Occidental Chemical Tacoma Site

Background

About Occidental

The Occidental Chemical Corporation (Occidental) site in the Tacoma Tideflats was home to chemical production, shipbuilding, and military operations. Contamination from these operations is in soil, groundwater, and sediment at and around the property.

History

Occidental Chemical Corporation used to manufacturer chlorine, bleach and other chemicals for the paper industry. Its Commencement Bay facility stopped operating in 2002. The only structure that remains on the site is the groundwater treatment plant.

The main products produced at this site (from 1929 to 2002) include:

- Chlorine and chlorinated solvents such as trichloroethylene and perchloroethylene (TCE and PCE) which were produced for refrigerants
- Caustic soda
- Ammonia
- Calcium chloride
- Muriatic acid

Timeline

Before 1920: The tidal mudflats were undeveloped. (We use the modern-day Billy Frank Jr. Nisqually National Wildlife Refuge Delta to show what the undeveloped mudflats would've looked like.)

1920–1936: The area was filled with dredge material as part of an upland expansion project.

1929–2002: Occidental and its predecessors made chemicals. Other owners and operators during this period include Hooker Chemical, the US Navy, US Defense Plant Corporation, Todd Shipyards, and Pioneer Americas.

1988–2004: EPA conducted a Resource Conservation and Recovery Act (RCRA) Facility Investigation.

2005: Ecology and EPA issued a Statement of Work for the Administrative Order on Consent. These documents guide site investigation activities.

2006–2008: Occidental demolished former manufacturing facilities—this included the demolition of the old caustic house, salt conveyer, and treatment plant.

2005–Present: Occidental conducted numerous investigations to assess impacts to onsite and offsite soil, groundwater, sediment, and soil vapor.

Contamination

Site Contamination

The groundwater, soil, and sediment from the site contains hazardous substances. The contamination is from both:

- Historical operations and waste disposal practices.

- Occidental and past owners and operators of the facility.

The primary contaminants include:

- Chlorinated volatile organic compounds (CVOCs).
- Byproducts of chlorinated solvent production including semi-volatile organic compounds (SVOCs).
- Sodium hydroxide.
- Salt (sodium chloride).

Soil Contamination

Site soil and sediments beneath the Hylebos Waterway contain CVOCs and SVOCS. There are also PCBs and metals on the property and along the Hylebos embankment.

Groundwater Contamination

The groundwater is contaminated with CVOCs, dense non-aqueous phase liquid (DNAPL) consisting of concentrated trichloroethylene and perchloroethylene (TCE and PCE), and elevated pH.

The CVOC plume extends to the north from below the site to the northern end of the peninsula and under Commencement Bay, as well as to the east below the Hylebos Waterway. It goes to about 160 feet below sea level and gets deeper as it gets further away from the site.

The pH plume is mostly below the site but does extend to the north under the peninsula and to the east under the Hylebos Waterway. The depth of the pH plume extends to 100 feet below sea level.

Because this site is so close to the Hylebos Waterway, there are unique challenges for measuring the contamination. Over the years, Occidental, Ecology, and EPA studied the groundwater to learn more about the hydrogeology of the area. Efforts over the past few years have focused on filling data gaps and supplementing Remedial Investigation data.

How big is the site?

A “site” is the extent of contamination, which is often different from a “property” line.

The image shows the approximate size of one football field. The area of the site covers approximately 90 acres or 70 football fields.

Previous Studies

Many studies were conducted by Occidental to understand the nature and extent of the contamination. This work was overseen by Ecology and EPA. In 2015, Ecology sought public comment on the draft Remedial Investigation. The investigation provided an in-depth explanation of this site’s characteristics like the geology, hydrogeology, and the nature and extent of the contamination.

After hearing from the public, we knew we had to do more studies to understand this complex cleanup site. We worked with an independent contractor, Ridolfi Environmental, to evaluate the risk assessment and exposure pathways to contamination. In 2016, Occidental and its contractors studied the sediments and porewater in the Hylebos and Inner Commencement Bay. Ecology and EPA oversaw this study. Ecology also conducted a study on the indoor air contamination and potential risks of vapor intrusion at nearby industrial properties. These studies, along with a draft Feasibility Study went out for public comment in 2017.

In 2018, Ecology studied contamination at the canoe landing site for the Puyallup Tribe of Indians Paddle Power to Puyallup. We found no contamination from the Occidental site and presented the results to the Canoe Council. We also conducted more research on the impact of natural disasters on the cleanup of this site and study the contaminant plume's stability. The results of these studies can be found in our Feasibility Study Response to Comments.

What Is The Risk of Contamination?

