

Proposed Cleanup Action for Burlington Environmental (PSC – Georgetown) Facility¹

Washington State Department of Ecology (Ecology) proposes a cleanup action to reduce levels of 1,4-dioxane in groundwater at the Burlington Environmental (PSC Georgetown) site. The facility property is located at 734 South Lucile Street in south Seattle (see map on page 7). The facility and site have been called “PSC Georgetown” in the past. We will use the same name in this document to be consistent with past notices and to avoid confusion.

The purpose of this fact sheet is to:

- Summarize the proposed cleanup action and related amendment of the company’s Agreed Order (AO) and 2010 Cleanup Action Plan (CAP).
- Announce a public comment period for the draft Agreed Order Amendment and Ecology’s State Environmental Policy Act (SEPA) threshold determination.
- Describe Ecology’s process for making final decisions on the cleanup action, Amended Agreed Order, and Cleanup Action Plan.

You can learn more about the site at <https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=2622>

How is the Site Contaminated?

The PSC Georgetown site (Site) contamination is present in areas east and west of 4th Avenue

¹ Burlington Environmental, LLC is a wholly-owned subsidiary of PSC Environmental Services, LLC, which is now a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc.

South. In 2010, Ecology finalized a Cleanup Action Plan and Agreed Order (#DE 7347) for the East of 4th area of the Site. These documents describe the actions the company will take to clean up contamination. Most of these actions have been designed, implemented, and completed.

The Site groundwater is contaminated with 1,4-dioxane, as well as other hazardous substances, both east and west of 4th Ave South. 1,4-dioxane is a semi-volatile chemical used to make solvents more stable. The 1,4-dioxane contamination is likely from a solvent release.

City-supplied drinking water is not affected by the groundwater contamination at the Site. Groundwater within the Site is not a drinking water source, and isn’t expected to be in the foreseeable future. The primary health concern, and the basis for its 2010 Cleanup Level, is the potential for the contaminated groundwater to reach the Lower Duwamish Waterway and contaminate the surface water environment. Fish and shellfish could then become contaminated and pass this contamination along to the people who eat them.

Why Change the Agreed Order?

In 2004, PSC installed a subsurface barrier wall around the facility property east of Denver Avenue. It prevents contaminated groundwater below the facility from moving down-gradient into areas to the west and southwest. As a result, groundwater contamination to the west and southwest has generally decreased.

When Ecology developed the CAP in 2010, we believed that concentrations of 1,4-dioxane were decreasing and would continue to naturally decrease without added cleanup measures. While 1,4-dioxane concentrations have decreased in some areas, groundwater contamination persists and reductions have been less than expected in other areas.

The 2010 CAP contains a "contingent remedy" to be implemented by PSC if 1,4-dioxane levels did not decrease to cleanup levels by 2015. The contingent remedy described in the 2010 CAP involves pumping groundwater from a single "hot spot" location, treating it with advanced oxidation methods, and then discharging the treated water to the sewer. In 2010 we believed this was the best way to address 1,4-dioxane contamination if it continued to persist in a localized area.

Today, Ecology believes the "pump and treat" contingent remedy described in the 2010 CAP is not the most cost-effective way to deal with the contamination. It is now clear that there is more than one 1,4-dioxane "hot spot" within the groundwater plume. Other sites have recently used different types of 1,4-dioxane remediation that do not require the groundwater to be pumped to the surface. One of these remedies injects oxidizing chemicals into the groundwater. The oxidant destroys the 1,4-dioxane in a defined area of contamination near the point(s) of injection. Because this type of remedy is not included in the 2010 CAP, the 2010 Agreed Order and CAP need to be amended to accurately describe the new cleanup actions Ecology will require PSC to take.

What Does Ecology Propose?

Ecology proposes to inject an oxidant (persulfate) into groundwater in two areas east of 4th Ave South. The oxidant injections will target higher 1,4-dioxane concentrations at depths of 35 to 75 feet below ground. Each area will need multiple injection points and the injections will likely be repeated. We expect the oxidant to destroy 1,4-dioxane near these injection points and result in much lower concentrations. The most westerly of these areas is a little less than 1/2 mile from the Duwamish Waterway.

PSC will create design documents (Design) before injecting the oxidants. The Design will:

- Describe "bench-scale" studies to find out how much oxidant is needed.

- Determine the buffering capacity of the subsurface.
- Determine whether "activator" chemicals should be used to help destroy contaminants.²

The Design will include plans for an initial pilot study near the intersection of South Lucile Street and Maynard Avenue South. The pilot study will help optimize injection volumes and rates, and monitor the distribution of the oxidant, its travel time, and its persistence. Based on this information, changes in the final Design may be made before the injection of oxidant into the larger targeted area along 6th Avenue South, between south Findlay and south Orcas Streets (see figure on page 8).

The Design will also include monitoring proposals for all injection phases. This monitoring information will help us determine:

- What affect the oxidant is having on groundwater contaminant levels.
- Whether repeat injections are needed.
- If there are unwanted side effects with oxidant introduction that need to be mitigated.

