Five-Year Review Report

Executive Summary
of
Third Five-Year Review Report
for
Commencement Bay Nearshore/Tideflats
Superfund Site
Tacoma, Washington

December 23, 2009

Executive Summary

This document presents the Five-Year Review for the Commencement Bay Nearshore/Tideflats Superfund site (CB/NT site) in Tacoma, Washington. This National Priorities List (NPL) site is divided into six Operable Units (OUs):

OU 01 Commencement Bay Nearshore/Tideflats Sediments.

OU 02 Asarco Tacoma Smelter Facility (currently renamed OU 20).

OU 03 Tacoma Tar Pits.

OU 04 Asarco Off-Property (referred to as Ruston/North Tacoma Study Area, currently renamed OU 22).

OU 05 Commencement Bay Nearshore/Tideflats Sources (associated with OU 01).

OU 06 Asarco Sediments (referred to as Asarco Sediments/Groundwater, currently renamed OU 19).

For the CB/NT site, there are three separate project areas that are being managed as distinct sites. These project areas include the Commencement Bay Nearshore/Tideflats Sediments and Sources (OU 01 and OU 05); the Asarco Smelter Facility and surrounding impacted areas (OU 20, OU 22, and OU 19); and the Tacoma Tar Pits (OU 03). The CB/NT Sediments OU (OU 01) includes eight contaminated sediment Problem Areas, within six marine waterways. These Problem Areas consist of the Head and Mouth of Hylebos Waterway, Sitcum Waterway, St. Paul Waterway, Middle Waterway, Head and Mouth of Thea Foss Waterway, and Wheeler-Osgood Waterway. The CB/NT Sediments OU also includes two non-time-critical removal actions known as the Olympic View Resource Area and the Occidental Site. The CB/NT Sediments and Sources OUs are under one Record of Decision (ROD). The CB/NT Asarco OUs (OU 20, OU 22, and OU 19) are addressed by three RODs, and the Tacoma Tar Pits OU (OU 03) is addressed by one ROD. This Five-Year Review addresses all OUs, except for CB/NT Sources.

Cleanup of the OUs addressed in this Five-Year Review has been conducted by Responsible Parties, under oversight by the U.S. Environmental Protection Agency (EPA). For CB/NT Sources (OU 05), the Washington Department of Ecology (Ecology) is lead agency for CB/NT source control actions. The strategic relationship and importance of coordination between EPA and Ecology regarding sediment cleanup and source control actions is described in Section 5.2 of the CB/NT ROD (OU 01 and OU 05). Since Ecology has the lead in addressing upland contaminant source areas, this Five-Year Review contains limited information about CB/NT Sources (OU 05).

The purpose of a Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. In addition, Five-Year Review reports identify issues or deficiencies found during the review, if any, and recommendations to address them.

Brief site descriptions are summarized below.

Commencement Bay Nearshore/Tideflats Sediments (OU 01)

The CB/NT Sediments OU 01 is located in Tacoma, Washington at the southern end of the main basin of Puget Sound (Figure 4-1). The site encompasses an active commercial seaport and includes 10-12 square miles of shallow water, shoreline, and adjacent land, most of which is highly developed and industrialized. The marine and estuarine portions of the site also support important recreational and tribal fisheries. The site is located in a tribal Usual and Accustomed fishing area.

Contaminants in the CB/NT area originate from both upland and in-water sources as depicted in the Conceptual Site Model (see Figure 1-1). Early industrial surveys conducted by the Tacoma-Pierce County Health Department (TPCHD) and the Port of Tacoma indicated that there are more than 281 active industrial facilities in the CB/NT area. With industrialization, the release of hazardous substances and waste materials into the environment resulted in alterations to the chemical quality of waters and sediments in many areas of the bay. Contaminants found in the nearshore area include arsenic, lead, zinc, cadmium, copper, mercury, and various organic compounds such as polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs), and phthalates.

The cleanup goal for the Commencement Bay problem areas is reduction of contaminant concentrations in sediments to levels that will support a healthy marine environment and will protect the health of people eating seafood from the bay. The ROD designated biological test requirements and associated sediment chemical concentrations referred to as Sediment Quality Objectives (SQOs) in order to achieve this goal. SQOs for all problem chemicals were set based on an evaluation of the ecological and human health risks posed by these chemicals. The SQO for PCBs was based on the human health risk assessment. SQOs for all other chemicals were based on the ecological risk assessment, because the ecologically-based cleanup levels were determined to be also protective of human health.

