASILY WITHIN ONE SHIFT. THE TOTAL MIXING DEPTHS WERE ALSO ADJUSTED BASED ON THE SMALLER GRID CELL SIZE. THE MIXING DEPTH IS BASED ON THE TOP OF THE SILT AND WAS VERIFIED IN THE FIELD DURING MIXING.
2. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT & INSTALLATION OF THE FINAL CAP.

CELL ID	Mixed Elevation	Original Target Elevation (ft NAVD88)	Revised Target Elevation (ft NAVD88)
2_1	20.4	20	no change
2_2	20.2	20	no change
2_3	20.2	20	no change
2_4	20.2	20	no change
2_5	20.1	20	no change
2_6	20.2	20	no change
2_7	22.0	22	no change
2_8	22.0	22	no change
2_9	21.1	21	22
2_10	21.0	21	no change
2_11	22.0	22	no change
2_12	22.0	22	no change
2_13	22.0	22	23
2_14	22.2	22	no change
2_15	23.0	23	no change
2_16	23.5	23	no change
2_17	22.1	22	23
2_18	22.0	22	no change
2_19	22.1	22	no change
2_20 E	25.0	22	25
2_20 W	24.1	22	24
2_21 C	24.0	22	24
2_21 E	26.0	22	26
2_21 W	22.0	22	no change
2_22 C	25.2	22	25
2_22 E	25.5	22	25
2_22 E	22.3	22	25
2_22 W	22.2	22	no change
2_23	23.9	24	no change
2_24	24.0	24	no change
2_25	22.3	22	24
2_26	23.0	22	23
2_27	25.1	23	25
2_28	26.9	23	27
2_29	26.8	22	27
2_30	24.2	24	no change
2_31	23.9	24	no change
2_33	23.2	23	24
2_34 N	23.1	23	no change
2_34 S	24.7	23	25
2_35	26.0	23	26
2_36	25.4	25	no change
2_37	25.0	25	no change
2_38	24.1	24	25
2_39	24.0	24	24
2_40	25.0	25	no change
2_41	25.1	25	no change
2_42	26.0	26	no change
2_43	26.2	26	no change
2_44	25.0	25	no change
2_45	25.9	26	no change
2_46	26.0	26	no change
2_47	25.0	25	26

NOTES

1. CELLS 2-20 THROUGH 2-22 AND 2-34 WERE SPLIT INTO SMALLER UNITS IDENTIFIED AS 'EAST', 'WEST', AND 'CENTER'.
2. TARGET ELEVATIONS WERE ADJUSTED WHEN THE MIXING CELL LAYOUT WAS REVISED BY THE CONTRACTOR. ELEVATIONS WERE REVISED BASED ON THE TOP OF SILT CONTOUR IN THE REVISED SMALLER CELL. ORIGINAL TARGET ELEVATIONS ARE FROM THE EDR.
3. CONSTRUCTION SPECIFICATIONS ALLOWED FOR MIXING DEPTH TOLERANCE OF ±0.5 FT RELATIVE TO TARGET ELEVATION.