The oxidant injections should reduce 1,4-dioxane in areas where concentrations are especially high. However, the Cleanup Action Plan's 1,4-dioxane groundwater cleanup levels will still not be achieved in all areas of the Site by the end of 2015. Ecology does not believe there is a practical cleanup action capable of doing this.

Following the oxidant injections, 1,4-dioxane concentrations in groundwater will remain elevated in a number of locations. It could be a long time before concentrations throughout the Site reach their cleanup levels.

² Persulfate *activation* is sometimes needed to better destroy contaminants. Activation creates sulfate radicals, which are strong oxidants. The activation can be produced by adding hydrogen peroxide or reduced iron, or increasing the pH.

For that reason, the proposed cleanup action may include a second component. PSC and investigators, working with Rice University, will begin conducting a biodegradation study.

Biodegradation uses microorganisms to lower concentrations of certain chemicals "naturally." The microorganisms consume the chemicals as a food source, lowering chemical concentrations. PSC's biodegradation study will determine:

- If site groundwater contains microorganisms capable of effectively degrading 1,4-dioxane.
- If site groundwater can be effectively "augmented" by adding organisms capable of degrading 1,4-dioxane.
- What types of non-toxic "nutrients" or other enhancements can be added to site groundwater to improve the biodegradation rate of 1,4-dioxane.

Ecology will consider injecting nutrients that stimulate 1,4-dioxane bioremediation or non-native microorganisms that are better at degrading the chemical in groundwater if the study finds this to be helpful. Injections would not occur until all oxidant injections had been completed. If the study does not indicate that 1,4-dioxane bioremediation can be safely and effectively enhanced, no further actions other than continued groundwater monitoring would follow.

The oxidation and bioremediation cleanup phases are not expected to lead to worse groundwater conditions. However, we will monitor wells during both phases to measure the action's performance. The monitoring wells will also ensure that any unintended effects of the injections are either harmless or temporary and reversible. If monitoring shows a problem, it will be addressed before downgradient groundwater quality closer to the Waterway is affected.

Oxidant injections will occur just off the targeted streets (6th Ave. S. and Maynard Ave. S.) in right-of-way areas. PSC will minimize any traffic or other public inconveniences during the times when this work is being done.

What's Changing in the Agreed Order and Cleanup Action Plan?

There is no immediate threat to human health or the environment. But because 1,4-dioxane cleanup levels will not be reached by 2015, PSC is required to take additional action.

The 2010 Cleanup Action Plan contained a "contingent remedy" (pump and treat from a single location) that could potentially serve as this additional action.

Ecology is now proposing a new 1,4-dioxane cleanup action that is different than the 2010 Cleanup Action Plan's contingent remedy. To proceed with the preferred action described in the preceding section, the 2010 Agreed Order must be amended. The amendment:

- Describes the new action.
- Describes what parts of the 2010 Order and CAP are no longer in effect.
- Provides enforceable due dates for documents and actions related to implementing the new action.
- Establishes a new restoration (cleanup) time frame for reaching 1,4-dioxane cleanup standards.

Ecology's proposed action will not reduce 1,4-dioxane groundwater concentrations to cleanup levels in all site areas by 2015. The action we are proposing may not even be fully implemented in 2015.

We are therefore proposing that the Agreed Order be amended to change the 1,4-dioxane restoration time frame from 2015 to 2032. This time frame is consistent with the 2010 Cleanup Action Plan's restoration period for other groundwater contaminants in the eastern part of the Site.

We'd Like to Hear From You

Ecology welcomes your comments on the proposed cleanup action and associated amendment of the 2010 Agreed Order.

We will consider and respond to all public comments before making final decisions. Providing written comments assures their proper consideration during Ecology's decision-making process and helps the Department respond meaningfully. Effective comments let us know if we are correctly applying current laws, rules, and regulations for the pollutants affected by this action. When you comment please be specific and refer to limits, conditions, and requirements in the Order. Tell us specifically:

- If you think we correctly applied current laws, rules, and regulations on this action.
- How the Order should change to meet current laws, rules, and regulations.

The 30-day comment period on Ecology's proposed cleanup action and associated amendment of the 2010 Agreed Order runs from **June 22, 2015 through July 21, 2015**.

To participate, you may send your comments by mail or email. Comments must be postmarked or received by email or hand delivery by **July 21, 2015** to be considered.

Mail comments to:

Ed Jones
WA Department of Ecology
Hazardous Waste and Toxics Reduction
Program
Northwest Regional Office
3190 160th Avenue SE
Bellevue WA 98008-5452
Email: ejon461@ecy.wa.gov
Phone: 425-649-4449

Get Copies of the Documents

Ecology's draft Agreed Order Amendment may be downloaded from our [website](#). You can find the Amendment and other related documents by clicking the "View Electric Documents" tab on the right side of the webpage. You may also contact Ed Jones and request that the documents be mailed or emailed to you. Mr. Jones' phone number and email address are provided above.