The ROD selected a cleanup remedy that identified eight problem areas for sediment cleanup and allowed flexibility to utilize any one, or a combination of, five key elements in any particular area. As described in the Declaration and Section 10.2 of the ROD, these elements are: 1) site use restrictions to reduce potential human health exposure to site contamination, particularly ingestion of contaminated seafood, 2) source control to prevent recontamination of sediments and meet Applicable or Relevant and Appropriate Requirements (ARARs), 3) natural recovery for marginally contaminated sediments that are predicted to achieve acceptable sediment quality within a reasonable timeframe, 4) sediment remedial action to address sediments containing contamination that is expected to persist for unacceptable periods of time, using in-place capping, dredging/confined aquatic disposal, dredging/nearshore disposal, and dredging/upland disposal, and 5) source and sediment monitoring to characterize the effectiveness of source controls and identify if additional actions are necessary, to ensure that all necessary remedial actions have been undertaken in each problem area, and to evaluate the effectiveness of the components of the remedy (including disposal sites and habitat mitigation/restoration areas), in achieving the sediment quality objectives and in relation to habitat function.

For each CB/NT Problem Area, and the two removal actions, the summary of issues and recommendations is provided in the Five-Year Review Summary Form, and a brief summary of protectiveness statements is provided below.

For the Hylebos Waterway, the remedy is expected to be protective of human health and the environment upon completion. Most remedial action construction has been accomplished, and the additional actions needed for the remedy throughout the waterway to be protective described in the ROD and this report, are progressing towards completion.

For the Sitcum Waterway, the remedy has been successfully completed, all required long-term monitoring efforts have been completed, the remedy remains protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled.

For the St. Paul Waterway, the remedial actions have been successfully completed, all required long-term monitoring efforts have been completed, and the remedy remains protective of human health and the environment.

For the Middle Waterway, all remedial actions have been completed, the remedy is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. In order for the remedy to be protective in the long-term, the Sediment Quality Objectives need to be met according to the timeframes established in the Middle Waterway Explanation of Significant Differences (ESDs), or any exceedances need to be shown to be biologically insignificant in all enhanced natural recovery (ENR) and natural recovery areas, and ICs must be fully implemented.

For the Olympic View Resource Area, the remedy is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled.

For the Thea Foss and Wheeler-Osgood Waterways, the remedy currently protects human health and the environment because the sediment remedial action significantly reduced sediment concentrations and most of the required institutional controls are in place to protect the integrity of the sediment cap. However, in order for the remedy to be protective in the long-term, additional source control activities need to be identified and implemented to reduce the extent of recontamination in the waterway and the USCG institutional control needs to be completed to help protect the long-term integrity of the sediment cap.

Taken as a whole, the remedies for the Sediments OU are expected to be protective when completed. In the interim, until site remedial objectives are met, site use restrictions (i.e., fish and shellfish consumption advisories) shall remain in effect to limit human exposure to contaminated seafood. The absence of fish tissue contaminant data does not mean that the remedy is not protective (see p. 4-14, OSWER No. 9355.7-03B-P). Recent fish tissue data for bioaccumulative chemicals have not been collected in Commencement Bay, so it is not known whether contaminant levels in fish tissues have been reduced since the remedies have been implemented, particularly for PCBs (which have a human-health based Sediment Quality Objective). Future fish tissue sampling results will be used along with other lines of evidence to ensure that the remedies are protective in the long-term.

Commencement Bay Nearshore/Tideflats Asarco (OUs 20, 22 and 19)

The Asarco portions of the CB/NT site are located in the town of Ruston at the southern end of the main basin of Puget Sound (Figure 4-1). The Smelter Facility is located along the Commencement Bay shoreline within the municipal boundaries of Ruston and Tacoma, Washington. The upland portion of the Smelter Facility is approximately 100 acres in size, and encompasses a 67-acre former smelter and a 23-acre slag Breakwater Peninsula.

