CRETE Consulting Incorporated
16300 Christensen Road, Suite 214
Tukwila, WA 98188

Technical Memorandum

TO:	Melisa Bod
FROM:	Jamie Stevens, P.E. and Rusty Jones, L.G. – CRETE Consulting Inc.
PROJECT:	Port of Tacoma Parcel 15 (Portac) – 4215 State Route 509
SUBJECT:	2023 Roller-Compacted Concrete (RCC) Cap Inspection and Maintenance
DATE:	September 4, 2024
CC:	Rob Healy – Port of Tacoma

This technical memorandum (Tech Memo) documents the 2023 biennial environmental inspection of the existing roller-compacted concrete (RCC) Cap and stormwater conveyance system conducted by CRETE Consulting Inc. (CRETE) on behalf of the Port of Tacoma (Port) for the Parcel 15 (Portac) property (Site). The Site is located at 4215 State Route 509 – North Frontage Road, Tacoma, Washington (Figure 1).

The Port entered Agreed Order No. DE 15816 (Agreed Order) with the Washington State Department of Ecology (Ecology) on June 23, 2021, to implement the Phase 1 Cleanup activities. The Phase 1 Cleanup includes maintenance of the existing RCC cap. Cap inspection activities were conducted in accordance with the requirements identified in the Operations, Maintenance, and Monitoring Plan (OMMP; Aspect 2022). The cap was constructed in with gravel ballast and two layers of RCC and was graded to route stormwater runoff to catch basins and on to Wapato Creek outfalls. The extent of the cap is approximately 29.4 acres and depicted on Figure 2. The primary purpose for capping the Log Yard was to mitigate surface water impacts. The capping was also conducted to prevent stormwater infiltration through the slag/wood waste fill and reduce leaching of metals to groundwater.

Scope

The purpose of this Tech Memo is to document conditions of the RCC cap and stormwater conveyance system observed during the October 4 and 6, 2023 inspection performed by CRETE, as well as identify where maintenance is planned. Inspection activities included the following items:

- Inspection of the RCC cap for the presence of cracks and/or other failures in the pavement that allow surface water runoff to infiltrate the bark/slag surficial fill (e.g., cracks greater than 1/8 inch wide, exposed sub-base material, pavement edge deterioration, and general appearance)
- Evaluation of the structural and functional condition of the stormwater conveyance system (including catch basins, manholes, and oil/water separators)
- Evaluation of debris/sediment accumulation in the stormwater structures

Figure 2 shows the locations of key observations. Inspection observations are summarized on Tables 1 through 3.

Environmental Cap and Stormwater Drainage System Status

The previous cap inspection was conducted on December 17, 2021 by Aspect Consulting and is documented in Appendix A of the OMMP (Aspect 2022). Recommendations included the following to be completed after the 2023 RCC Cap inspection:

- Environmental Cap
  - Continued monitoring of all cracks wider than 1/8 inch and continued monitoring of gouges in the slurry overlay.
  - Cleaning out of the shallow surface channels (see X13, X16, and X17 on Figure 2) to allow water to flow out of areas with ponding.
- Stormwater Drainage System
  - All stormwater structures will continue to be maintained under the Port's Phase 1 Municipal Stormwater permit (MS4). It is recommended that accumulated sediment and debris be removed from inside and around the catch basins CB10, CB11, CBMH4, CMH6, CBMH7, and CBMH8 before the next inspection (Figure 2).

Field Observations

CRETE completed the inspection on October 4 and October 6, 2023.

Environmental Cap

The cap was inspected for the presence of exposed sub-base material and none was observed. Table 1 provides a summary of the cap conditions observed during the inspection. Table 2 lists the cracks observed on the environmental cap and provides additional details regarding cap condition.

At the time of CRETE's inspection, the general appearance of the environmental cap at the Site was good and was generally consistent with the previous cap inspection. Observed cracks wider than 1/8 inch are documented in Table 2 and locations are shown on Figure 2. Three engineered channels (X13, X16, and X17; Table 2) contained sediment and vegetation that is blocking water from flowing out of areas with ponding.

