



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

**Port of Vancouver, Cadet/Swan, NuStar,  
and Kinder Morgan Site  
Draft Agreed Order for Partial Site Cleanup  
Responsiveness Summary**

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*Ecology's response to public comment*

Facility Site ID: 1026

Cleanup Site ID: 3450

December 2020

## Document and Contact Information

This document is available on the Department of Ecology's Site webpage at:  
<https://fortress.wa.gov/ecy/gsp/sitepage.aspx?csid=3450>

For more information contact:

Toxics Cleanup Program  
Southwest Regional Office  
P.O. Box 47775  
Olympia, WA 98504-7775  
Phone: 360-407-6261

Washington State Department of Ecology — [www.ecology.wa.gov](http://www.ecology.wa.gov)

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## **Background**

The Washington Department of Ecology (Ecology) held a public comment period from August 27 to September 27, 2020, inviting comment on the draft legal agreement, Agreed Order DE 18152 (AO DE 18152), between the Port of Vancouver (POV) and Ecology. The draft AO is about cleanup of hazardous substances at and near the Cadet/Swan part of the POV, Cadet/Swan, NuStar, and Kinder Morgan Site (Site). The POV is the only potentially liable person subject to the AO DE 18152.

One comment was received during the public comment period from Clark Public Utilities (CPU, see the Public comment section below). This document provides a response to that comment.

### **Description of the Cadet/Swan part of the Site**

In 1956, the Swan Manufacturing Co. (Swan) started making electrical heaters in a building located at the corner of W 4<sup>th</sup> Plain Blvd and St Frances Lane. In 1964, they moved to 2500 W 4<sup>th</sup> Plain Blvd. In 1972, the Cadet Manufacturing Co. (Cadet) purchased Swan. Cadet continued to make heaters. The POV purchased the former Swan site in 1982. In 2006, the POV acquired the Cadet property.

Trichloroethylene (TCE) and other chlorinated solvents were used to clean metal parts at both facilities and the solvents were released to soil and groundwater. A groundwater plume of chlorinated solvents is located under the Cadet and Swan facilities. The POV is conducting cleanup at Cadet and Swan.

### **Description of the NuStar and Kinder Morgan part of the Site**

NuStar Terminals Services, Inc. (NuStar) and Kinder Morgan Bulk Terminals, LLC (KMBT) are located on the Columbia River. NuStar and KMBT are located next to each other and not far from the Swan/Cadet locations. NuStar and KMBT are tenants of the POV. NuStar handled bulk fertilizer and other bulk products. KMBT moves copper ore and other bulk products from rail cars to ships for export. Contaminants of nitrate, ammonia, copper, and other metals are found in soil and groundwater beneath these facilities. NuStar, KMBT, and the POV are conducting a supplemental remedial investigation to assess that contamination.

At the location of the former operator of the NuStar terminal, chlorinated solvents, such as the perchloroethylene (PCE) and TCE, polluted soil and groundwater. The solvents were bulk materials handled for distribution. A groundwater plume of chlorinated solvents is located under the NuStar and KMBT operational areas.

The locations of each facility are shown on Figure 1 below.