Rev	Date	Description	By

Client

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Scale As Noted

SCALE WARNING
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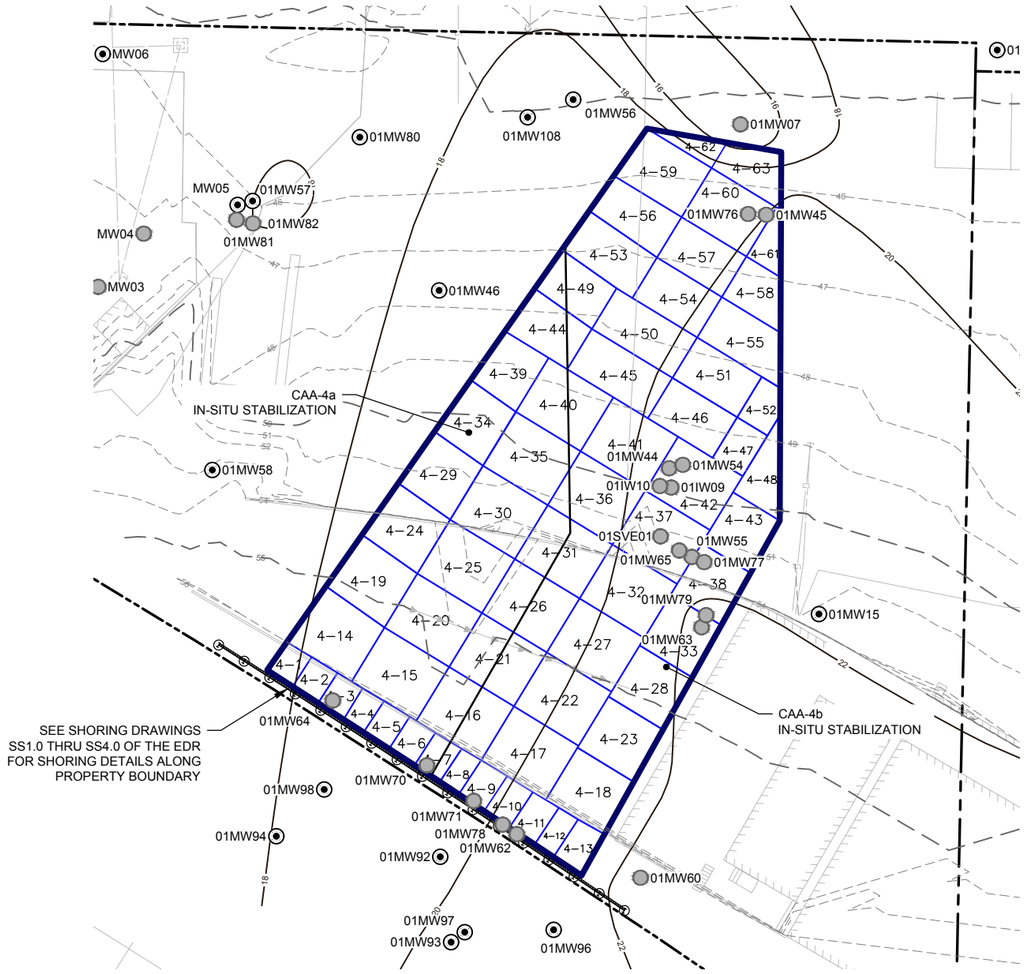
Designer M. Byers
Drafter C. Taylor
Checker X
Reviewer X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

CAA-2a Insitu Solidification Area AS-BUILTS

Drawing No.
C-7

Sheet 21 of 26



DETAILED PLAN VIEW

CAA-4A IN-SITU SOLIDIFICATION AREA

0 20 40

SCALE IN FEET

LEGEND

- IN-SITU STABILIZATION / SOLIDIFICATION
- 2–28 EXCAVATION MIXING GRID CELL WITH CELL IDENTIFICATION (SEE TABLE)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- 20 TOP OF SILT ELEVATION CONTOUR (FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

1. THE FINAL COMPLIANCE GRID NETWORK WAS ADJUSTED FROM THE EDR DRAWINGS TO REPRESENT SMALLER GRID CELLS THAT COULD BE WORKED EASILY WITHIN ONE SHIFT. THE TOTAL MIXING DEPTHS WERE ALSO ADJUSTED BASED ON THE SMALLER GRID CELL SIZE. THE MIXING DEPTH IS BASED ON THE TOP OF THE SILT AND WAS VERIFIED IN THE FIELD DURING MIXING.
2. FINAL SURFACE ELEVATION & CONSTRUCTED PROFILES WILL BE PROVIDED FOLLOWING COMPLETION OF PROPERTY REDEVELOPMENT & INSTALLATION OF THE FINAL CAP.

CELL ID	Mixed Elevation	Target Elevation (ft NAVD88)
4_1	17.4	17
4_2	17.4	17
4_3	17.3	17
4_4	17.3	17
4_5	18.3	18
4_6	18.3	18
4_7	18.4	18
4_8	18.3	18
4_9	19.3	19
4_10	19.3	19
4_11	19.3	19
4_12	19.1	19
4_13	20.4	20
4_14	17.4	17
4_15	18.4	18
4_16	19.3	19
4_17	20.3	20
4_18	20.2	20
4_19	17.4	17
4_20	18.4	18
4_21	19.3	19
4_22	20.2	20
4_23	20.2	20
4_24	17.3	17
4_25	18.2	18
4_26	19.3	19
4_27	20.3	20
4_28	20.4	20
4_29	17.3	17
4_30	19.2	19
4_31	20.3	20
4_32	21.0	21
4_33	19.9	20
4_34	17.4	17
4_35	19.3	19
4_36	20.4	20
4_37	21.4	21
4_38	20.2	20
4_39	17.3	17
4_40	19.3	19
4_41	20.2	20
4_42	21.2	21
4_43	20.2	20
4_44	18.3	18
4_45	19.8	20
4_46	20.0	20
4_47	20.1	20
4_48	20.1	20
4_49	18.3	18
4_50	20.1	20
4_51	20.1	20
4_52	19.9	20
4_53	18.3	18
4_54	19.7	20
4_55	19.3	19
4_56	18.1	18
4_57	20.0	20
4_58	19.0	19
4_59	17.3	17
4_60	17.1	17
4_61	17.3	17
4_62	17.5	17
4_63	17.4	17