The smelter specialized in processing ores with high arsenic concentrations and recovered arsenic trioxide and metallic arsenic as byproducts. Operation of the Asarco smelter for over 95 years resulted in contamination, primarily arsenic and lead, of the smelter site, off-shore sediments and the surrounding residential area.

For the Asarco Smelter and Groundwater, remedial actions are expected to be protective of human health and the environment when the remedy is completed. In the interim, exposure pathways that could result in unacceptable risks are being prevented because the site is fenced and access to the site is controlled by cell phone operated gates, monitoring during the day, and police patrols in the evenings. Dust control and other dust suppression activities (temporary capping, spraying tackifiers) are used to ensure that site contaminants remain on site.

For the Asarco Ruston/North Tacoma Study Area, remedial actions are expected to be protective of human health and the environment when the remedy is completed. In the interim, exposure pathways on the unremediated properties are only controlled through the compliance with the education program (hand washing, wetting soil, etc).

For the Asarco Sediments, remedial actions are expected to be protective of human health and the environment when the remedy is completed. For the area of sediments offshore of the Smelter where capping has been done, the remedy is already protective of human health and the environment. For the remaining sediments offshore of the Smelter and the Yacht Basin, implementation of the remedy is expected to occur in the next two to three years using money obtained from the Asarco bankruptcy settlement.

Commencement Bay Nearshore/Tideflats Tacoma Tar Pits (OU 03)

The Tacoma Tar Pits OU is located in Tacoma, Washington, within the Tacoma Tideflats industrial area near Commencement Bay. It is situated on a peninsula of land located between the Puyallup River and the Thea Foss Waterway, approximately three-quarters of a mile north of Interstate 5 (Figure 6-1). The total area of the site encompasses approximately 52 acres, and several active facilities are currently within the site boundaries including Simon Metals (a metals recycling business), the Northwest Detention Center (NWDC; an immigration detention facility), and a capped engineered waste pile and groundwater treatment plant constructed as part of the remedial action for the site.

Results of site investigations conducted in the 1980s indicated that soil, surface water and groundwater across most of the site were contaminated with organic and inorganic contaminants from former on site coal gasification plant operations and the recycling of automobiles and

electrical transformers. The primary contaminants included metals, PAHs, PCBs, and various volatile organic compounds (VOCs) including benzene.

The remedy selected in the 1987 ROD called for excavation and stabilization of contaminated soils into an engineered waste pile covered by a low permeability cap, and surface water controls to 1) manage storm water runoff from the waste pile and metal recycling operations, and 2) limit infiltration of surface water into the subsurface. The selected Superfund remedy also called for continued groundwater monitoring across the entire site to discern whether the remedial action implemented for soils and surface water caused contaminants in groundwater to drop below the ROD cleanup criteria. If it did not do so in a timely manner, the ROD anticipated the need for a groundwater remedy to be implemented.

The soil and surface water components of the selected Superfund remedy were completed in 1995, and soil and surface water cleanup criteria have been achieved. In 1998, due to continued exceedances of the groundwater cleanup criteria, EPA directed the PRP to design and install a groundwater extraction and treatment system to treat on site groundwater, with a focus on benzene contamination, and prevent it from migrating off site and potentially impacting the Puyallup River. The groundwater extraction and treatment system became fully operational in September 2002.

Over the past year there has been a lot of community concern over recent construction activities at the NWDC facility. This facility, first constructed in late 2003, is located on the former Hygrade meat packing plant property along the northwestern boundary of the site. Investigations conducted in the 1980s on this portion of the site showed groundwater contamination but little to no soil contamination. Except for a small section at the southeast corner, the vast majority of this property did not require excavation, capping or surface water controls under the Superfund remedy. Prior to the facility being built, three areas of petroleum-contaminated soils were cleaned up under the Washington State's Voluntary Cleanup Program. Expansion of the NWDC facility was initiated in late 2008 and completed in spring of 2009.