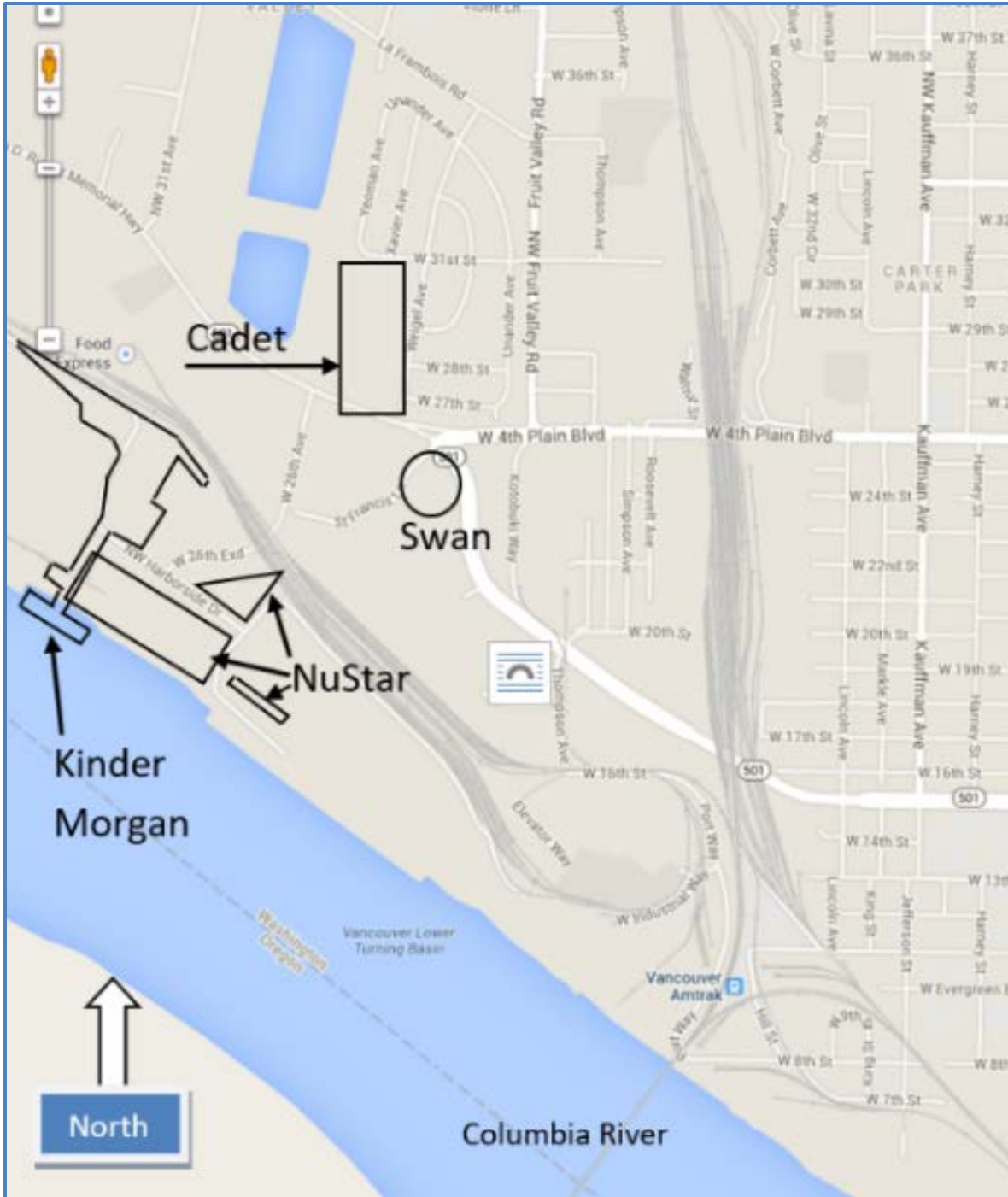


Figure 1. Street map showing the position of the Cadet/Swan, NuStar, and Kinder Morgan parts of the Site in western Vancouver.

## **Description of the Port of Vancouver Cadet/Swan, NuStar and Kinder Morgan Site**

On Figure 2 below, the former Swan location is the two small black outlined areas labelled the Former Building 2220 and the Former SMC Building. The Cadet location is the red outlined area. The NuStar location is the blue outline and the KMBT location is the orange outlined area.

In 2009, the maximum extent of the solvent plume at the Site became known and is shown by a black dashed line on Figure 2. Until recently, Ecology considered the solvent plume from Cadet/Swan and NuStar source areas to be one area-wide plume.



Figure 2. The black dashed line outlines the maximum extent of the solvent plume. The yellow shaded area is the area considered in draft AO DE 18152.



Cleanups, called interim actions (explained in the Response to public comment section below), have reduced the solvent contaminant levels so the solvent plume no longer extends all the way between the Cadet/Swan and NuStar source areas.

Contamination at the Site has not adversely affected City of Vancouver, Clark Public Utilities, or POV public drinking water supply wells. Even so, cleanup of the groundwater plume and the other contaminants is important because exposure to these substances can be harmful to human health and the environment

### **Area considered for partial cleanup of the Site**

The yellow shaded area within the Site, outlined on Figure 2, is the area considered in the draft AO DE 18152 for partial cleanup by the POV. The NuStar and KMBT area is not shaded yellow and is not included in the draft AO DE 18152.