NOTES

1. CONSTRUCTION SPECIFICATIONS ALLOWED FOR MIXING DEPTH TOLERANCE OF ±0.5 FT RELATIVE TO TARGET ELEVATION.

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Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

CAA-4a Insitu Solidification Area AS-BUILTS

Scale As Noted

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Designer	M. Byers
Drafter	C. Taylor
Checker	X
Reviewer	X

Drawing No. C-8

Sheet 22 of 26

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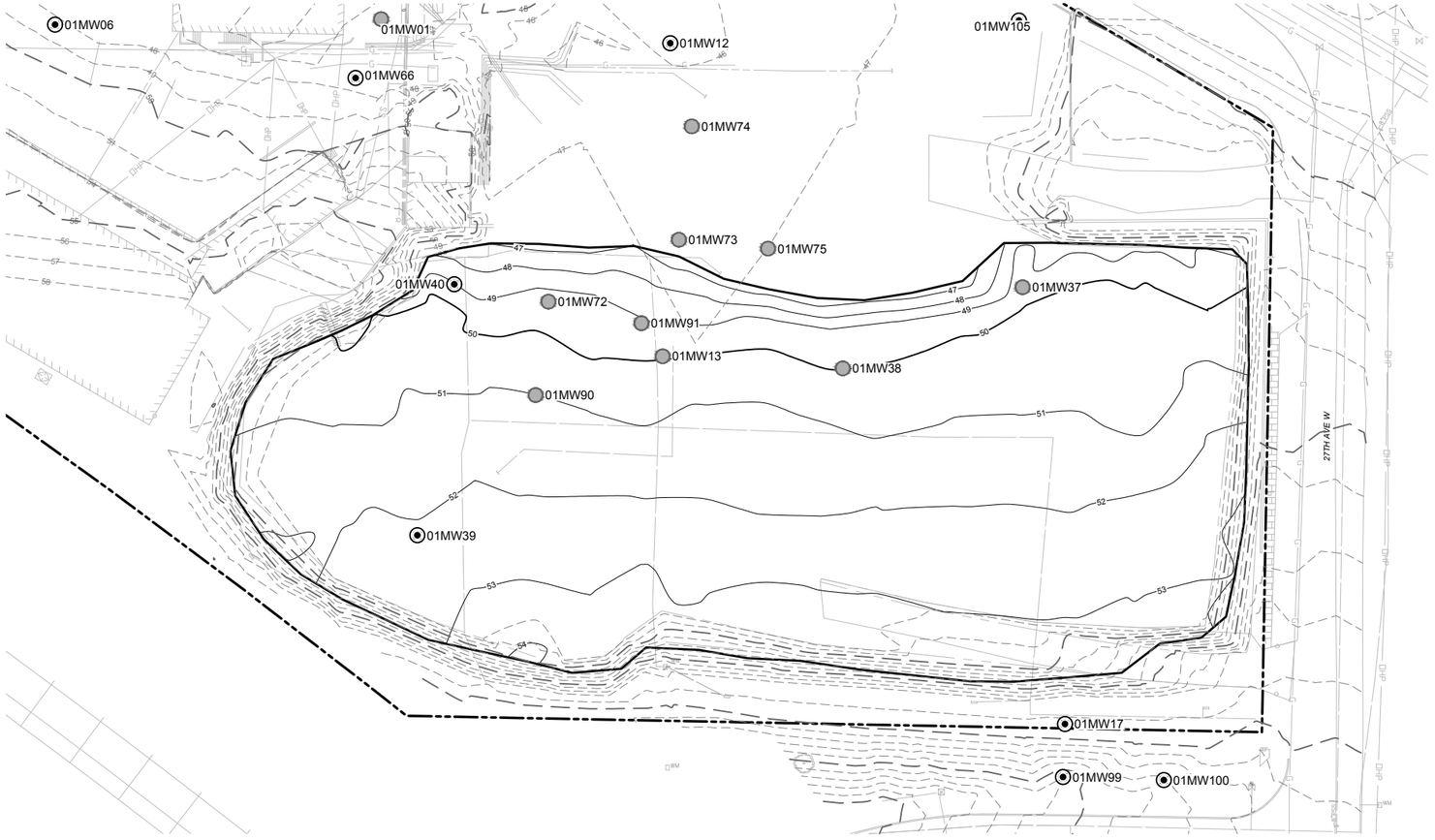