Fortunately, based on a review of site documents and construction plans, as well as observations and interviews conducted during recent expansion activities, community concerns regarding impacts on the Superfund remedy and the potential risks to detainees and on site workers from contact with contaminated soil and groundwater were not substantiated. The initial construction and subsequent expansion of the NWDC facility did not impact the Superfund remedy. It did, however, add a potential new exposure pathway for detainees and workers within the detention facility buildings via vapor intrusion from subsurface contamination. As such, a screening evaluation was conducted by an EPA risk assessor during this Five-Year Review using soil sampling data taken from expansion excavations. Results of this screening evaluation found that unacceptable risks to detainees and on site workers from exposure to estimated indoor air concentrations from vapor intrusion is not likely.

The results of this third Five-Year Review indicate that the Tacoma Tar Pits remedy is functioning as intended and is currently protective of human health and the environment because 1) sources of contamination (e.g., waste materials and contaminated soils) have been excavated, disposed of off site or treated and contained on site, 2) low permeability caps and surface water controls have been placed across critical areas of the site, 3) institutional controls are in place,

and 4) contaminated groundwater is not used as a drinking water source and does not appear to be discharging to the Puyallup River.

In order for the remedy to remain protective over the long-term, the follow-up actions recommended in this report need to be performed which include 1) continuing maintenance of the cap, cover and ancillary surface water drainage features, 2) continuing operation and optimization of the groundwater extraction, treatment and monitoring systems to reduce the size and concentration of the benzene plume, and 3) optimizing property owner compliance with institutional control requirements.

Environmental Indicators/Site Status Indicators: In addition to the Five-Year Review protectiveness determinations, EPA has also developed other environmental and site status indicators to measure and report progress and conditions of Superfund sites. These include two Sitewide Environmental Indicators (Human Health Exposure Under Control and Groundwater Migration Under Control) and the Cross-Program Revitalization Measures, which are evaluated by Project Area and Sitewide. Based on the findings of this Five-Year Review, EPA has made updated determinations for those indicators as follows:

Human Exposure Environmental Indicator: The status of the Superfund Human Exposure Environmental Indicator for the Site remains "Not Under Control." Despite considerable remedial action within this Site, which covers approximately 12 square miles, residential yard cleanups around the former Asarco smelter complex and some sediment remedial actions are not yet complete. In addition, while fish consumption advisories issued by the local health department which limit human exposure remain in effect, they are not enforceable and there is anecdotal evidence that some people do not follow the consumption advice provided in the advisories.

Groundwater Migration Environmental Indicator: The status of the Groundwater Migration Environmental Indicator for the Site remains "Not Under Control" because contaminated groundwater continues to discharge through bottom sediments into surface water in some areas.

Cross-Program Revitalization Measure: The Site has not yet been determined to be "protective for people under current conditions" because of the need to complete ongoing remedial actions and to put additional institutional controls in place as described in this report.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Commencement Bay, Near Shore/Tide Flats (CB/NT)		
EPA ID *(from WasteLAN)*: WAD980726368		
Region: 10	**State:** WA	**City/County:** Tacoma, Pierce County
SITE STATUS		
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☒ Under Construction ☒ Operating ☒ Complete		
Multiple OUs?* ☒ YES ☐ NO	**Construction completion date:** 9/30/2015	
Has site been put into reuse? ☒ YES ☐ NO		
REVIEW STATUS		
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____		
Author name: Nancy Harney, Karen Keeley, Tamara Langton, Kira Lynch, Kevin Rochlin, Jonathan Williams		
Author title: Remedial Project Manager	**Author affiliation:** USEPA Region 10	
Review period:** December 29, 2004 to December 29, 2009		
Date(s) of site inspection: Ongoing at each waterway and/or each Operable Unit		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion		
Review number: ☐ 1 (first) ☐ 2 (second) ☒ 3 (third) ☐ Other (specify) _____		
Triggering action: ☐ Actual RA On site Construction at OU #____ ☐ Actual RA Start at OU#____ ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify) Preliminary Closeout		
Triggering action date *(from WasteLAN)*: December 29, 2004		
Due date *(five years after triggering action date)*: December 29, 2009		

* ["OU" refers to operable unit.]
**[Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, continued

Commencement Bay Nearshore/Tideflats (CB/NT) Site

CB/NT Sediments, Operable Unit 01, OU-wide

Issues:

Recent fish tissue data for bioaccumulative chemicals have not been collected in Commencement Bay. Thus, it is not known whether contaminant levels in fish tissues have been reduced since the remedies have been implemented, particularly for PCBs (which have a human-health based Sediment Quality Objective), and whether fish advisories should be continued, modified, or removed.

