

DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **BPA Tacoma Occidental Sludge Site Second Periodic Review Responsiveness Summary**

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*Ecology's response to public  
comments*

**Facility Site ID: 1262**

**Cleanup Site ID: 3911**

November 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=14722>

For more information contact:

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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 April 23 to May 24, 2020, inviting comment on the second periodic review of the BPA Tacoma Occidental Sludge Site (Site). Environmental cleanup is complete at the Site and the draft periodic review shows the cleanup work remains effective in protecting the health of people and the environment.

When some contamination remains at the site, a restrictive covenant, sometimes called an environmental covenant (EC), is filed with the county and the covenant goes with the property. When an EC exists for a cleanup site, Ecology reviews the site conditions about every five years to ensure the long-term effectiveness of the cleanup action.

The covenant was required because after cleanup, concentrations of metals (lead and arsenic) and volatile organic compounds (VOCs) remain in soil and groundwater above state cleanup levels. To prevent possible exposure to that contamination, an EC was filed for the site on January 19, 2001. Among other things, the covenant prohibits any use or activity on the property that may interfere with the integrity of the cleanup. The covenant also requires groundwater monitoring for contaminants.

## **Site description**

The BPA Tacoma Occidental Sludge Site is about 21 acres and located on the corner of Taylor Way and E West Road on the Tacoma Tideflats (see Figure 1.). The property is a right-of-way, next to the Bonneville Power Administration (BPA) Tacoma substation. The site is undeveloped land zoned M-3 for heavy industrial use.

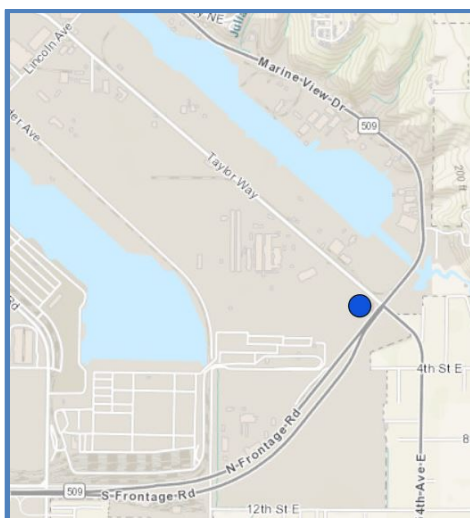


Figure 1. The blue circle indicates the location of the BPA Tacoma Occidental Sludge Site on the Tacoma Tideflats.

The area was used as a dairy farm before 1942, when the substation was constructed and put into operation. Expansion of the substation continued through 1968.

In an effort to fill low-lying areas, BPA allowed waste material to be placed on the site in the 1960s and 1970s. About 18,000 cubic yards of lime sludge from the Occidental Chemical Corporation (OCC, then Hooker Chemical Company) plant were placed on the Site. The sludge contained inorganic salts of calcium, volatile organic compounds (VOCs) and lead. In addition, about 400 cubic yards of baghouse dust and a bead-like waste product called “shot” were disposed at the Site. Among other metals, the shot contained high concentrations of arsenic and lead. The majority of the baghouse dust and shot was mixed with the nearby lime sludge on the Site.

## **Site cleanup**

Investigations from 1990 to 1992 found arsenic, lead, and volatile VOCs above cleanup levels in groundwater and soil at the Site.

In 1997, BPA and OCC entered into a consent decree (legal agreement) with Ecology to clean up the Site. The cleanup action consolidated 18,000 cubic yards of contaminated soil and sludge on-site into a containment facility. The containment is an engineered landfill with a cap over the contaminated soil (See Figure 2). The cleanup was started in April 1997 and completed in August 1998. The capped landfill prevents human exposure to contaminated material.



Figure 2. The BPA Tacoma Occidental Sludge containment facility.

From 1998 to 2019, twenty-two rounds of groundwater monitoring were tested. Results show decreasing trends in VOCs concentrations in groundwater. As the VOCs concentrations have trended downwards, there has been a reduction in the number of wells monitored and the variety of substances tested. Currently, groundwater is monitored for water quality and VOCs.

The VOCs in the groundwater that are monitored include the following chemicals.

- [Tetrachloroethylene](#)<sup>1</sup> (PCE aka PERC).
- [Trichloroethylene](#)<sup>2</sup> (TCE).
- [Cis 1,2-dichloroethene](#)<sup>3</sup> (DCE).
- [Vinyl chloride](#)<sup>4</sup> (VC).
- [Methylene chloride](#).<sup>5</sup>

The EC was required because the cleanup action left lead and arsenic concentrations above Method A and Method C cleanup levels in soil at the Site. The EC was recorded for the Site on January 19, 2001 as part of the Quit Claim Deed for the Site. The EC limits the type of land use to protect the health and the environment.