The edge of the cap was inspected and found to be in good condition. Some sections of curbs around the edge of the cap were observed to have been broken with sections pushed off the edge of the pavement in places. The condition of the curbs was not observed to be impacting the integrity of the cap or stormwater drainage system.

Stormwater Drainage Systems

The stormwater drainage system consists of three catch basins, eight catch basin manholes, one oil/water separator, two spill containment vessels, and two outfalls. Each drainage structure was inspected for structural and functional condition and debris and sediment accumulation. Observations made at each structure are summarized in Table 3.

Recommendations

Environmental Cap

Cracks wider than 1/8 inch and any gouges in the slurry overlay have been identified as specified in Table 2 and shown on Figure 2. Because these cracks are not expected to result in leakage, continued monitoring of the cracks and gouges is recommended at the next inspection event. The channels at X13, X16, and X17 should be cleaned out to allow water to flow out of areas with ponding.

Stormwater Drainage System

All stormwater structures will continue to be maintained under the Port's Phase 1 Municipal Stormwater permit (MS4). It is recommended that accumulated sediment and debris be removed from inside and around the catch basins CBMH3, CBMH4, CBMH5, CMH6, CBMH7, and CBMH8 before the next inspection (Figure 2; Table 3).

The maintenance identified as necessary in this Tech Memo should be completed before the next inspection scheduled in 2025 during other scheduled routine maintenance. The next inspection will include mapping areas of ponded water and cap maintenance activities will prioritize these areas. In accordance with the Site OMMP, biennial inspection and any maintenance of the existing RCC cap and the stormwater conveyance system will be reported to Ecology in a Cap Inspection and Maintenance Technical Memorandum (Tech Memo).

References

Aspect Consulting, LLC (Aspect), 2022, Operations, Maintenance, and Monitoring Plan, Final, Parcel 15 (Portac) Cleanup Phase 1, Tacoma, Washington, June 10, 2022.

Washington State Department of Ecology (Ecology), 2021, Cleanup Action Plan, Parcel 15 (Portac) – Port of Tacoma, July 6, 2021.

Attachments:

Tables
Figures

Tables

Table 1 Environmental Cap Condition Summary - 2023 Inspection (October 4 and 6, 2023)

Required Inspection Elements	Observed Condition	Recommended Actions
Presence of cracks wider than 1/8 inch	See Table 2	It is recommended that these cracks and gouges continued to be monitored and that channels at X13, X16, and X17 be cleaned out prior to the next inspection (Summer 2025).
Sub-base material exposed	No sub-base material was exposed.	None
Pavement edge deterioration	No pavement edge deterioration was observed.	None
Degradation, subsidence, general appearance	No degradation or subsidence was observed.	None

Table 2 Environmental Cap Field Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4, 2023

Location ID	Observations	Recommended Actions	Photographs
X1	crack in pavement; wider than 1/8 in; extends several >10 feet in three directions	observe at next inspection	
X2	crack in pavement; wider than 1/8 in; extends several >10 feet in three directions	observe at next inspection	
X3	several cracks in pavement; wider than 1/8 in; generally all less <1-feet	observe at next inspection	 
X4	cracks re-forming in patches; wider than 1/8 in; generally all less <1-feet	observe at next inspection	

Table 2 Environmental Cap Field Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4, 2023

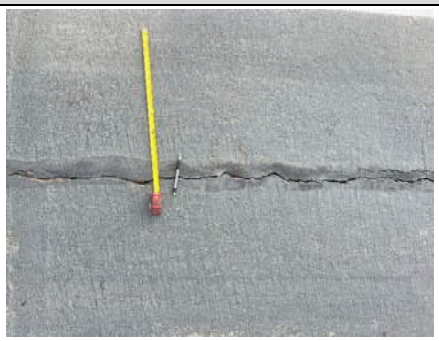
Location ID	Observations	Recommended Actions	Photographs
X5	intermittent cracks; wider than 1/8 in; generally all less 1 to 4-feet in length	observe at next inspection	
X6	cracks re-forming in patches; wider than 1/8 in; generally all less <1-feet	observe at next inspection	
X7	intermittent cracks; wider than 1/8 in; generally all less 1 to 6-feet in length	observe at next inspection	
X8	crack in pavement; wider than 1/8 in; one long linear joint extends >25 ft. east/west; another north/south ~25 ft	observe at next inspection	 