DETAILED PLAN VIEW

ISS SWELL MANAGEMENT AREA

0 30 60

SCALE IN FEET

LEGEND

- ISS SWELL MATERIAL FILL AS-BUILT FINISH GRADE CONTOUR (ELEVATIONS FT NAVD88)
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- MONITORING WELL PROTECTED DURING CONSTRUCTION ACTIVITIES
- MONITORING WELL DECOMMISSIONED
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES

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Drafter	C. Taylor
Checker	X
Reviewer	X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

ISS Swell Management Area AS-BUILTS

Drawing No.
C-9

Sheet 23 of 26

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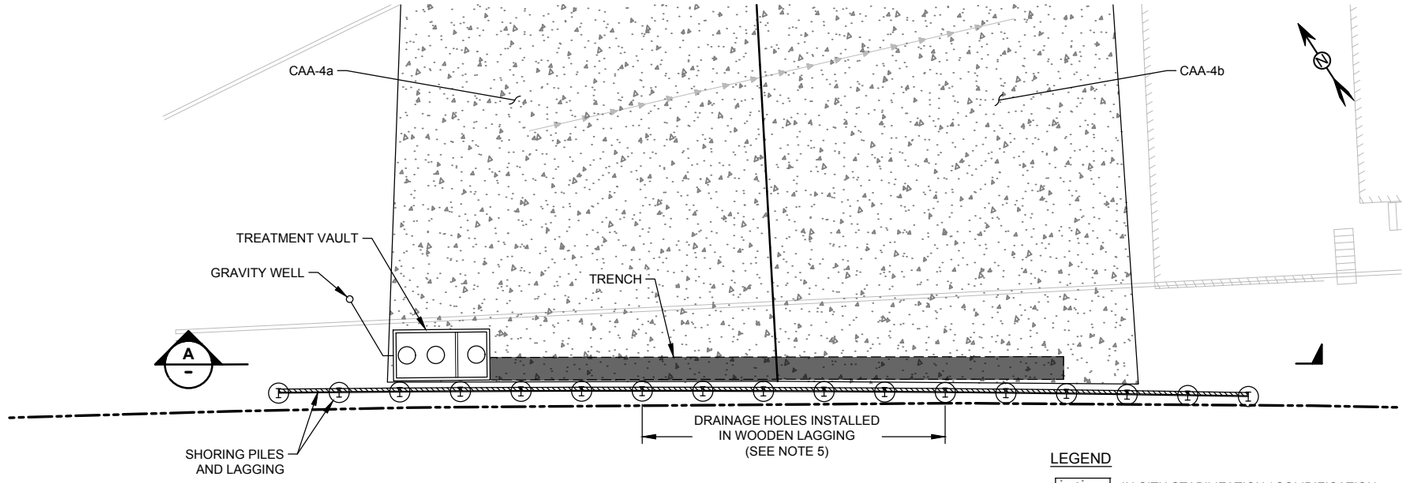


