



## **FINAL Third Periodic Review Cascade Timber 3 POT**

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**Thorne Rd & Maxwell, Tacoma, Pierce County, WA 98421  
Facility Site ID: 1206, Cleanup Site ID: 2693**

**Toxics Cleanup Program, Southwest Region**

Washington State Department of Ecology  
Lacey, Washington

April 2025

## Document Information

This document is available on the Department of Ecology's [Cascade Timber 3 POT cleanup site page](#).<sup>1</sup>

### Related Information

- Facility Site ID: 1206
- Cleanup Site ID: 2693

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<sup>1</sup> <https://apps.ecology.wa.gov/cleanupsearch/site/2693>

<sup>2</sup> <https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup>

<sup>3</sup> <https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility>

# Department of Ecology's Regional Offices

## Map of Counties Served



**Southwest Region**  
360-407-6300

**Northwest Region**  
206-594-0000

**Central Region**  
509-575-2490

**Eastern Region**  
509-329-3400

Region	Counties served	Mailing Address	Phone
<b>Southwest</b>	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
<b>Northwest</b>	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
<b>Central</b>	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
<b>Eastern</b>	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
<b>Headquarters</b>	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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# Introduction

The Washington State Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health and the environment are being protected at the Cascade Timber 3 POT [Port of Tacoma] cleanup site (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). This is the third periodic review conducted for this Site. Ecology completed the first and second periodic reviews in February 2012 and January 2017, respectively.

Cleanup activities at this Site were completed under a consent decree. Residual concentrations of arsenic and lead that exceeded MTCA cleanup levels remain on the property. The MTCA cleanup levels for soil are established under [WAC 173-340-745](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-745)<sup>4</sup>. The cleanup levels for groundwater and surface water are based on the U.S. Environmental Protection Agency's (EPA) marine chronic water quality criteria.

Ecology determined institutional controls in the form of a restrictive covenant would be required as part of the cleanup action for the Site. [WAC 173-340-420\(2\)](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-420)<sup>5</sup> requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because the department approved cleanup actions under a consent decree and institutional controls are required as part of the cleanup action.

When evaluating whether human health and the environment are being protected, Ecology must consider the following factors (WAC 173-340-420(4)):

- a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site;
- b) New scientific information for individual hazardous substances or mixtures present at the site;
- c) New applicable state and federal laws for hazardous substances present at the site;
- d) Current and projected site and resource uses;
- e) The availability and practicability of more permanent remedies; and
- f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

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<sup>4</sup> <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-745>

<sup>5</sup> <https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420>

# Summary of Site Conditions

## Site description and history

The Site is located along Maxwell Way between Port of Tacoma Road and Thorne Road in Tacoma, Pierce County, Washington and encompasses approximately 10.7 acres of land. The Site is within an industrial area with:

- Washington United Terminal to the northeast with Port of Tacoma Road and industrial properties beyond;
- East 19<sup>th</sup> Street to the southeast with industrial properties beyond;
- Thorne Road to the southwest with industrial properties beyond; and
- Maxwell Way to the northwest with industrial properties beyond.

From 1967 through June 1978, Nichiman America, Inc. leased the Site for use as a log sort yard. Cascade Timber Company then leased the Site for use as a log sort yard from 1978 through 1984. In 1982, Cascade Timber Company placed approximately 500 tons of slag generated by the American Smelting and Refining Company (ASARCO) on the Site to use as ballast material. In 1984, 7.84 acres to the north were developed. From 1984 through 1987, Cascade Timber Company leased both the Site and the 7.84 acres to the north for use as a log sort yard. During log sort yard operations, wood waste (primarily bark) was produced from loading, unloading, and movement of logs within the yard. The wood waste accumulated on top of the natural soil, dredged fill material, and ballast and was then mixed as a result of heavy vehicular traffic at the Site. The Site was not used after 1987, prior to the remedial activity at the Site.

The Port of Tacoma (Port) has owned the Site since at least 1991 when the Port first entered into an agreed order with Ecology to complete a Remedial Investigation (RI)/Feasibility Study (FS). In 1994, The Port entered into consent decree No. 94-2-03590-3 with Ecology to conduct cleanup activities at the Site. On August 2, 1994, a restrictive covenant was recorded for the Site.

Currently, the Port of Tacoma is leasing the Site to Washington United Terminal for queuing trucks for entry onto the main terminal on the north side of Port of Tacoma Road.

A vicinity map is in Appendix A, and a Site plan is in Appendix B. Photos of the current site condition are in Appendix C.

## Site investigations

In 1983, EPA identified Commencement Bay, where the Site is located, as a federal Superfund site. In February 1985, Ecology issued a report assessing stormwater runoff from numerous log sort yards, including the Site. The report concluded that stormwater runoff from log sort yards had levels of metals exceeding state water quality standards. In the 1989 Record of Decision for the Commencement Bay Nearshore/Tideflats Superfund Site, EPA identified the Cascade

Timber 3 POT site as a source of metals (arsenic, copper, zinc, and lead) discharging to Sitcum Waterway which feeds into Commencement Bay.

Between 1990 and 1991, Ecology collected samples of standing water on the Site, of stormwater runoff within a catch basin at the southern perimeter of the Site, and of stormwater runoff flowing from the Site towards a catch basin at the southwest corner. Results showed elevated metals concentrations above EPA marine water quality criteria. In 1991, Ecology also collected a sediment sample from a catch basin near the southwest corner of the Site. Results showed concentration of arsenic above Puget Sound marine sediment cleanup screening levels and marine sediment quality standards chemical criteria.

Ecology and the Port entered into an agreed order in 1991 to complete a RI/FS to investigate the extent of metals on the Site and to evaluate possible remedies. Harding Lawson Associates (HLA) conducted the RI between February 1992 and March 1993 (HLA 1994a). The purpose of the investigation was to evaluate metals associated with ASARCO slag at the Site and their extent in the soils, groundwater, and surface water (stormwater runoff) on and adjacent to the Site. Elevated concentrations of metals in soil generally corresponded to the distribution of slag. Antimony, arsenic, copper, lead, and zinc were detected at concentrations exceeding the typical range for soil in areas where slag was observed. Total petroleum hydrocarbons (TPH) were also detected in soils at concentrations up to 39,000 milligrams per kilogram (mg/kg).