Table 2 Environmental Cap Field Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4, 2023

Location ID	Observations	Recommended Actions	Photographs
X9	intermittent cracks; wider than 1/8 in; generally all less 1 to 4-feet in length; extends east/west forming a linear joint	observe at next inspection	 
X10	intermittent linear joint crack in pavement; wider than 1/8 in; extends north/south; older patching cracking	observe at next inspection	
X11	several intermittent linear joint cracks in pavement; variable thickness, but wider than 1/8 in; extends east/west	observe at next inspection	
X12	intermittent cracks; wider than 1/8 in; generally all less 1 to 10-feet in length; vegetation forming in cracks	observe at next inspection	 

Table 2 Environmental Cap Field Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4, 2023

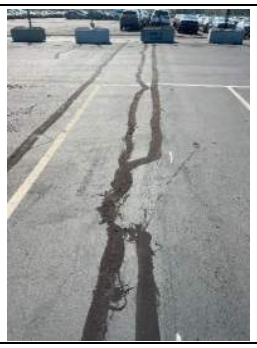
Location ID	Observations	Recommended Actions	Photographs
X13	channel in pavement; 3-4 in. wide; extends 40 ft. northwest/southeast	clear debris and vegetation, observe at next inspection	
X14	recent joint patching; extends east, west, north, south	observe at next inspection	
X15	recent patches over cracks in pavement; generally extending east/west; west edge of crack 0.5 - 1 inch higher than east edge;	observe at next inspection	
X16	cut channel in pavement; 4-5 in. wide; extends 40 ft. north/south	clear debris and vegetation, observe at next inspection	 

Table 2 Environmental Cap Field Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4, 2023

Location ID	Observations	Recommended Actions	Photographs
X17	cut channel in pavement; 4-5 in. wide; extends 20-40 ft. northwest/southeast	clear debris and vegetation, observe at next inspection	
X18	scours in pavement; scours not all the way through the pavement thickness	observe at next inspection	
X19	cracks re-forming in patches; wider than 1/8 in; generally all less <2-feet	observe at next inspection	
X20	crack in pavement; wider than 1/8 in; one long linear joint extends >25 ft. north/south	observe at next inspection	 

Table 3 Stormwater Structures Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4 & 6, 2023

Location ID	Type of Structure	Observed Condition	Sediment Accumulation (inches)	Additional Observations	Recommended Actions	Photos
CB11	catch basin	functioning normally	NM	none	remove accumulated debris from insert filter, continue to maintain catch basin under stormwater permit	
CBHM2	catch basin manhole	functioning normally	nm, none in surface basin	none	continue to maintain structure under stormwater permit	
CBMH3	catch basin manhole	functioning normally	approx. 3; some debris noted (see additional observations)	organic debris, vegetation, and sediment accumulation in catch basin	remove accumulated sediment and debris; continue to maintain structure under stormwater permit	
CBMH4	catch basin manhole	functioning normally	approx. 2; some debris noted (see additional observations)	organic debris, plastic debris, and sediment accumulation in catch basin; standing water of approximately 1/2 in. depth on south side of basin	remove accumulated sediment and debris; continue to maintain structure under stormwater permit	
CBMH5	catch basin manhole	functioning normally	NM	vegetation growing around perimeter of basin	remove accumulated vegetation; continue to maintain structure under stormwater permit	

Table 3 Stormwater Structures Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4 & 6, 2023