The investigation and cleanup evaluation of the POV/NuStar/KMBT part of the Site will continue at the same time as the POV's partial cleanup. Ecology's goal is to complete a timely cleanup of the whole Site, while protecting the health of people and the environment.

## **Documents reviewed during the public comment period**

Ecology organized a comment period for public review and comment on the [Agreed Order No. DE 18152](#)<sup>1</sup> and the revised [Public Participation Plan](#)<sup>2</sup>. The AO requires the POV to complete a feasibility study and preliminary draft cleanup action plan for the area at and near the Cadet/Swan part of the Site. Ecology will prepare the draft Cleanup Action Plan.

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<sup>1</sup> <https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=93659>

<sup>2</sup> <https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=93516>

## **Public outreach and involvement**

Ecology held a 30-day public comment period from August 27, 2020, until September 27, 2020, on the Agreed Order and the revised Public Participation Plan.

To inform the public about the comment period, we mailed a [fact sheet](#)<sup>3</sup> to neighboring property owners located within approximately one quarter-mile around the Cadet/Swan part of the Site. We sent an email to our contact list for the Site, including city and county officials, departments, and utilities. We emailed an announcement about the comment period to concerned citizens and organizations who have requested to receive updates about this Site and others in Vancouver and the vicinity. We sent notices of the comment period to Tribes including the Chehalis Confederated Tribes, Confederated Tribes of the Siletz Indians, Confederated Tribes of the Grand Ronde, Confederated Tribes of the Umatilla, Confederated Tribes of Warm Springs, Cowlitz Tribe, Chinook Tribe, and the Yakama Nation.

We placed a legal ad in The Columbian Newspaper in Vancouver to notify readers about the comment period. We placed information about the comment period in Ecology's Site Register, Public Events Calendar, and on Ecology's Site webpage.

We will continue to keep the public informed during major decision points at the Site. We post electronic documents and updated information on Ecology's [Port of Vancouver, Cadet/Swan, NuStar, and Kinder Morgan webpage](#).<sup>4</sup>

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<sup>3</sup> <https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=93760>

<sup>4</sup> <https://fortress.wa.gov/ecy/gsp/sitepage.aspx?csid=3450>

## **Response to public comment**

Thank you for the comment on the Agreed Order #18152 between Ecology and the Port of Vancouver (POV).

Ecology shares the CPU concern about protection of drinking water sources from any groundwater contamination. This includes the volatile organic compound (VOC) contamination located in the alluvial aquifer units beneath the POV.

The Agreed Order deals with cleanup of contamination from prior industrial operations at the former Swan Manufacturing Company (SMC) and Cadet Manufacturing facilities. Since discovery of the VOCs in the groundwater, several cleanup efforts called interim actions have been completed, and one is ongoing to reduce contaminant levels below the ground surface.

Interim cleanup actions to reduce contaminant levels at the former SMC location include the following efforts.

- Removal of about 14,000 cubic yards of contaminated soil that was excavated to the depth of the water table.
- Injection of reagent compounds below the ground surface during seven treatment events to breakdown contamination in groundwater.
- Installation and continuous operation of a groundwater pump and treat system since 2009.

The pump and treat system pumps groundwater from an extraction well to an above-ground treatment system that removes the contamination from the groundwater. Before pump and treat operations began, the effectiveness of the system to contain and remove contamination was assessed using a groundwater model prepared jointly by the POV and CPU. Through 2019, the pump and treat system has pumped a total of 13.2 billion gallons and removed approximately 1,276 pounds of VOCs.

Interim cleanup actions to reduce contaminant levels at the Cadet facility include the following efforts.

- Installation of an extensive soil vapor extraction and air sparging system beneath the Cadet Manufacturing building. This system removed contamination from soil and groundwater.
- Installation of a recirculating-groundwater-remediation well network in the North Fruit Valley Neighborhood. This system injected compounds below the ground surface to breakdown contamination in groundwater.

These cleanup interim actions at the SMC and Cadet sites have been successful in reducing the amount of VOC contamination in soil and groundwater. Enough contamination has been removed so there is a clear separation between VOC groundwater contamination at the NuStar facility and contamination at the Swan and Cadet areas. Contaminant concentrations in Swan

and Cadet monitoring wells have decreased substantially. But some limited groundwater contamination remains at the Swan and Cadet areas. It is time to assess final cleanup options for the Swan and Cadet part of the Site.