There are two water bearing zones beneath the Site that are hydraulically separated by a silty clay layer that varies in thickness from 1 to 11-feet beneath the Site (HLA 1994a). Shallow groundwater ranged from 2.4 to 5.8 feet below ground level during the RI by HLA. Groundwater at the Site is not a current or potential source of drinking water since both water-bearing zones would be expected to produce small quantities of poor-quality water. Results of groundwater sampling from both zones during the RI indicated that groundwater is not currently a pathway for the migration of the metals of concern into the Sitcum Waterway.

Analytical results of stormwater sampling conducted during several different sampling events between 1983 and 1993 indicated that runoff is the primary pathway by which metals and TPH are transported from the log yard via storm drains to the Sitcum Waterway. The maximum detected concentrations during the RI of arsenic (435 micrograms per liter [ $\mu\text{g/L}$ ]), copper (567  $\mu\text{g/L}$ ), lead (231  $\mu\text{g/L}$ ), and zinc (21,300  $\mu\text{g/L}$ ) exceeded the federal marine water quality standards for both acute and chronic conditions.

## Cleanup actions

In 1993, a Cleanup Action Plan (CAP) was issued by Ecology describing the proposed remedial action for the Site. The Port entered into consent decree No. 94-2-03590-3 with Ecology on April 11, 1994. The CAP required the activities listed below to implement the selected alternative:

- Abandon existing monitoring wells.
- Prepare Site by removing vegetation, mixing bark/soil to create a layer with uniform thickness and composition, and regrading the Site.

- If the moisture content of the soil and wood is above the optimum moisture content for compaction, it will be aerated prior to cap placement.
- Install catch basins and drain lines.
- Compact base soil with a sheepsfoot roller to 95 percent of maximum dry density.
- Place crushed aggregate base rock over the compacted soil, followed by asphalt pavement.
- Install three new monitoring wells to monitor shallow groundwater quality.
- Prepare an Operation and Maintenance Plan specifying regular cap inspections and maintenance.
- Implementation of institutional controls prohibiting the disruption of the cap system without Ecology approval and limiting use of the Site to industrial activities.

Cleanup actions took place between May and August 1994 (HLA 1994b). The cap was designed to convey surface water drainage to the City of Tacoma's storm drain system. To facilitate potential future installation of utilities; all soil, bark, and slag with metals of concern were removed from corridors around and across the Site and placed in areas to be capped.

The surficial soil, bark, and slag was consolidated to areas on Site. The subgrade was prepared consisting of stripping, mixing, and regrading the existing material on Site. Mixing was performed to uniformly distribute the bark material and consequently make the resulting mixture suitable as a subgrade material. The soil/bark mixture ranged in thickness from 12 to 30 inches.

Following the preparation of the soil/bark subgrade, an aggregate base material was spread over the Site in 4- to 6-inch lifts. The aggregate base was placed to provide a more structural foundation layer over the soft subgrade material, upon which to place the low permeable cap and pavement section. Load bearing tests showed the collective materials were not providing the desired foundation for the pavement. The aggregate base material gradation was modified to allow for a higher percentage of larger aggregate for better strength properties. Additional lifts of the larger material, and asphalt permeated fabric, 2 inches of dense graded asphalt concrete pavement (ACP) material and 11.5 inches of additional Class E ACP, were added. The ACP material was placed in 2-to-3-inch lifts. The total asphalt section thickness is approximately 16.5 inches. The resulting average aggregate base thickness is approximately 24 inches.

Following cap construction, three new groundwater monitoring wells (MW-1, MW-2, MW-3S, and MW-3D) were installed including a dual completion well which allows sampling of both the shallow and deep aquifers in accordance with [WAC 173-160](https://app.leg.wa.gov/wac/default.aspx?cite=173-160)<sup>6</sup>, Minimum Standards for Construction and Maintenance of Wells.

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<sup>6</sup> <https://app.leg.wa.gov/wac/default.aspx?cite=173-160>



## Groundwater monitoring and cap maintenance

Per the 1994 Compliance Monitoring Plan by HLA, groundwater monitoring was to be performed on an annual basis and include analysis of samples for arsenic, copper, lead, and zinc (HLA 1994c). Sampling was conducted annually at all wells between 1994 and 1998. On October 8, 1999, Ecology approved the removal of the dual monitoring well, MW-3S and MW-3D, from the monitoring well network. Groundwater monitoring continued annually at MW-1 and MW-2 until 2011.

Between 1994 and 2011, concentrations of arsenic in groundwater exceeded the cleanup level in 12 samples from monitoring well MW-1, six samples from MW-2, and four samples from MW-3S. Concentrations of copper exceeded the cleanup level between 1994 and 2011 in six samples from MW-1, seven samples from MW-2, three samples from MW-3S, and three samples from MW-3D. Concentrations of zinc exceeded the cleanup level in samples collected in 1998 and 1999 from MW-1, samples collected in 1998 and 2000 from MW-2, and the sample collected from MW-3S in 1997.

Ecology and the Port entered into a Memorandum of Understanding (MOU) on September 12, 2011. The intention of the MOU was to standardize groundwater monitoring frequency and cap inspections among five sites with similar contaminants. Per this MOU, the Port is required to conduct groundwater monitoring every 18-months, which is the current frequency at the time of this periodic review.

Following implementation of the above MOU, groundwater sampling has been conducted at the Site in February 2012, August 2013, February 2015, August 2016, February 2018, August 2019, February 2021, February 2022, August 2022, and February 2024. During six of these sampling events, concentrations of arsenic exceeded the cleanup level in each MW-1 and MW-2. In addition, the concentration of copper during the February 2022 sampling event exceeded the cleanup level in MW-2. During the most recent sampling event conducted in February 2024, arsenic exceeded the cleanup level in both MW-1 and MW-2. However, concentrations of copper and lead were below their respective cleanup levels.