CBMH6	catch basin manhole	functioning normally	minor in catch basin; some debris and sediment around catch basin	sediment debris around basin grating; some vegetation growing around perimeter of basin	remove accumulated sediment and vegetation; continue to maintain structure under stormwater permit	
CBMH7	catch basin manhole	functioning normally	minor in catch basin; some debris and sediment around catch basin	sediment debris around basin grating; minor vegetation growing around perimeter of basin	remove accumulated debris and vegetation; continue to maintain structure under stormwater permit	
CBMH8	catch basin manhole	functioning normally	minor in catch basin; some debris and sediment around catch basin	sediment and rock debris around basin grating; vegetation growing around perimeter of basin	remove accumulated debris and vegetation; continue to maintain structure under stormwater permit	
YC-SL	unknown junction box	structurally intact; conduit and electrical wire through junction box	NM	uncertain of vault utility purpose; does not appear to be the oil/water separator; contains standing water	observe structure during next inspection	 
OWS	oil/water separator	not located	NM	none	none	

Table 3 Stormwater Structures Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4 & 6, 2023

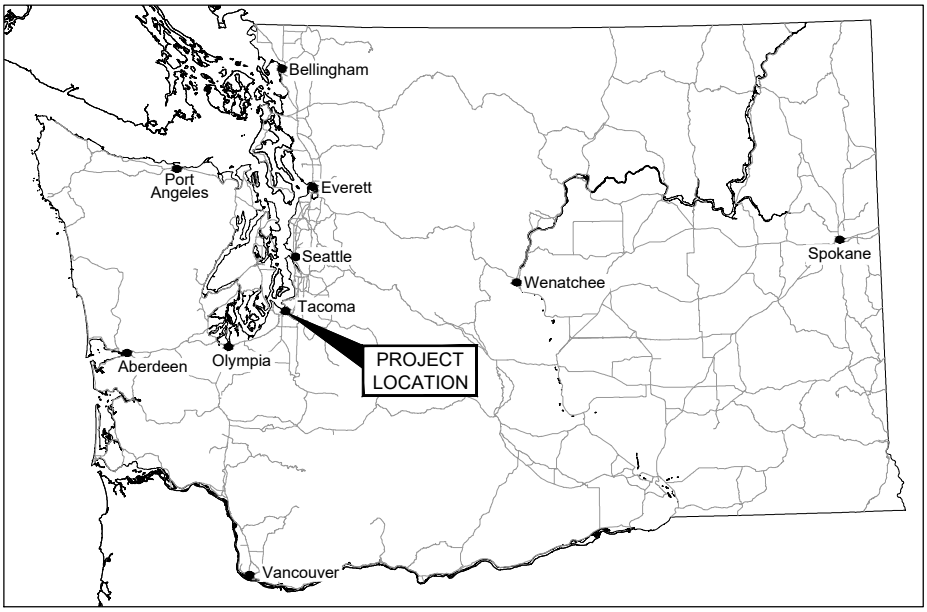
SV2	storm water vault	newly installed vault; appears to be functioning normally	NM (confined space); expected minimal	minimal standing water; no active water flow through vault.	no maintenance necessary	 
SV2L	conveyance line adjacent to SV2	manhole opening to main conveyance line adjacent to SV2 and discharging at OF2	NM (confined space); visually trace	minimal flowing water through conveyance line	no maintenance necessary	
OF2	outfall	functioning normally; accessible during low tide	NA	outfall and backflow valve appear to be functioning normally	no maintenance necessary	
SV3	storm water vault	newly installed vault; appears to be functioning normally	NM (confined space); expected minimal	minimal standing water; no active water flow through vault.	no maintenance necessary	 

Table 3 Stormwater Structures Observations
Port of Tacoma, Parcel 15 (Portac)
Conducted October 4 & 6, 2023