DETAILED PLAN VIEW

INFILTRATION TRENCH

0 20 40

SCALE IN FEET

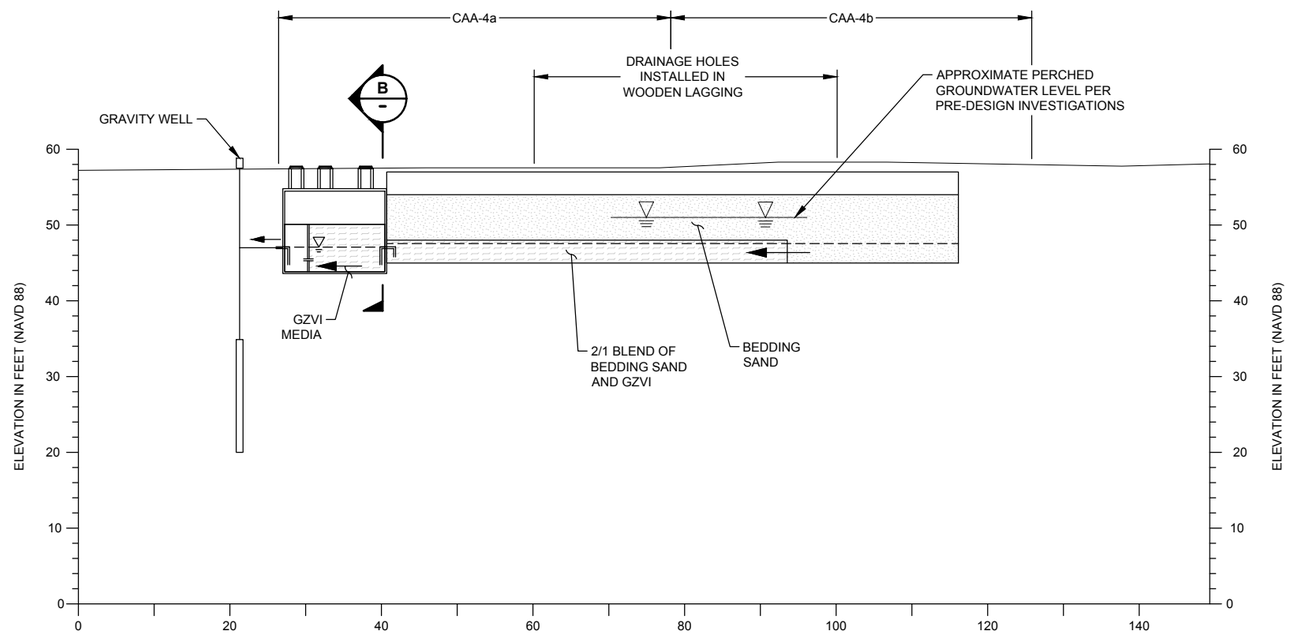
LEGEND

IN-SITU STABILIZATION / SOLIDIFICATION

PARCEL BOUNDARY FOR
TOC SEATTLE TERMINAL 1, LLC PROPERTIES

NOTES

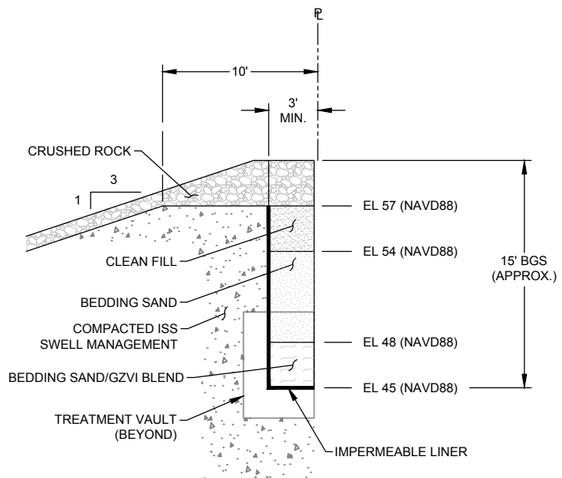
1. SHORING WAS INSTALLED ALONG THIS PROPERTY BOUNDARY TO COMPLETE THE ISS WORK PRIOR TO THE INSTALLATION OF THE TRENCH AND TREATMENT VAULT. DURING TRENCH INSTALLATION OF THE TREATMENT VAULT WATER DRAINAGE HOLES WERE DRILLED INTO PORTIONS OF THE WOODEN LAGGING BETWEEN THE SOLIDER PILES FROM ELEVATION 45 TO 54 FEET NAVD8 TO ENCOURAGE GROUNDWATER FLOW INTO THE TREATMENT VAULT. THE REMAINING LAGGING HAS GAPS BETWEEN ALL BOARDS THAT ALLOW GROUNDWATER FLOW.
2. TREATMENT VAULT CONSISTED OF AN OLDCASTLE PRECAST MODEL 6X12-GA 1,500 GALLON VAULT WITH ACCESS MANHOLES. THE SEPARATOR PORTION OF THE VAULT WAS FILLED WITH 1,025 GALLONS OF GZVI. THE GZVI WAS AN 8 TO 50 MESH PRODUCT THAT WAS CERTIFIED CLEAN BY THE MANUFACTURER.
3. GRAVITY WELL INSTALLATION INCLUDED THE FOLLOWING:
   A. GRAVITY WELL IS A 6-INCH DIAMETER PVC WELL, SCREENED FROM ELEVATION 20 TO 35 FEET NAVD88.
   B. PVC WELL MATERIALS ARE 0.030-INCH SLOT AND 2/12 COLORADO SILICA SAND.
   C. BENTONITE SEAL WAS PLACED TO ELEVATION 46 FEET NAVD88, CORRESPONDING TO THE INVERT OF THE TEE CONNECTION CONSTRUCTED FROM THE WELL TO VAULT. PIPE FROM THE VAULT TO GRAVITY WELL IS A 2-INCH PVC PIPE SLOPED AT 1 TO 2%.
4. GEOMEMBRANE LINER WAS USED AS A SEPARATION LAYER BETWEEN THE ISS AND TRENCH BACKFILL MATERIALS. TRENCH CONSTRUCTION WAS COMPLETED PER THE SPECIFICATIONS.
5. LARGE DIAMETER HOLES (4-INCHES) WERE DRILLED IN THE LAGGING FROM THE SHORING WALL FROM AN APPROXIMATELY 50 FOOT WIDE AREA TO FACILITATE PERCHED WBZ GROUNDWATER FLOW INTO THE TRENCH. HOLES WERE PLACED ON 4-FOOT SPACINGS TO ALLOW ADDITIONAL WATER MOVEMENT THROUGH THE LAGGING.