Risk Evaluation

Ecology hired an independent consultant to conduct a risk evaluation. The evaluation showed that the proposed cleanup actions that protect human health will also protect ecological receptors such as wildlife and resident fish that could serve as a food source to other animals.

Ecology is working with EPA on an updated Commencement Bay Study. The Hylebos is an industrial waterway with many polluted sites along its banks. Contamination in the waterway may come from many sources and not only from the Occidental Site.

See the fish consumption tab.

Fish Consumption

People who consume resident fish and shellfish from the Hylebos Waterway may have an indirect risk of exposure. Find more information about healthy fish consumption on the Washington Department of Health's website.

Shellfish harvesting is closed in Commencement Bay due to pollution. Find out more by visiting Tacoma-Pierce County Health Department's Safe Shellfish website.

Also see exposure pathways tab.

Risk to Public

Contamination from the site does not pose a risk to activities such as swimming, paddle boarding, or boating. There are no homes or public places affected by the contamination. The groundwater will never be used as drinking water.

Only authorized persons may enter the site area and neighboring properties. People onsite must follow a safety plan that limits their contact with contaminated soil, groundwater, and sediment, or breathing indoor air.

Ecology recognizes that the area is prone to tsunamis, earthquakes and volcanoes. Emergency planning is a key requirement for all industries in the Tideflats.

Exposure Pathways

Site contamination can enter the body through four main pathways:

- Breathing dust.
- Breathing vapor.
- Touching soil.
- Swallowing soil or groundwater.

Drinking Water

Contamination does not affect public drinking water. If you have a private well nearby, please contact Tacoma-Pierce County Health Department at 253-798-6470.

Cleanup

Cleanup Progress

2002–2014:

- Occidental closes their Tacoma facility.
- Occidental studies contamination with Ecology and EPA oversight.
- Occidental dredges contaminated soils out of the Hylebos and pumps and treats contaminated groundwater.
- It has been estimated that more than 100,000 pounds of solvents have been removed.

2015–2016:

- The draft Remedial Investigation (RI) is available for public comment. We hold two public meetings, meet with the Puyallup Tribe and interested parties.
- We respond to comments and conditionally approved the RI without the risk assessment.
- Occidental studies porewater and sediments in the Hylebos and Inner Commencement Bay.
- We dive deeper into potential indoor air contamination at nearby industrial properties.

2017:

- Several documents are available for public review for 120 days:
- Draft feasibility study
- Draft agreed order
- Vapor intrusion reports and memos
- Sediment and porewater studies
- We host a public meeting and public hearing. We meet with the Puyallup Tribe and interested parties.
- 140 people comment on the draft documents.

2018:

- Ecology, EPA, Occidental, and the Puyallup Tribe develop a plan to study contamination at the canoe landing site. We present the results to the Canoe Council.
- We do more research of:
- The impacts of natural disasters on the cleanup.
- Contaminant plume stability.
- Our responses to public comments is available in Fall.

2003:

Draft cleanup action plan will be available for public comment.

Who Oversees and Pays for the Cleanup?

Ecology oversees the investigation and cleanup of groundwater, surface water, and soil. EPA oversees the mouth of the Hylebos, Commencement Bay, and sediments. Together, the two agencies work on the major milestones of the cleanup process.

Occidental pays for the clean up—all of it! They also pay for Ecology's oversight work.

Key Elements of the Proposed Remedy

1. Early Action Source Treatment
    - Treat shallow soil, groundwater, and soil vapor
    - Dewaters contaminated shallow soil for treatment
    - Extracts contaminated shallow soil vapor for treatment
    - Extracts contaminated shallow groundwater for treatment
    - Reduces migration and potential release of hazardous substances (groundwater, soil, soil vapor, indoor air, and ambient air)
2. Vertical Barrier Wall
    - Contains shallow groundwater and pH plume
    - Bank stabilization
    - Improves efficiency of the groundwater extraction system
3. Cover System
    - Eliminates direct contact exposure
    - Reduces infiltration
4. Containment and Mass Reduction by Strategic Groundwater Pumping
    - Extract mass and contain plume
5. Institutional Controls
    - Limits/prohibits activities that interfere with the integrity of the remedy.
6. Long-Term Monitoring
    - Routine soil vapor and groundwater monitoring.

Where We Are Now

The draft cleanup action plan (dCAP) will be available for public review and comment this fall. The dCAP is based on the information and technical analyses from the Remedial Investigation, Feasibility Study, public comments, and community concerns.

The dCAP:

- States cleanup standards and other requirements.
- Describes our proposed cleanup alternative.
- Compares cleanup options in a revised disproportionate cost analysis.