This is why Ecology entered into an Agreed Order with the POV. The agreement requires the preparation of a feasibility study (FS) and draft Cleanup Action Plan (dCAP). The FS will evaluate cleanup alternatives. The dCAP will describe the final cleanup option and how it will be implemented. Both the FS and the dCAP will be available for public comment before the reports are finalized.

The CPU's comments request assurances related to hydraulic controls, consideration for changes in groundwater flow under future predicted pumping conditions, and contingency plans for groundwater resource protection. In accordance with MTCA requirements, the FS and dCAP will need to provide sufficient analysis to support proposed cleanup actions. A public comment period for the FS and dCAP will occur prior to Ecology approval of proposed actions.

Ecology, CPU, and the POV share the goal to protect drinking water sources. Therefore, Ecology strongly recommends that the POV and CPU meet to discuss the status of groundwater contamination and consider working together to assess current and future aquifer conditions using the groundwater model jointly developed by CPU and the POV.

## **Public comment**

Comment from Clark Public Utilities follows.



*Commissioners*

Nancy E. Barnes  
Jim Malinowski  
Jane A. Van Dyke

*Chief Executive Officer/  
General Manager*

Lena Wittler

September 26, 2020

Craig Rankine  
WA Department of Ecology  
Vancouver Field Office  
12121 NE 99<sup>th</sup> St. Suite 2100  
Vancouver, WA 98682

Subject: Draft Agreed Order 18152 for the Port of Vancouver, NuStar, Cadet Swan Site Facility Site Identification 1026

Dear Craig:

Clark Public Utilities appreciates the opportunity to provide written comments regarding the Draft Agreed Order 18152. The aquifers that underlie the Vancouver Lake lowlands are critical supply sources for meeting the drinking water needs of Clark County for the next 50+ years. The utility currently operates a public water supply well field at 5806 Fruit Valley Road drawing from the deep Sand and Gravel aquifer. The shallow Pleistocene Alluvial Aquifer, present from approximately 55 feet to 180 feet below ground surface, is the aquifer needed for meeting the long term public water needs. Efforts to protect, prevent, arrest, and address contaminated soil and ground water in the Vancouver Lake lowland area are essential in protecting this critical supply aquifer.

Attached are comments from our consultant Pacific Groundwater Group on the Draft Agreed Order 18152 for the Port of Vancouver, NuStar, Cadet Swan Site Facility Site Identification 1026. The utility is hopeful these comments will assist you continue to protect our groundwater supply. We thank you for our shared interest in providing long term protection of the aquifers present beneath the Vancouver Lake lowlands.

Thank you for your consideration of these comments.

Sincerely,

John Roth, Water Quality & Production Manager  
Clark Public Utilities – Water Services  
[jroth@clarkpud.com](mailto:jroth@clarkpud.com)  
(360) 992-8023

September 25, 2020

Craig Rankine  
WA Department of Ecology, Vancouver Field Office  
12121 NE 99th St, Suite 2100  
Vancouver, WA 98682

Re: Draft Agreed Order 18152 for the Port of Vancouver, NuStar, Cadet Swan Site  
Facility Site Identification 1026

Dear Mr. Rankine,

This letter provides comments on draft Agreed Order (AO) DE18152 for the Port of Vancouver, NuStar, Cadet Swan Site (“Site”). These comments are submitted on behalf of Clark Public Utilities (CPU), which operates municipal water-supply wells in the Site vicinity at their Carol Curtis Wellfield and (to a lesser extent) at their River Road Facility. As part of their wellhead protection responsibilities, CPU takes an active role in tracking contaminant sources within wellhead protection areas. CPU seeks to work cooperatively with Site managers and other purveyors in the Vancouver Lake Lowland that are performing overlapping wellhead protection and fate and transport evaluations. In that context, our comments relate to ensuring that analyses of contaminant fate and transport, and cleanup action developed based on the understanding of fate and transport conducted under the AO include consideration of CPU pumping from the Carol Curtis Wellfield.