TRENCH PROFILE

0 10 20

SCALE IN FEET
HORIZONTAL = VERTICAL



TRENCH SECTION

0 5 10

SCALE IN FEET

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Designer	M. Byers
Drafter	C. Taylor
Checker	X
Reviewer	X

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

Interceptor Trench AS-BUILTS

Drawing No.
C-10

Sheet 24 of 26

LEGEND

- EXCAVATION / TREATMENT AREA
- BUILDING FOUNDATIONS
- ASPHALT PAVING
- CONCRETE PAVING
- GRAVEL SURFACES
- PRECONSTRUCTION SURFACE (ELEVATIONS FT NAVD88)
- PARCEL BOUNDARY FOR TOC SEATTLE TERMINAL 1, LLC PROPERTIES
- SITE PERIMETER FENCING

STABILIZED INTERIM SURFACES

- ISS AREAS - WOVEN INDICATOR GEOTEXTILE FABRIC WITH 6 INCHES CRUSHED ROCK
- ISS SWELL AREA - WOVEN INDICATOR GEOTEXTILE FABRIC
- EXCAVATION AREAS - 6 INCHES OF CRUSHED ROCK TO THE SURROUNDING GRADE
- ROW - RESTORED TO PRE-CONSTRUCTION CONDITIONS

0 40 80
SCALE IN FEET

NOTES

1. EXISTING ASPHALT, CONCRETE, AND GRAVEL AREAS WILL REMAIN DURING THE INTERIM PERIOD BETWEEN SITE CLEANUP AND DEVELOPMENT.
2. BUILDING FOUNDATIONS THAT ARE OUTSIDE OF THE CLEANUP ACTION AREAS WILL REMAIN IN PLACE.
3. PERIMETER FENCING ALONG ROADWAYS WILL BE MAINTAINED DURING THE INTERIM PERIOD BETWEEN SITE CLEANUP AND DEVELOPMENT.

Rev	Date	Description	By

Client

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Scale As Noted

SCALE WARNING
Drawing is not to scale, if scale bar doesn't measure one inch

Designer	M. Byers
Drafter	C. Taylor
Checker	X
Reviewer	X

Upland AOC Cleanup Action Areas Interim Stabilization AS-BUILTS

Time Oil Bulk Terminal
Remediation Design
Seattle, Washington

Drawing No.
C-11

Sheet 25 of 26

File: C:\Users\cgreene\Downloads\CAD Files\Time Oil Bulk Terminal-AsbuiltC2 through C11.dwg Plot Date: June 20, 2022 Plotted by: Greene, Chris

Appendix B

Photographic Log

A. Site Prep

1. ASKO warehouse foundation pad. Warehouse demolition debris and steel hauled off. View to southeast. Photograph from 4/16/21

2. Building 2 (Parcel E) demolition underway. View to northeast. Photograph from 4/20/21.

3. Concrete removal at CAA-2 (area preparation).
View to the north. Photograph taken 7/29/2021.

4. Concrete breakup at CAA-4 (former loading dock).
View to the east/northeast. Photograph taken 7/29/2021.

5. Concrete hauling and recycling at CAA-5 (site preparation). View to the northeast. Photograph taken 7/29/2021.

B. CAA-1

6. CAA-1b excavation progress with odor suppressant foam (white foam) on CAA-1a. View to the southwest. Photograph taken 8/11/2021.

7. CAA-1b excavation. View to the east.
Photograph taken 8/13/2021.

8. CAA-1a - Backfilling and compacting gravel borrow at CAA-1a.
View to the northeast. Photograph taken 8/20/2021.

C. **CAA-2.b**

9.Installing soldier pile steel beams at CAA-2b/ROW.
View to the east. Photograph taken 9/9/2021.