Recommendations and Follow-up Actions:

Develop and implement a sampling plan for collection and analysis of bay-wide fish tissue data for bioaccumulative chemicals (particularly for PCBs, which have a human-health based Sediment Quality Objective). Provide results to appropriate state and local agencies to evaluate protectiveness of health-based fish consumption advisories for Commencement Bay.

Protectiveness Statement(s):

Taken as a whole, the remedies for the Sediments OU are expected to be protective when completed. In the interim, until site remedial objectives are met, site use restrictions (i.e., fish and shellfish consumption advisories) shall remain in effect to limit human exposure to contaminated seafood. The absence of fish tissue contaminant data does not mean that the remedy is not protective (see p. 4-14, OSWER No. 9355.7-03B-P). Future fish tissue sampling results will be used along with other lines of evidence to ensure that the remedies are protective in the long-term.

CB/NT Sediments, Hylebos Waterway

Issues:

Arkema Site source control is needed to meet RA performance standards.

Recommendations and Follow-up Actions:

Perform RI/FS and RD/RA for the Arkema Site to investigate and address contamination upland and beneath the waterway.

Protectiveness Statement(s):

The remedy is expected to be protective of human health and the environment upon completion. Most remedial action construction has been accomplished, and the additional actions needed for the remedy throughout the waterway to be protective described in the ROD and this report, are progressing toward completion.

Other Comments:

Pier 23 is within the CB/NT site and the U.S. Army is conducting the sediment cleanup under Washington Department of Ecology (Ecology) review. EPA has not reviewed all of the information developed by the U.S. Army and Remedial Action has not yet begun. Thus, EPA is unable at this time to assess the protectiveness of the response actions being undertaken by the U.S. Army at Pier 23. EPA will assess the level of cleanup achieved by the U.S. Army to determine the protectiveness of Pier 23 response actions.

Five-Year Review Summary Form, continued

CB/NT Sediments, Sitcum Waterway

Issues: None.

Recommendations and Follow-up Actions: None.

Protectiveness Statement(s): The remedy at the Sitcum Waterway Problem Area is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled.

Other Comments: None.

CB/NT Sediments, St. Paul Waterway

Issues: None.

Recommendations and Follow-up Actions: None.

Protectiveness Statement(s): The remedial actions at the St. Paul Waterway Problem Area of the CB/NT Site have been successfully completed, all required long-term monitoring efforts have been completed, and the remedy remains protective of human health and the environment.

Other Comments: None.

CB/NT Sediments, Middle Waterway

Issues:

1. Possible recontamination of surface sediments due to erosion and large burrowing organisms bringing the underlying, native sediments to the surface in Area C. Drainage from the Mylet property down-cutting, such that the underlying tideflat and wood debris are exposed in Area C.

2. Ineffectiveness of grade stake survey due to stakes missing during survey monitoring in Area C.

3. SQO exceedances for mercury in Areas A and B in NR areas where SQOs are expected to be met within a ten year timeframe.

4. SQO exceedance of bis(2-ethylhexyl)phthalate, with elevated (but below SQO) concentrations of mercury and PAH found in Area C sediments near the Mylet roof drain.

5. Beached logs have been a problem primarily for the recovering pickleweed and other vegetation at the upper tidal levels at the head of the waterway due to smothering or sediment gouging.

6. Institutional controls have not been fully implemented.

7. Year 5 monitoring results from summer of 2009 have not been included in this review and need to be evaluated to further assess status of sediments in the waterway.

Recommendations and Follow-up Actions:

1. Include chemical monitoring of burrows within drainage channels or other erosion features in future monitoring events. Evaluate options to prevent further erosion.

2. Replace with periodic topographic surveys to map the long-term effects of the outfall on the tideflat and remedy performance.

3. Continue monitoring and evaluate Year 5 data to evaluate potential causes of SQO exceedances in Areas A and B.

Five-Year Review Summary Form, continued

4. Include chemical monitoring of burrows within drainage channels or other erosion features in future monitoring events. Evaluate options to prevent further erosion.