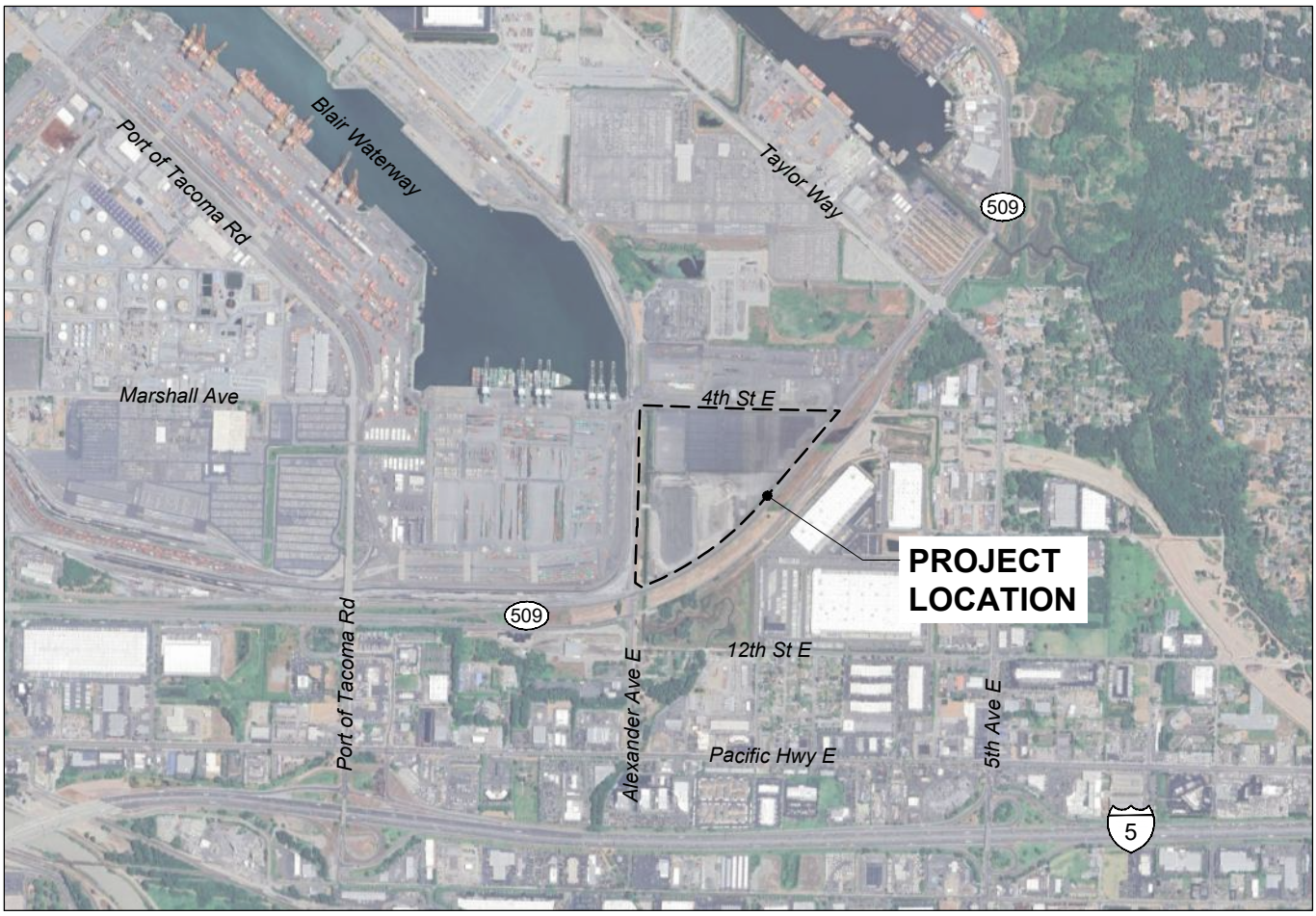
SV3L	conveyance line adjacent to SV3	manhole opening to main conveyance line adjacent to SV3 and discharging at OF3	NM (confined space)	flowing water through conveyance line	no maintenance necessary	
OF3	outfall	functioning normally; accessible during low tide	NA	outfall and backflow valve appear to be functioning normally	observe structure during next inspection	