Per the Operation and Maintenance Plan, the cap was to be inspected semi-annually and repaired as needed. The storm drain system was also to be inspected and cleaned at least annually and as needed to assure that the design capacity is maintained. In addition, the detention vault was to be inspected and cleaned at least annually. The MOU issued on September 12, 2011, reduced the frequency of cap inspections to every 30 months, which is the current frequency at the time of this periodic review.

Per an email from the Port on March 6, 2024, following the 2022 inspection, pavement repairs including curb and side slope repairs were completed at the Site in November 2022 and extensive crack sealing across the entire cap area was performed in August 2023. The Port also noted in a separate email on March 15, 2024, that cap repairs were planned to occur at the Site on March 23 and 24, 2024. These repairs were to address asphalt depressions and include milling of pavement panels to a depth of 10-inches and replacement with new reinforced

concrete to eliminate the ongoing rutting and potholes that are occurring in the entry gate area due to truck traffic.

The most recent cap and drainage system inspection was conducted between August 19 and 20, 2024 by Maul Foster & Alongi, Inc. (MFA) and included the following (MFA 2024b):

- Inspection of the asphalt/concrete pavement for the presence of cracks or other failures in the pavement that allow surface water runoff to infiltrate the slag/bark surficial fill (e.g. cracks greater than 1/8 inch wide, subbase material exposed, pavement edge deterioration, and general appearance).
- Evaluation of the structural and functional condition of the cap and drainage systems (including catch basins, maintenance holes, oil/water separators, and spill containment vessels).
- Evaluation of debris/sediment accumulation in the stormwater structures (if visible).

Results of the 2024 inspection found the cap to be in generally good condition with minor asphalt damage across the cap. Several unsealed cracks wider than 1/8 inch were observed parallel to drive lanes on the cap. Gouges ranging in size from 1 to 3 feet long and approximately 1 inch deep were observed across the Site. Deeper tire ruts were observed across the width of the drive lines at the cap edge. Also observed were repairs of pavement edge erosion behind the curb in several areas of the cap. One of these repairs was beginning to crack at the surface of the gravel outside the curb. Several other sections of curb also showed deterioration on the backside of the curb and/or on the top of the curb.

The stormwater drainage system at the Site consists of six catch basins, one spill containment vessel, one oil/water separator, and one maintenance hole. The drainage system was inspected in 2024 for general appearance, sediment and debris accumulation (as visible), and structural and functional condition. In general, catch basins observed appeared to be structurally sound and functioning normally. At the time of the inspection, sediment accumulation and debris were observed in all catch basin inserts.

MFA made the following recommendations for the cap based on the 2024 inspection:

- Continue to monitor curb and slope deterioration at four locations.
- Reseal asphalt patch edges with missing sealant at five locations.
- Seal cracks observed at 13 locations.
- Repair asphalt depressions/divots at four locations.
- Monitor gouges, cracks, and depressions in asphalt at five locations.

The following recommendations were made for the stormwater drainage system:

- Consider replacing filter inserts and removing debris in all catch basins on a more frequent basis.
- Evaluate means to prevent stormwater runoff from bypassing catch basin 5 and reseal the area around the grate.

## Cleanup standards

Cleanup standards include cleanup levels, the location where these cleanup levels must be met (point of compliance), and any other regulatory requirements that apply to the Site.

[WAC 173-340-704](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704)<sup>7</sup> states MTCA Method A may be used to establish cleanup levels at sites that have few hazardous substances, are undergoing a routine cleanup action, and where numerical standards are available for all indicator hazardous substances in the media for which the Method A cleanup level is being used. Method B may be used at any site and is the most common method for setting cleanup levels when sites are contaminated with substances not listed under Method A. Method C cleanup levels may be used to set soil and air cleanup levels at industrial sites.

MTCA Method A cleanup levels for industrial land use were determined to be appropriate for contaminants in soil at this Site. The cleanup actions conducted at the Site were determined to be routine; few hazardous substances were found at the Site; numerical standards were available in the MTCA Method A table for each hazardous substance; the Site is located in a heavy industrial area, adjacent to other industrial properties; the Site is zoned for industrial use; and deed restrictions limit use of the Site to industrial activities.

EPA's marine chronic water quality criteria was determined to be appropriate for contaminants in groundwater and surface water at the Site. It is expected that discharge of groundwater contaminant concentrations below these criteria will result in surface water concentrations at or below acceptable levels. Cleanup levels for soil, groundwater, and surface water are listed in Table 1.

The 1993 CAP defines the points of compliance and compliance monitoring. Since contaminated soil is contained on Site under a cap, requirements of [WAC 173-340-740\(6\)\(d\)](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740(6)(d))<sup>8</sup> must be met which establishes the point of compliance in soils to be throughout the Site from ground surface to 15 feet below ground surface. This represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of Site development activities.

Because hazardous substances are contained on the Site, the groundwater points of compliance are on the perimeter of the cap system near the property boundary and in the uppermost aquifer system.

## Restrictive covenant

Ecology determined that institutional controls would be required as part of the cleanup action to document the remaining contamination, protect the cleanup action, and protect human

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<sup>7</sup> <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704>

<sup>8</sup> <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740>

health and the environment. On August 2, 1994, institutional controls in the form of a [restrictive covenant](#)<sup>9</sup> (Covenant) were recorded for the Site.

The Covenant recorded for the Site imposes the following limitations:

1. The Site may be used only for industrial uses as defined in and allowed under the City of Tacoma's Zoning Requirements codified in the Tacoma City code as of the date of the Covenant.
2. Any activity on the Site that interferes with or reduces the effectiveness of the cleanup action or any operation, maintenance, monitoring, or other activity required by the Order (or any Ecology-approved modification or amendment to the Order) is prohibited. Any activity on the Site that would threaten the structural integrity of the cap is prohibited. Any activity on the Site that would result in the release of a hazardous substance that was contained as a part of the cleanup action is prohibited. It is understood that disturbance of the cap may be required in the future for installation of utilities or other activities associated with future industrial use of the Site. The Port shall obtain approval from Ecology prior to initializing any disturbance of the cap stormwater drainage and/or monitoring system. Ecology shall not deny approval if the Port can show (1) that no releases of hazardous materials will occur; (2) integrity of the cap and stormwater drainage and monitoring systems will be restored to their original condition in a timely manner; and (3) that material will be handled and disposed of in accordance with State law.
3. The owner of the Site must give written notice to Ecology, or to a successor agency, of the owner's intent to convey any interest in the Site. No conveyance of title, easement, lease, or other interest in the Site shall be consummated by the owner without adequate and complete provision for the continued operation, maintenance, and monitoring of the cleanup action.
4. The owner shall allow authorized representatives of Ecology, or of a successor agency, the right to enter the Site at reasonable times for the purpose of evaluating compliance with the CAP and the Order, to take samples, to inspect cleanup actions conducted at the Site, and to inspect records that are related to the cleanup action.
5. The owner of the Site and owner's assigns and successors in interest reserve the right under WAC 173-340-440 to record an instrument which provides that this Covenant shall no longer limit the use of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of Ecology or of a successor agency. Ecology or a successor agency may consent to the recording of such an instrument only after public notice and comment.