5. Develop a Memorandum of Understanding with Simpson. Also evaluate the possibility of installing a breakwater to replace the protective function if the former piling field.

6. Conduct an IC study; follow up with the USCG about status of final RNA; verify that easements have been executed and recorded with Pierce County.

7. Evaluate Year 5 data; discuss options and potential need for additional remedial action.

Protectiveness Statement(s):

The remedial action in Middle Waterway has been completed, the remedy is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. In order for the remedy to remain protective in the long-term, the Sediment Quality Objectives need to be met according to the timeframes established in the Middle Waterway ESDs, or any exceedances need to be shown to be biologically insignificant in all enhanced natural recovery (ENR) and natural recovery areas, and ICs must be fully implemented.

Other Comments: None.

CB/NT Sediments, Olympic View Resource Area

Issues: None.

Recommendations and Follow-up Actions: None.

Protectiveness Statement(s):

The remedy at the Olympic View Resource Area is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled.

Other Comments: None.

CB/NT Sediments, Thea Foss and Wheeler-Osgood Waterways

Issues:

Source control does not appear adequate to prevent recontamination.

Recommendations and Follow-up Actions:

Continue to monitor and evaluate sources of phthalates and PAHs to sediments.

Protectiveness Statement(s): The remedy at the Thea Foss and Wheeler-Osgood Waterways currently protects human health and the environment because the sediment remedial action significantly reduced sediment concentrations and most of the required institutional controls are in place to protect the integrity of the sediment cap. However, in order for the remedy to be protective in the long-term, additional source control activities need to be identified and implemented to reduce the extent of recontamination in the waterway and the USCG institutional control needs to be completed to help protect the long-term integrity of the sediment cap.

Other Comments: None.

Five-Year Review Summary Form, continued

CB/NT Asarco, Operable Units 20, 22, and 19

Issues:

Asarco Smelter

None.

Ruston/North Tacoma Study Area

1. Based on phone calls received by EPA and Ecology, there is a subset of the people in the study area who do not know anything about the site, the fact that yards in the study area may be contaminated, the yard cleanup program, and the required institutional controls.

2. The site development may bring new people as well as different land uses to the area. This could result in differing exposures than those currently accounted for in the ROD.

3. There may be recontamination of the yards that have been remediated in the Study Area.

4. Potential for properties outside the Study area to be contaminated is being addressed by Ecology.

5. Ecology has requested that EPA review the remedy to ensure that it is still protective.

Asarco Sediments

1. The habitat basin is functioning as designed even though part of the breakwater collapsed in the 2001 Nisqually earthquake. Because the "shelf" holding the breakwater is no longer there, replacement would require a significant reduction in size of the habitat basin.

Recommendations and Follow-up Actions:

Asarco Smelter

None.

Ruston/North Tacoma Study Area

1. Review the institutional controls/education component for the Ruston/North Tacoma Study Area and determine what changes are needed to ensure that people are aware of the controls and that they are carried forward.

2. Review ongoing site and area development and ensure that changes in the area do not impact remedy protectiveness.

3. Resample a subset of properties to ensure that recontamination has not occurred.

4. EPA will document the fact that Ecology will have the lead for properties outside the study area.

5. EPA has agreed to conduct a more in depth review of the remedy for the site to ensure its protectiveness. This review will be completed by July 27, 2010. The review will use the criteria in the "Comprehensive Five-Year Review Guidance (OSWER No. 9355.7-03B-P, June 2001 and also consider strategies that Ecology has developed for addressing arsenic and lead throughout the State and within the Tacoma Smelter Plume.

Asarco Sediments

1. EPA will need to determine whether the habitat basin should be repaired or left as it is.

Five-Year Review Summary Form, continued

Protectiveness Statement(s):

Asarco Smelter

Remedial actions at the Asarco Smelter are expected to be protective of human health and the environment when the remedy is completed. In the interim, exposure pathways that could result in unacceptable risks are being prevented because the site is fenced and access to the site is controlled by cell phone operated gates, monitoring during the day, and police patrols in the evenings. Dust control and other dust suppression activities (temporary capping, spraying tackifiers) are used to ensure that site contaminants remain on site.