Hardcopies of Site documents are also available at the Department of Ecology's Northwest Regional Office in Bellevue and the repositories listed below. You may make an appointment to visit our office and review these documents by contacting Ed Jones.

Other Document Repositories

ActivSpace (Maintained by PSC for PSC
Georgetown-related documents)
West Seattle
3400 Harbor Avenue SW Unit 214
Seattle Washington 98126
425-227-6149

South Park Library
8604 8th Avenue S
Seattle WA 98108
206-615-1688

Public Meeting

Ecology has not scheduled a formal public meeting to discuss the proposed 1,4-dioxane cleanup action. However, if there is significant public interest in our proposal, we will schedule such a meeting before finalizing our decisions. To request a meeting, contact Ed Jones by phone, letter, or email.

How We Make Decisions

After the close of the public comment period, Ecology will consider all public comments before issuing a final Agreed Order Amendment. Ecology will notify PSC, each person who submitted written comments, and those who requested notice of our decisions. The Order Amendment becomes effective on the date Ecology signs it. At that time, Ecology will also issue a response to comments. It will briefly describe and respond to all significant comments raised during the public comment period and be available to the public.

Using SEPA to Protect the Environment

Ecology is the lead agency for State Environmental Policy Act (SEPA) concerns related to corrective action at the PSC Georgetown facility. SEPA requires the identification and evaluation of probable environmental impacts.

Ecology has determined that this amendment of the Order and the proposed cleanup action will not significantly impact the environment (as impacts are defined in SEPA). Our written threshold determination, a Determination of Non-significance, and the SEPA checklist are available for review during the comment period at our Northwest Regional Office and our site repositories. They are also posted on our website.

Questions?

If you have any questions regarding this notice, please contact Ed Jones, 425-649-4449, or ejon461@ecy.wa.gov.

You can also contact the public involvement coordinator, Bridgette Valdez-Kogle at 360-407-7616 or brva461@ecy.wa.gov.

Glossary

Agreed Order: A legal state document signed by Ecology and one or more responsible parties ("PLPs," under state law), setting out a process, expectations, and schedule for site cleanup.

Bioremediation (or biodegradation): A form of contamination treatment that uses microorganisms to break down hazardous substances into less toxic or non-toxic substances. In situ bioremediation involves treating contamination without bringing it to the ground surface. Bioremediation can occur on its own (often referred to as "natural attenuation"). In other cases, it may only be effective if various types of nutrients are added to the groundwater.

Adding nutrients is called "biostimulation." Sometimes the particular type of microorganisms needed to break down a chemical is already present. When not present, it can sometimes be added to the groundwater. This is called "bioaugmentation."

Cleanup Action Plan: An Ecology document that selects the site's cleanup action and specifies cleanup standards and other requirements for the action.

Corrective Action: A RCRA term that means site cleanup. The term covers the entire cleanup process (investigation, assessment, remedy selection, and remedy implementation).

1,4-dioxane: An organic chemical (an ether) used commercially for a number of purposes. In the past it was used to stabilize chlorinated solvents like 1,1,1-trichloroethane. 1,4-dioxane is not the same chemical as dioxin (i.e., it is not a polychlorinated dibenzo-p dioxin).

1,4-dioxane is characterized by the U.S. Environmental Protection Agency (EPA) as "likely to be carcinogenic to humans." There are also non-cancer health effects associated with exposure to the chemical. For more information about 1,4-dioxane please see the Agency for Toxic Substances and Disease Registry's website (<http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=199>).

Facility: This term can mean different things depending on the context. In the state MTCA cleanup regulations, "facility" means the same thing as "site," the area over where contamination is found. But for companies that treat, store, or dispose of dangerous wastes, the term "facility" is also used to refer to the property where these management activities take place.

Feasibility Study: A feasibility study compares different ways to clean up a site. It includes information about how much each cleanup alternative will cost and how long it will take.

MTCA: The Model Toxics Control Act. Passed by voters in 1989 as Initiative 97, MTCA (Chapter 70.105D Revised Code of Washington (RCW)) and its implementing regulations (Chapter 173-340 Washington Administrative Code (WAC)) govern the process for cleaning up contaminated sites in Washington State. Ecology uses the MTCA regulations to cleanup contamination at RCRA facilities that treat, store, or dispose of hazardous wastes.

PLP: Under MTCA, the party responsible for the cleanup is referred to as a Potentially Liable Person (or “PLP”).

Oxidation: When oxidants are used to remediate contaminated groundwater, and those oxidants are injected below the ground surface, the cleanup action is referred to as In Situ Chemical Oxidation. There are several kinds of oxidants commonly used for this purpose, including hydrogen peroxide and potassium permanganate. Sodium persulfate, proposed for use at this site, is a strong oxidant capable of destroying a wide range of organic compounds over a wide range of subsurface conditions.

RCRA: The Resource Conservation and Recovery Act. The national RCRA regulations govern the management of hazardous wastes. In Washington State, hazardous and dangerous wastes are regulated under Chapter 173-303 WAC.