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<sup>9</sup> <https://apps.ecology.wa.gov/cleanupsearch/document/83408>

# Periodic Review

## Effectiveness of completed cleanup actions

During the Site visit conducted on February 14, 2024, Ecology found no indications that the integrity of the cleanup action has been compromised. The Site is currently leased to Washington United Terminal for queuing trucks for entry onto the main terminal on the north side of Port of Tacoma Road. A photo log is in Appendix C.

## Direct contact

The cleanup actions were intended to eliminate exposure to contaminated soil and groundwater at the Site. Exposure pathways to contaminated soils by ingestion and direct contact were reduced by installation of a cap over the entire Site. The cap appears to be in satisfactory condition and no repair, maintenance, or contingency actions are required at this time. Evidence of previous repairs were observed during the Site visit.

As per the requirements of the 2011 MOU, groundwater sampling continues to be conducted every 18-months and cap inspections continue to be conducted at the Site every 30-months. Groundwater at the Site is not a current or potential future source of drinking water because the water-bearing zones beneath the Site are expected to produce small quantities of relatively poor-quality water. Groundwater quality is therefore evaluated with respect to its ability to discharge to the closest surface water body. The results of the most recent sampling event in February 2024 found concentrations of arsenic above the cleanup level in both monitoring wells MW-1 and MW-2. These exceedances appear generally consistent with historical concentrations detected at the Site and do not appear to indicate either an increasing or decreasing trend in concentrations.

Analytical results for groundwater sampling conducted between 1994 and 2024 are presented in Tables 2 through 5. Trend plots depicting arsenic and copper concentrations over time are presented in Figures 1 and 2, respectively.

The next groundwater sampling event is due in August 2025.

## Institutional controls

Institutional controls in the form of a Covenant were implemented at the Site in 1994. The Covenant remains active and discoverable through the Pierce County Auditor. Ecology found no evidence a new instrument has been recorded that limits the effectiveness or applicability of the Covenant. This Covenant prohibits activities that will result in the release of contaminants contained as part of the cleanup action and prohibits any use of the property that is inconsistent with the Covenant, unless approved by Ecology in advance. This Covenant ensures the long-term integrity of the cleanup action will be protected.

## **New scientific information for individual hazardous substances or mixtures present at the Site**

There is no new relevant scientific information for the hazardous substances remaining at the Site.

## **New applicable state and federal laws for hazardous substances present at the Site**

The cleanup at the Site was governed by Chapter 173-340 WAC (1993 ed.). WAC 173-340-702(12) (c) [2023 ed.] provides that,

“A release cleaned up under the cleanup levels determined in (a) or (b) of this subsection shall not be subject to further cleanup action due solely to subsequent amendments to the provisions in this chapter on cleanup levels or subsequent availability of more sensitive analytical methods, unless the department determines, on a case-by-case basis, that the previous cleanup action is no longer sufficiently protective of human health and the environment.”

The current MTCA Method A cleanup level for arsenic in soil has been reduced from 200 mg/kg to 20 mg/kg since the final enforcement order was issued. Because contaminated soils at the Site have been capped, the modification to the MTCA cleanup level does not represent an increase in risk to human health or the environment.

Several of the EPA marine chronic water quality criteria have also changed since the enforcement order was issued. The criteria for copper increased from 2.9 µg/L to 3.1 µg/L. The criteria for lead decreased from 8.5 µg/L to 8.1 µg/L. The criteria for zinc decreased from 86 µg/L to 81 µg/L. A review of more recent groundwater data from 2012 to 2024 indicates that the value for copper was exceeded in one sample collected from MW-2 in February 2022. However, values for lead and zinc have not been exceeded in MW-1 or MW-2 since 2002. Overall, the changes to the original standards have not resulted in the need for additional remedial actions at the Site.

## **Current and projected Site and resource uses**

The Site is used for industrial purposes. The Site is currently leased to Washington United Terminal for queuing trucks for entry onto the main terminal on the north side of Port of Tacoma Road. There have been no changes in current or projected future Site or resource uses. The current Site use is not likely to have a negative impact on the protectiveness of the cleanup action.

## Availability and practicability of more permanent remedies

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. While more permanent remedies may be available, they are still not practicable at this Site.

## Availability of improved analytical techniques to evaluate compliance with cleanup levels

The analytical methods used at the time of the cleanup action were capable of detection below the selected cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

## Conclusions

- The cleanup actions completed at the Site appear to be protective of human health and the environment.
- Soil cleanup levels have not been met at the Site; however, the cleanup action is determined to comply with cleanup standards under WAC 173-340-740(6)(f), since the long-term integrity of the containment system is ensured and the requirements for containment technologies have been met.
- Groundwater monitoring is required on an 18-month frequency. Recent sampling events including the latest sampling event in February 2024 have detected arsenic at concentrations above cleanup levels in both MW-1 and MW-2, as well as copper at a concentration above the cleanup level in MW-2 during the February 2022 sampling event. These exceedances appear generally consistent with historical concentrations detected at the Site and do not appear to indicate either an increasing or decreasing trend in concentrations. Groundwater monitoring is recommended to continue at the current frequency.
- The Covenant for the property is in place and is effective in protecting human health and the environment from exposure to hazardous substances and the integrity of the cleanup action.
- The cap appears to be in satisfactory condition, and no repair, maintenance, or contingency actions are required at this time.