Notes:
NA - not applicable
NM - not measured

Figures



WASHINGTON LOCATION MAP



VICINITY MAP

0 2,000 4,000

SCALE IN FEET

Source: Google Earth. Image date 7/18/2023

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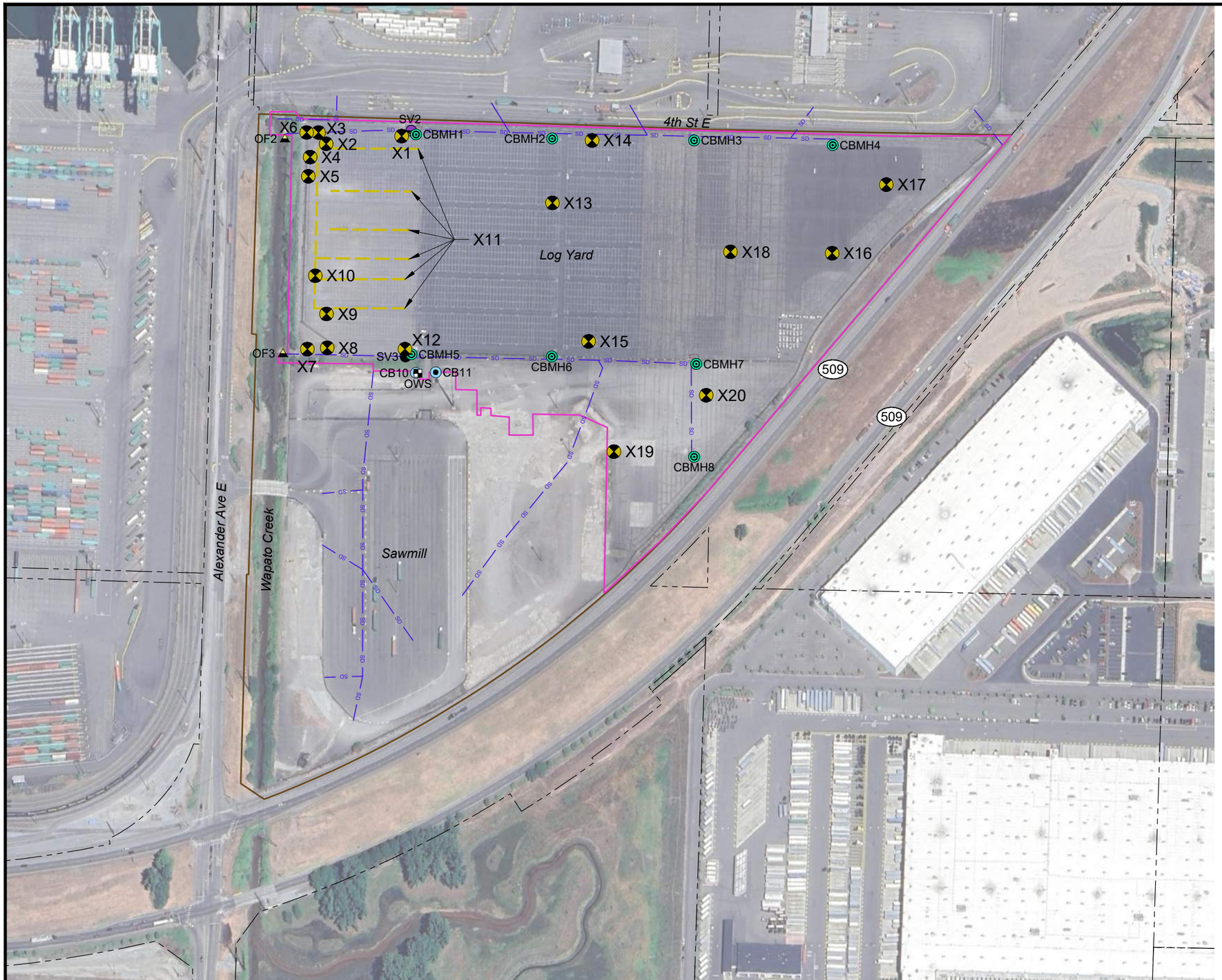
Port of Tacoma - Parcel 15 (Portac)
Cap Inspection Technical Memo
February 2024

Figure 1
Vicinity Map

File: PoTac Portac VicMap.dwg Layout: Vicmap



LEGEND

- Pavement - Field Observation (X)
- Catch Basin (CB)
- Catch Basin Manhole (CBMH)
- Oil/Water Separator (OWS)
- Outfall (OF)
- Spill Containment Vessel (SV)
- Storm Pipe
- Cap
- Port Parcel 15
- Pierce County Tax Parcel

N

0 300 600

Scale in Feet

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Figure 2
Field Observations
October 4 &6, 2023