10.CAA-2b, excavation with odor suppressant foam (white foam).
View to the east. Photograph taken 10/2/2021.

11. CAA-2b, density testing compacted gravel borrow, with mixed ReGenesis ORC (white pellets). View to the west. Photograph taken 10/15/2021.

12. CAA-2b trench box area excavation underway. View to the east. Photograph taken 10/16/2021.

13. CAA-2b ROW area, measuring cut soldier piles for SDOT inspector. View to the northeast. Photograph taken 10/21/2021.

14. CAA-2b ROW area, laying down and grading baserock for asphalt. View to the east. Photograph taken 10/25/2021.

15. Rainer Asphalt & Concrete laying down hot mix asphalt at ROW of CAA-2b. View to the east northeast. Photograph taken 10/26/2021.

D. **CAA-3**

16. CAA-3, pin flag at CAA3-SS-04 confirmation wall sample location (surface water collected at the bottom of the excavation).View to the south. Photograph taken 11/9/2021.

17. CAA-3, excavation completed, post-excavation survey underway.
View to the south. Photograph taken 11/11/2021.

18. CAA-3 largely backfilled, ballast rock at surface.
View to the north. Photograph taken 11/13/2021.

E. **CAA-5**

19. Excavating soils at CAA-5. View to the northeast. Photograph taken 8/2/2021.

20. CAA-5 excavation complete. View to the northeast. Photograph taken 8/3/2021.

21. Backfilling and compacting CAA-5 with ballast rock. View to the southwest. Photograph taken 8/17/2021.

F. **CAA-6**

22. CAA-6a floor and south wall PID-screening and sampling (pin flags). View to the south. Photograph taken 7/29/2021.

23A. CAA-6a. Two uncovered, buried drums. Shown in-situ.
View to the north. Photograph taken 7/26/2021.

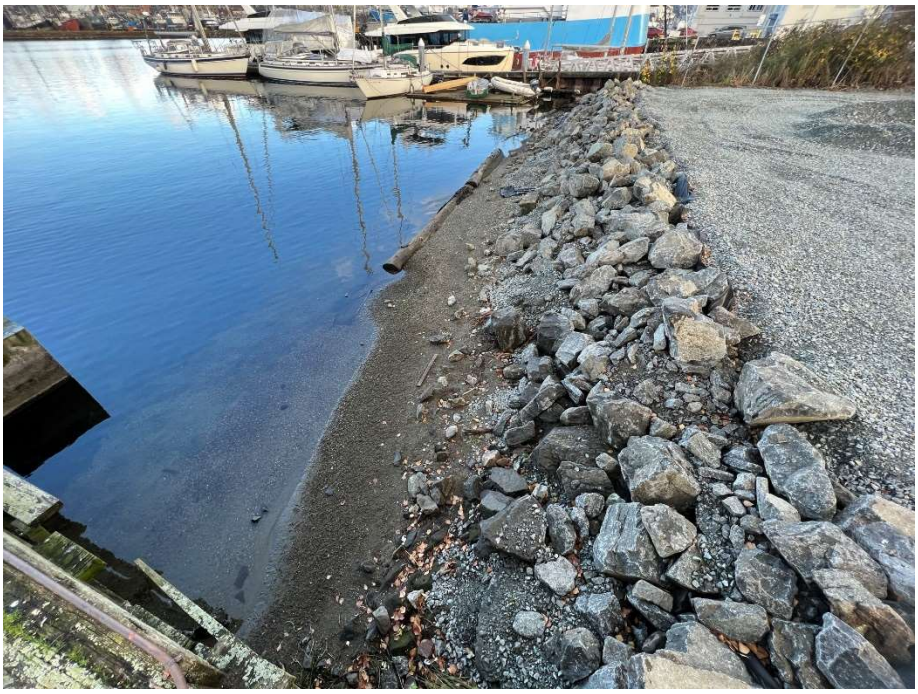
23B. Two 55-gallon drums removed from CAA-6a. Staged on plastic sheeting, bermed, contained in CAA-6a footprint. Photograph taken 7/26/2021.

24. Vaults along eastern perimeter of CAA-6a. Inside former building footprint. Photograph taken 7/22/2021.

25. CAA-6a excavation underway. View to the south. Photograph taken 8/3/2021.

26. CAA-6a. Quarry spall on bottom, adding gravel borrow.
View to the north. Photograph taken 8/23/2021.

27. Soil excavation at CAA-6b along eastern property line.
View to the northeast. Photograph taken 9/14/2021.



28. CAA-6b stabilized shoreline, rip-rap and ordinary high water area. SWPPP BMPs removed. View to the east. Photograph taken 11/23/2021.