Based on this periodic review, Ecology has determined the requirements of the Covenant are being followed. No additional cleanup actions are required by the property owner at this time. The property owner is responsible for continuing to inspect the Site to ensure the integrity of the cap is maintained and to continue groundwater monitoring.

## **Next review**

Ecology will schedule the next review for the Site five years from the date of this periodic review. If additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years after those activities are completed.



## References

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- Ecology. 2012. Periodic Review, Cascade Timber 3 POT, Facility Site ID#: 1206. February.
- Ecology. 2017. Second Periodic Review Report, Cascade Timber 3 POT, Facility Site ID#: 1206, Cleanup Site ID#: 2693. January.
- Ecology. 2024. Site visit. February 2024.

## Tables

**Table 1.** Cleanup levels for soil, groundwater, and surface water contaminants.

Contaminant	Soil Cleanup Level (mg/kg) <sup>1</sup>	Groundwater Cleanup Level (µg/L) <sup>2</sup>	Surface Water Cleanup Level (µg/L) <sup>2</sup>
Arsenic	200	36	36
Copper	NA	2.9	2.9
Lead	1,000	8.5	8.5
Zinc	NA	86	86

Notes:

<sup>1</sup> Soil cleanup levels are the MTCA Method A cleanup levels for industrial land use available at the time when the 1993 Cleanup Action Plan was issued.

<sup>2</sup> Groundwater and surface water cleanup levels are the EPA's marine chronic water quality criteria available at the time when the 1993 Cleanup Action Plan was issued.

µg/L = micrograms per liter

mg/kg = milligrams per kilogram

MTCA = Model Toxics Control Act

NA = not applicable

**Table 2.** Groundwater contaminant concentrations at MW-1.

Date	Sample Type	Dissolved Arsenic (µg/L)	Dissolved Copper (µg/L)	Dissolved Lead (µg/L)	Dissolved Zinc (µg/L)
11/28/1994	N	940	8	<3	<20
12/09/1994	N	220	4	<3	<20
12/01/1995	N	132	4	<1	53
12/13/1996	N	93	6	<1	9
12/09/1997	N	60	2.1	2.4	12
12/07/1998	N	9.7	11	3.6	510
12/22/1999	N	21.0	2.5	<1	99
10/11/2000	N	73	<1	<0.5	4.7
11/03/2000	N	14.0	--	--	--
11/16/2001	N	7.02	8.73	<0.5	<4
11/26/2002	N	13.4	<2.5	<0.5	<2.5
11/14/2003	N	18.4	<1.0	<0.5	5.2
10/29/2004	N	32.4	<2.5	<2.5	12.2
10/26/2005	N	46	<2.5	<2.5	<2.5
01/29/2007	N	93	<2.0	<2.0	<5.0
02/08/2008	N	140	<0.55	<0.22	5.2 J
02/27/2009	N	57.2	<0.5	<1	6
02/04/2010	N	50.3	0.6	<1	<4
02/22/2011	N	158	<0.5	<0.5	0.8
02/13/2012	N	53	<0.5	<0.5	--
08/23/2013	N	28.6	<0.5	<0.5	--
02/12/2015	N	57.7	0.7	<0.1	--
08/26/2016	N	24.2	<0.5	<0.1	--
02/12/2018	N	66	<0.5	<0.1	--
08/23/2019	N	20	<0.5	<0.1	--
08/23/2019	FD	20.4	<0.5	<0.1	--
02/19/2021	N	283	<2.5	<5.0	<25
02/27/2022	N	67.0	<0.10	<0.020	--
02/27/2022	FD	63.5	<0.10	<0.020	--
08/21/2022	N	18.9	0.06 J	< 0.006	--
2/17/2024	N	41.7	<0.360	<0.180	--

Notes:

**Highlighted, red bold text** = exceedance of the cleanup level

-- = not analyzed

< = result is non-detect at the reporting limit

µg/L = micrograms per liter

FD = field duplicate

J = estimated value

MW = monitoring well

N = normal environmental sample

**Table 3.** Groundwater contaminant concentrations at MW-2.

Date	Sample Type	Dissolved Arsenic (µg/L)	Dissolved Copper (µg/L)	Dissolved Lead (µg/L)	Dissolved Zinc (µg/L)
11/28/1994	N	10	3	<3	<20
12/01/1995	N	--	--	--	--
12/01/1995	FD	132	5	<1	53
12/13/1996	N	3	5	<1	<83
12/13/1996	FD	76	41	1	18
12/09/1997	FD	54	6.1	2.4	43
12/16/1997	N	5	<2	<1	6
12/07/1998	N	2.3	1.8	5.1	360
12/07/1998	FD	12	13	1.2	600
12/22/1999	N	4.4	<2	23	6.9
12/22/1999	FD	19	2.9	<1	38
10/11/2000	N	<1	<1	<1	99
10/11/2000	FD	42	<1	<0.5	6.5
11/03/2000	N	2	<1	600	8.3
11/03/2000	FD	7	--	--	--
11/13/2000	N	--	--	600	--
11/16/2001	FD	7.69	10.2	<0.5	<4
11/19/2001	N	1.19	<1	3.74	38.6
11/26/2002	N	<2.5	<2.5	180	3.36
11/26/2002	FD	19.7	<2.5	<0.5	<2.5
11/14/2003	N	8.91	<1.0	<0.5	4.64
11/14/2003	FD	18.5	<1.0	<0.5	3.97
10/29/2004	N	25.4	<2.5	<2.5	<5
10/29/2004	FD	31.9	<2.5	<2.5	7.15
10/26/2005	N	39	<2.5	<2.5	<2.5
10/26/2005	FD	32	<2.5	<2.5	<2.5
01/29/2007	N	34	<2.0	<2.0	<5.0
01/29/2007	FD	35	<2.0	<2.0	<5.0
02/08/2008	N	24	0.78 J	<0.22	5.1 J
02/08/2008	FD	140	<0.55	<0.22	6.0 J
02/27/2009	N	32.6	1.6	<1	6
02/27/2009	FD	32.9	1.5	<1	<4
02/04/2010	N	8.1	4.1	<1	<4
02/04/2010	FD	18.2	5.4	<1	<4
02/22/2011	N	27.2	<0.5	<0.5	0.8
02/22/2011	FD	26.9	0.5	<0.5	1.1
02/13/2012	N	16	0.5	<0.5	--
02/13/2012	FD	16	0.6	<0.5	--
08/23/2013	N	4.1	<0.5	<0.5	--