Ruston/North Tacoma Study Area

Remedial actions for the Ruston/North Tacoma Study Area are expected to be protective of human health and the environment when the remedy is completed. In the interim, exposure pathways on the unremediated properties are only controlled through the compliance with the education program (hand washing, wetting soil, etc).

Asarco Sediments

Remedial actions for the Asarco Sediments are expected to be protective of human health and the environment when the remedy is completed. For the area of sediments offshore of the Smelter where capping has been done, the remedy is already protective of human health and the environment. For the remaining sediments offshore of the Smelter and the Yacht Basin, implementation of the remedy is expected to occur in the next two to three years using money obtained from the Asarco bankruptcy settlement.

Other Comments: None.

CB/NT Tacoma Tar Pits, Operable Unit 03

Issues:

1. A small pavement failure was observed in the asphalt road leading to the top of the capped engineered waste pile, as shown in Operable Unit 3 (OU 3) Attachment 5, photo 8. This feature represents a potential pathway for surface water erosion of the cap. (NOTE: this is a separate pavement failure than the one noted in – and repaired after – the 2003 Five-Year Review).

2. Hydraulic conductivity testing of asphalt pavement covers has not been performed in accordance with the Inspection and Maintenance Manual. This was recommended in the 2003 Five-Year Review report.

3. The TTP-3M (East Branch) Area benzene plume within the site boundary has not appreciably diminished in size or concentration over the past several years. In addition, although this plume appears to be contained especially when looking at non-detect benzene concentrations in downgradient monitoring well DOF-19, Figure 6-5 shows a sewer line trench in hydraulic connection with the benzene plume which may convey the plume away from DOF-19.

4. The TTP-18M (North Branch) Area benzene plume appears to be contained or captured as seen through decreasing benzene concentrations; however, the concentrations are well above the ROD groundwater cleanup performance criterion for benzene (53 μg/L) and are also outside the site boundary.

5. The ROD groundwater remedy and RAOs focused on treatment and containment of the contaminated plume, but do not appear to have considered groundwater restoration.

6. Property owner compliance with site institutional control requirements is not optimal.

Five-Year Review Summary Form, continued

Recommendations and Follow-up Actions:

1. Repair the pavement hole.

2. Implement asphalt pavement permeability testing or develop and conduct an alternative way of systematically assessing asphalt pavement conditions and permeability and revise the Inspection and Maintenance Manual accordingly.

3. Optimize the TTP-3M (East Branch) Area system and conduct a capture zone analysis in order to reach the ROD groundwater cleanup criterion for benzene and reduce the size of the plume. A determination is also needed on the fate and transport of the benzene plume and its hydraulic relationship to the sewer line trench along the southern boundary of the site.

4. Optimize the TTP-18M (North Branch) Area system and conduct a capture zone analysis in order to reach the ROD groundwater cleanup criterion for benzene and reduce the size of the plume. An additional monitoring well may also be needed just beyond the stagnation point of Extraction Well A to help determine effectiveness.

5. Evaluate whether groundwater restoration at this site is feasible and necessary to 1) comply with ARARs, CERCLA, and EPA's CERCLA groundwater policies, and 2) ensure long-term protectiveness.

6. Request site property owners to comply with all Consent Decree conveyance of site/institutional control requirements. Voluntary compliance with the state of Washington's Uniform Environmental Covenants Act (UECA) should also be requested to ensure the long-term effectiveness of site institutional controls.

Protectiveness Statement(s): The results of this Five-Year Review indicate that the Tacoma Tar Pits remedy is functioning as intended and is currently protective of human health and the environment because 1) sources of contamination (e.g., waste materials and contaminated soils) have been excavated, disposed of off site or treated and contained on site, 2) low permeability caps and surface water controls have been placed across critical areas of the site, 3) institutional controls are in place, and 4) contaminated groundwater is not used as a drinking water source and does not appear to be discharging to the Puyallup River. In order for the remedy to remain protective over the long-term, the follow-up actions recommended in this report need to be performed which include 1) continuing maintenance of the cap, cover and ancillary surface water drainage features, 2) continuing operation and optimization of the groundwater extraction, treatment and monitoring systems to reduce the size and concentration of the benzene plume, and 3) optimizing property owner compliance with institutional control requirements.

Other Comments: None.