Solvent releases at the Site have resulted in groundwater contamination in the Pleistocene Alluvial Aquifer (PAA). CPU secured a 20,000 acre-feet/year (af/yr) water right in the PAA at the Carol Curtis Wellfield in 2012<sup>1</sup>, but delayed initiation of pumping to provide the Port of Vancouver time to clean up the contamination by operating a pump and treat system designed to provide hydraulic control and plume containment. The pump and treat system began operation in 2009. To date, CPU’s pumping at the Carol Curtis Wellfield has been limited to production from three wells completed in the deep Sand and Gravel Aquifer (SGA). However, about ten years ago, CPU indicated that they intended to commence PAA pumping from the Carol Curtis Wellfield in 2020 (PGG, 2011). The upcoming groundwater withdrawal from the PAA differs from conditions described previously in the *Groundwater Pump and Treat Interim Action* and *Remedial Investigation* reports (Parametrix 2007; 2009; 2010). While those prior reports described no PAA pumpage from Carol Curtis, CPU intends to begin PAA withdrawals in 5,000 gallon per minute (up to 720 af/yr) increments as early as 2021, increasing to a maximum withdrawal of 25,000 gpm (Qi) and 20,000 af/yr (Qa) at full buildout.

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<sup>1</sup> Priority date April 16, 2001.



CPU seeks these assurances:

1. That hydraulic controls currently in place will remain effective as PAA pumping begins at the Carol Curtis Wellfield.
2. The feasibility study and draft and final Cleanup Action Plans (CAP) developed for the Site include consideration of the changes in groundwater flow under the predicted pumping conditions.
3. Include contingency actions that (if needed) can be implemented within a timeframe consistent with model simulations of travel times from the north side of the Site to the Carol Curtis Wellfield. should escape of HVOCs be indicated. The Port's consultant should perform model simulations to estimate this travel time.

Elements to meet these assurances are, at least in part, in place. For example, the Cadet RI (Parametrix, 2009) and its Groundwater Pump and Treat Work Plan (Parametrix 2007, 2010) include provisions to adapt hydraulic control in response to changes in the wellfield operations. Specifically, the work plan states:

**7.2.2 Flexibility to Modify Alternative to Offset Changes in Current and Proposed Wellfields in Project Area**

The proposed interim remedial action is capable of achieving the objectives outlined in Section 5. However, this interim action can be easily modified after installation in the event that the objectives are not being met. Changes that can be made to enhance the pump rate, if necessary, include:

- Increase pump rate with no change to the well. The well will have a maximum capacity of 3,900 gpm.
- Add a second well to the extraction system.

In addition, the present action can be modified, if necessary, as part of a final action. The most likely change required to achieve containment in the final action would be to increase the pump rate in response to groundwater development in the Columbia River Lowlands. This would likely require installation of a second extraction well.

CPU appreciates the continued efforts on the part of the PLPs to address the contamination in the Vancouver Lowlands. CPU looks forward to working cooperatively with Ecology, the Port and other purveyors to ensure adequate wellhead protection for the Carol Curtis Wellfield and neighboring points of withdrawal. We appreciate the opportunity to comment on the referenced Agreed Order, and will likely provide further comment as the FS and CAP process unfolds.

Sincerely,

**Pacific Groundwater Group**



Peter Schwartzman  
Principal Hydrogeologist



Glen Wallace  
Associate Hydrogeologist

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## REFERENCES

- Pacific Groundwater Group (PGG), 2011. *Comments on SMC/Cadet Interim Action Performance Evaluation Report*. Technical memorandum from Dan Matlock (PGG) to Steve Prather (CPU) dated August 29, 2011.
- Parametrix, 2007. *Groundwater Pump and Treat Interim Action SMC/Cadet Commingled Plume DRAFT Work Plan*. Prepared for the Port of Vancouver. November 19, 2007.
- Parametrix, S.S. Papadopulos & Associates, Pacific Groundwater Group and Keta Waters. 2008. *Vancouver Lake Lowlands Groundwater Model Summary Report*. Consultant's report prepared for Port of Vancouver and Clark Public Utilities dated February 2008.
- Parametrix, 2009. *Final Remedial Investigation Report Former Building 2220 Site*. Prepared for the Port of Vancouver. May 7, 2009.
- Parametrix, 2010. *Final Remedial Investigation Report Cadet Manufacturing Company Site*. Prepared for the Port of Vancouver. May 25, 2010.