Date	Sample Type	Dissolved Arsenic (µg/L)	Dissolved Copper (µg/L)	Dissolved Lead (µg/L)	Dissolved Zinc (µg/L)
08/23/2013	FD	4.0	<0.5	<0.5	--
02/12/2015	N	<b>41.6</b>	2.0	0.1	--
02/12/2015	FD	<b>40.7</b>	1.8	0.1	--
08/26/2016	N	23.6	<0.5	<0.1	--
08/26/2016	FD	26.5	<0.5	<0.1	--
02/12/2018	N	<b>63.6</b>	1.96	0.092 J	--
02/12/2018	FD	<b>60</b>	2.43	0.112	--
08/23/2019	N	<b>102</b>	<0.5	<0.1	--
02/19/2021	N	<b>42.0</b>	<2.5	<5.0	<25
02/19/2021	FD	<b>43.6</b>	<2.5	<5.0	<25
02/27/2022	N	<b>96.2</b>	<b>5.01</b>	0.125	--
08/21/2022	N	6.36	2.06 J	0.096 J	--
08/21/2022	FD	6.40	0.19 J	< 0.020	--
2/17/2024	N	35.6	1.22	<0.180	--
2/17/2024	FD	<b>36.3</b>	1.17	<0.180	--

Notes:

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µg/L = micrograms per liter

FD = field duplicate

J = estimated value

MW = monitoring well

N = normal environmental sample

**Table 4.** Groundwater contaminant concentrations at MW-3S.

Date	Sample Type	Dissolved Arsenic (µg/L)	Dissolved Copper (µg/L)	Dissolved Lead (µg/L)	Dissolved Zinc (µg/L)
11/28/1994	N	25	28	<3	<20
12/01/1995	N	54	3	2	65
12/13/1996	N	190	<2	3	9
12/09/1997	N	63	2	4.2	330
12/07/1998	N	50	2.9	2.2	<5

Notes:

**Highlighted, red bold text** = exceedance of the cleanup level

< = result is non-detect at the reporting limit

µg/L = micrograms per liter

MW = monitoring well

N = normal environmental sample

**Table 5.** Groundwater contaminant concentrations at MW-3D.

Date	Sample Type	Dissolved Arsenic (µg/L)	Dissolved Copper (µg/L)	Dissolved Lead (µg/L)	Dissolved Zinc (µg/L)
11/28/1994	N	20	<b>7</b>	<3	<20
12/01/1995	N	3	<b>4</b>	<1	35
12/13/1996	N	4	<b>14</b>	<5	18
12/09/1997	N	27	2.2	2	17
12/07/1998	N	3	<2	<1	7.8

Notes:

**Highlighted, red bold text** = exceedance of the cleanup level

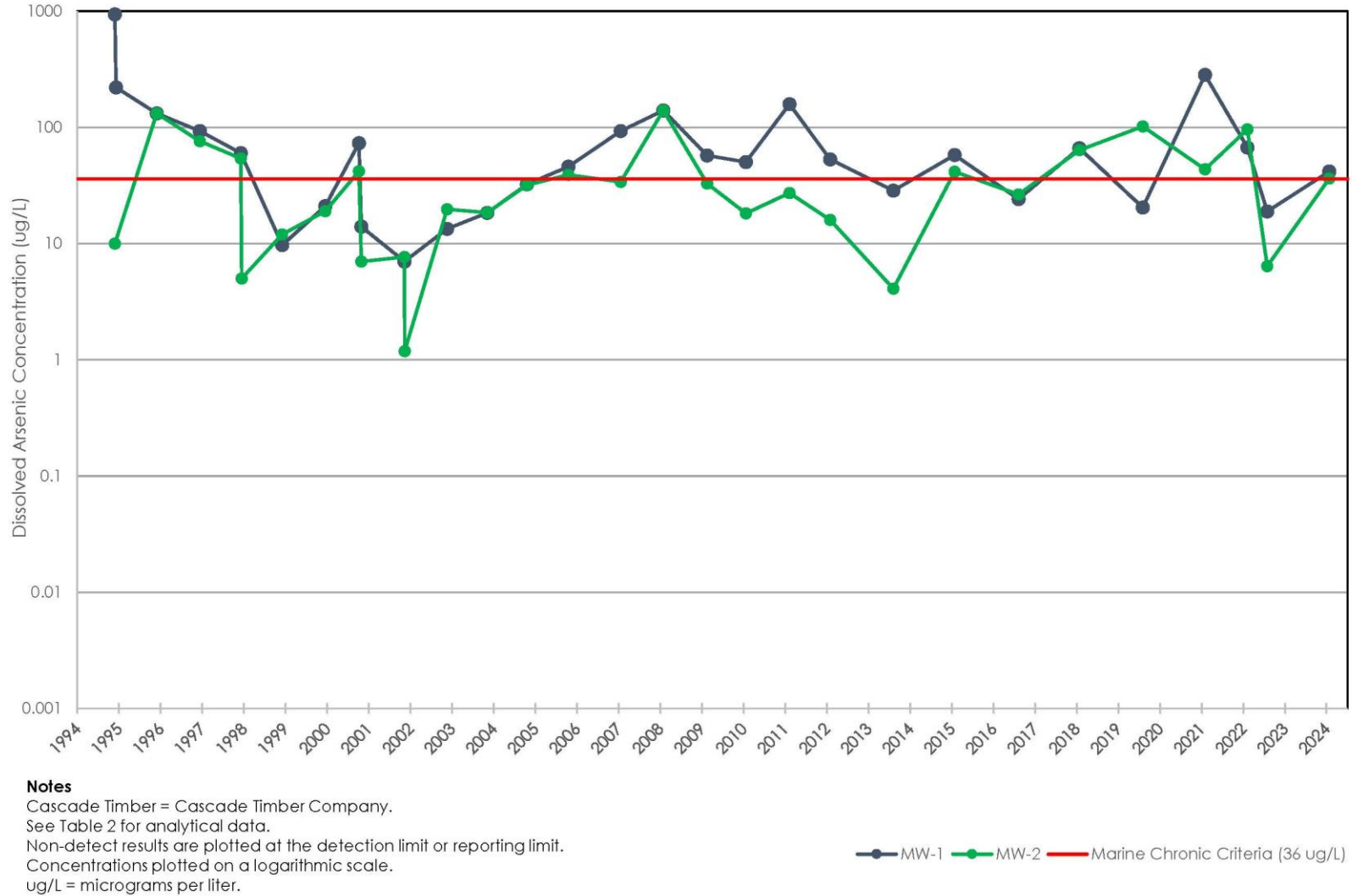
< = result is non-detect at the reporting limit