G. **CAA-7**

29. Excavating soils at CAA-7. View to the north. Photograph taken 7/22/2021.

30.CAA-7 post-remedial surfaces. Site conditions at following completion of excavation at CAA-7. View to the west. Photograph taken 7/23/2021.

31. CAA-7 post-remedial surfaces. SWPPP BMPs in-place. View to west. Photograph taken 7/23/2021.

32. Backfilling and grading ballast rock at remediated CAA-7 excavation. View to the west. Photograph taken 7/29/2021.

H. **ISS – CAA-2.a, CAA-4 and Swell Management Area (SMA)**

33. CAA-2a, previously mixed ISS Cell 2-42.

View to the northeast. Photograph taken 8/23/2021.

34. Bucket mixing soils and grout at ISS Cell 2-38.
View to the west. Photograph taken 9/7/2021.

35. CAA-2a odor foam suppressant application (white foam in the photo). View to the south.
Photograph taken 9/24/2021.

36. CAA-2a completed surface photo. New black asphalt shows CAA-2b ROW. View to the east. Photograph taken 11/2/2021.

37. Bucket-mixing shallow soils and grout at CAA-4 along southern property line. View to the southwest. Photograph taken 9/10/2021.

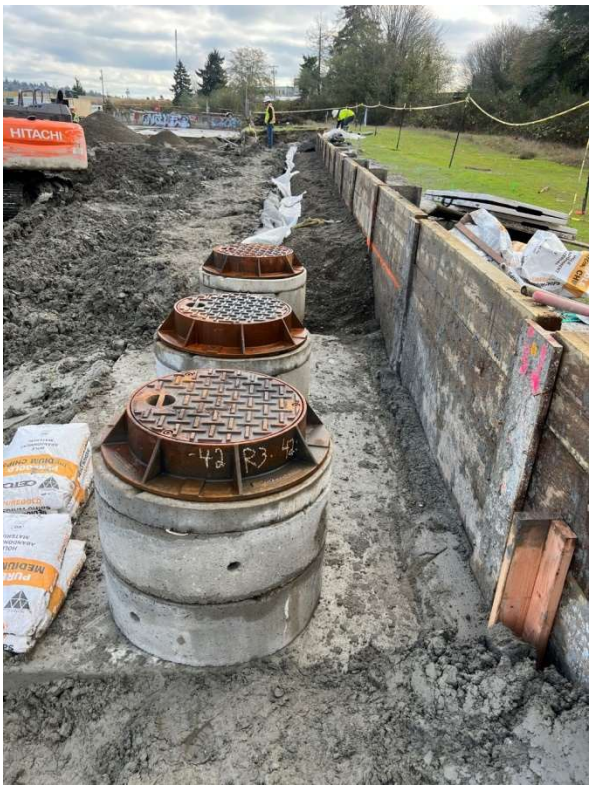
38. CAA-4, ISS bucket-mixing soil and grout at Cell 4-43.
View to the southwest. Photograph taken 10/26/2021.

39. CAA-4, positioning concrete vault along interceptor trench.
View to the east. Photograph taken 11/9/2021.

40. CAA-4, saturating gZVI prior to closing concrete vault. Photograph taken 11/11/2021.

41. CAA-4, hollow stem auger drilling gravity well.
View to the east. Photograph taken 11/12/2021.

42. CAA-4 interceptor trench installation underway. Most bedding sand/gZVI in-place, View to the southeast. Photograph taken 11/17/2021.



43. CAA-4 top of treatment vault, three manhole pipes in place (to be grout sealed). View to the east. Photograph taken 11/20/2021.

44. CAA-4 ISS material, covered in plastic sheeting.
View to the south. Photograph taken 11/23/2021.

45. CAA-4 interceptor trench area, covered in plastic sheeting as a BMP. Vault in center bottom, trench covered in geotextile and ballast rock. View to the east. Photograph taken 11/23/2021.

46. Completed CAA-4 surface. View to the south-east.
Photograph taken 12/15/2021.

47. Completed SMA Area. View to the east.
Photograph taken 12/13/2021.

I. Diesel Spill Area

48. Diesel Spill Area – Pre Cleanup. View to the west. Photograph taken 9/13/2021

49. Diesel Spill Area – Post Cleanup. View to the west.
Photograph taken 9/13/2021