µg/L = micrograms per liter

MW = monitoring well

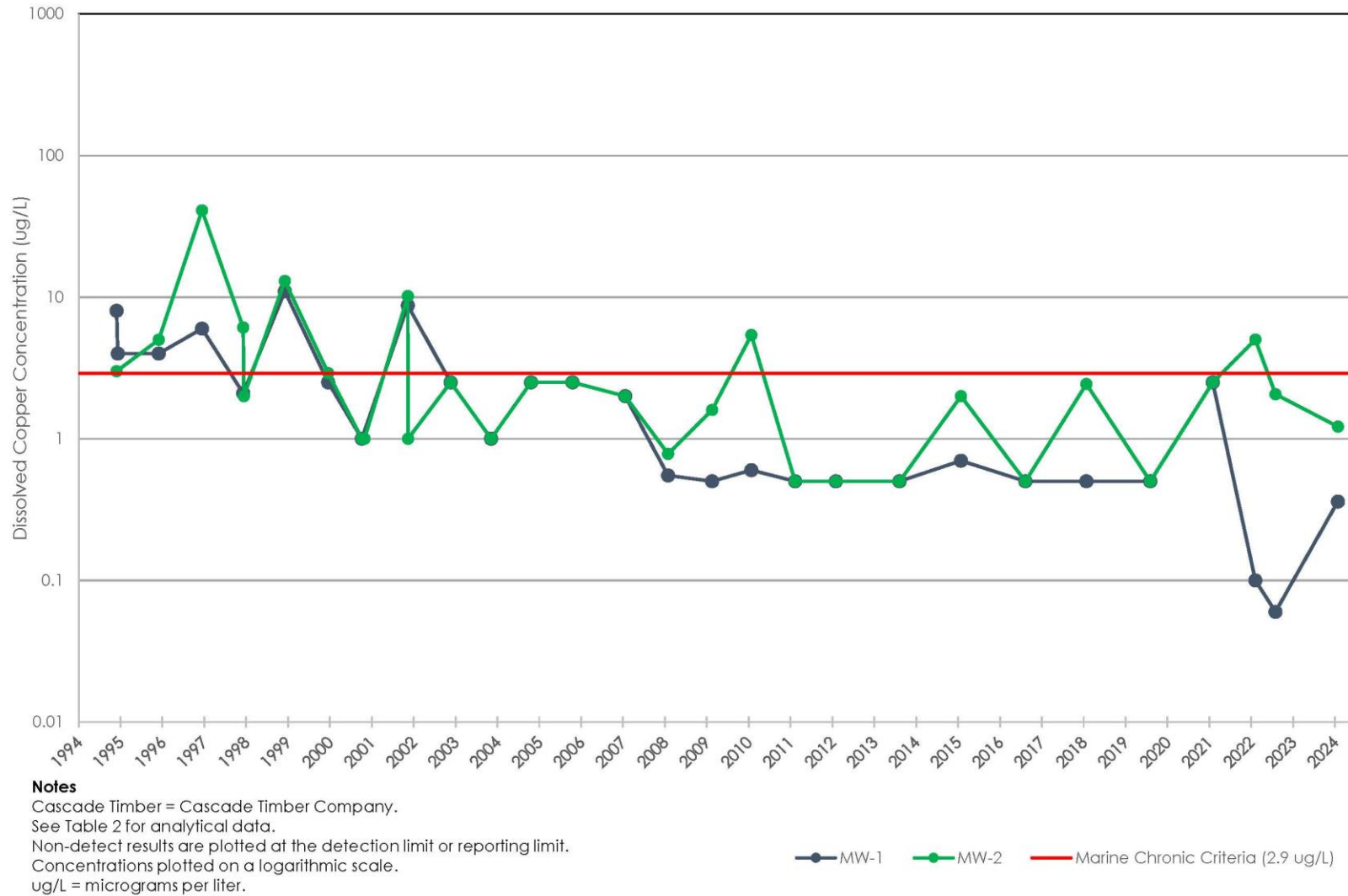
N = normal environmental sample

## Figures



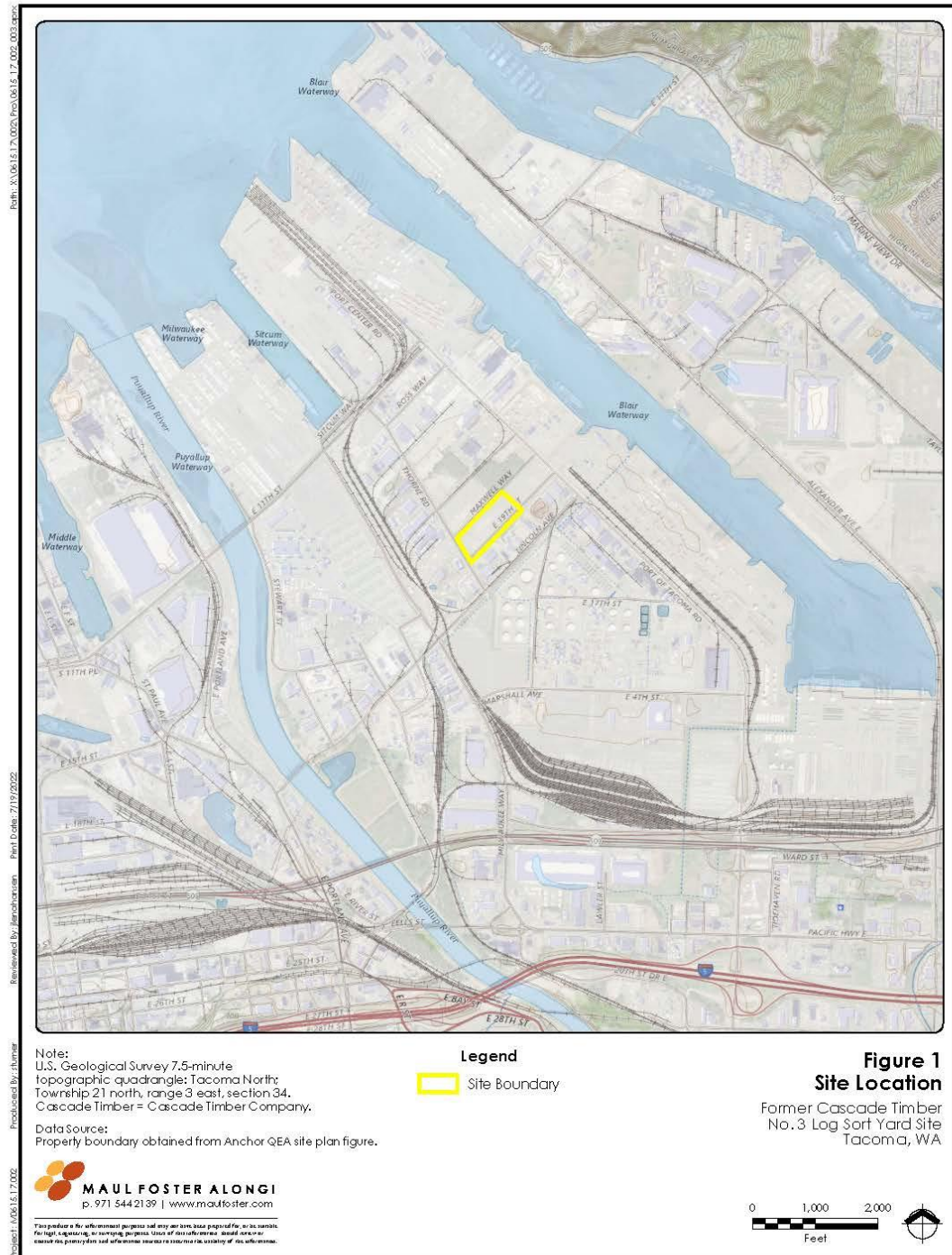
**Figure 1.** Dissolved Arsenic Trend Plot – 1994 to 2024 (MFA 2024a)





**Figure 2.** Dissolved Copper Trend Plot – 1994 to 2024 (MFA 2024a)

# Appendix A. Vicinity Map



## Appendix B. Site Plan





## Appendix C. Photo Log

**Photo 1 (facing north): View of the capped area near the southwest entrance to the Site.**



**Photo 2 (facing northwest): View of the southwest portion of the capped area from the eastern boundary of the Site.**



**Photo 3 (facing north): View of the south-central portion of the capped area from the eastern boundary of the Site.**



**Photo 4 (facing northeast): View along the eastern boundary of the capped area.**





**Photo 5 (facing southwest): View of the south-central portion of the capped area from the eastern boundary of the Site.**



**Photo 6 (facing southwest): View of the southwest portion of the capped area.**



**Photo 7 (facing southeast): View of the northern portion of the capped area from the western boundary of the Site.**



**Photo 8 (facing south): View along the western boundary of the capped area.**

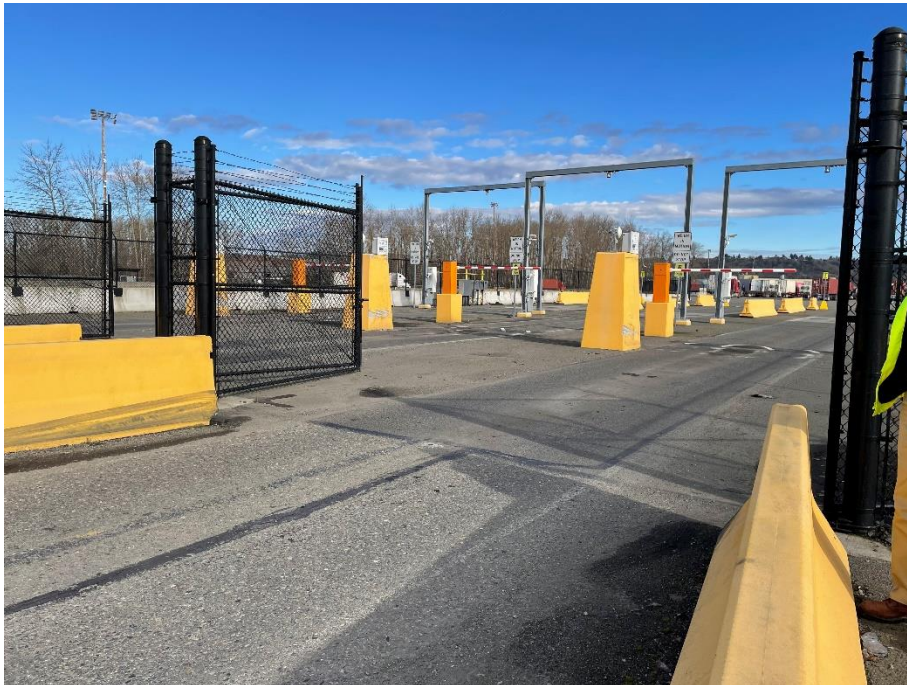




**Photo 9 (facing northeast): View of previous cap repairs along the eastern portion of the capped area.**



**Photo 10 (facing north): View of weigh stations within the south-central portion of the Site.**





**Photo 11 (facing not applicable [NA]): View of a catch basin on the southeastern portion of the Site.**



**Photo 12 (facing NA): View of monitoring well MW-1 along the eastern boundary of the Site.**





**Photo 13 (facing northeast): View of monitoring well MW-2 along the western boundary of the Site.**