Among other restrictions, the EC:

- Prohibits activities that could result in the release of contaminants remaining on the Site.
- Only allows the land for industrial use.
- Does not allow groundwater from the Site to be used for drinking or agriculture.
- The property owner is responsible for maintaining the landfill and doing ongoing groundwater monitoring.

Ecology held a public comment period for the first periodic review in February-March, 2015. Ecology did not receive any comments.

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<sup>1</sup> <https://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=264&tid=48>

<sup>2</sup> <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=30>

<sup>3</sup> <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=82>

<sup>4</sup> <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=51>

<sup>5</sup> <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=42>

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

Ecology organized a comment period for public review and comment on the draft version of the [Second Periodic Review Report](#)<sup>6</sup>.

Ecology inspected the site on February 14, 2020. The current condition of the engineered cap and groundwater monitoring results show conditions at the site continue to eliminate possible exposure of people and the environment to contamination. Long-term groundwater monitoring continues on a regular basis.

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<sup>6</sup> <https://fortress.wa.gov/ecy/gsp/docviewer.ashx?did=96041>



## **Public outreach and involvement**

Ecology held a 30-day comment period that opened on April 23, 2020 and closed on May 24, 2020, for public comment on the draft second periodic review report.

Ecology emailed a notice to consultants handling cleanup at the Site and to people and organizations who requested to be notified about cleanup sites on the Tacoma Tideflats. Public notice about the comment period was included in Ecology's Site Register and events calendar. Ecology updated the [BPA Tacoma Occidental Sludge webpage](#)<sup>7</sup> with information about the comment period, where to submit comments, and how to download electronic documents.

Ecology will continue to keep the public informed. Electronic documents and updated information are posted to Ecology's Site webpage.

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<sup>7</sup> <https://fortress.wa.gov/ecy/gsp/sitepage.aspx?csid=3911>

## **Response to public comment**

We appreciate the time it takes people to submit comments during the comment period. We received one comment during the comment period.

The comment came from Citizens for a Healthy Bay. The comment expressed concern about whether groundwater contaminant concentrations are decreasing. The comment suggested the EC for the Site remain intact indefinitely, and not allow for any development that would disturb the landfill and the cap.

We carefully considered the comment and sought to provide a complete and comprehensive response to the concerns submitted in the comment. Our response to the comment is a letter to Citizens for a Healthy Bay. Detailed information supporting the response is included in Enclosures A to D.

The comment letter from Citizens for a Healthy Bay is Enclosure E.



Electronic Copy

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DEPARTMENT OF ECOLOGY  
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Call 711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

November 19, 2020

Erin Dilworth  
Policy & Technical Program Manager  
Citizens for a Healthy Bay  
535 Dock Street, Suite 213  
Tacoma, WA 98402  
[edilworth@healthbay.org](mailto:edilworth@healthbay.org)

**Re: BPA Tacoma Occidental Sludge Site Draft Periodic Review Report**

- **Site Name:** BPA Tacoma Occidental Sludge
- **Site Address:** Taylor Way and E West Road, Tacoma, Washington 98421
- **Facility/Site No:** 1262
- **Cleanup Site No:** 3911

Dear Erin Dilworth:

The Department of Ecology (Ecology) thanks you for your review of Draft periodic review report for the BPA Tacoma Occidental Sludge site, and providing Ecology with your comments (Enclosure-E).

Below are Ecology's responses to Citizens for a Healthy Bay's (CHB) comments:

**General Comment 1**

***In our review of the groundwater sampling report, it appears that the groundwater on site flows from the east toward the containment cell and from the west toward the cell – there does not appear to be any up-down gradient. Based on that observation, Ecology needs to provide an explanation for why Well 1-20 - which is upgradient of the contamination - has the highest concentration of contaminants.***

**Ecology Response:**

Historically the groundwater gradient at the BPA site was to the east or northeast across the site putting wells 1-20 and 7-26 in a downgradient position relative to the mound/containment unit (see Figures in Enclosure A). The November 2019 sampling round did reveal a shift in flows observed across the site (see Enclosure B) and was likely a result of heavy localized precipitation during that period. This gradient will be confirmed during the November 2020, and

future sampling events. For 1, 2-Dichloroethylene (DCE) concentrations in these wells, please see the response to comment 2 below.

### **General Comment 2**

***Further, the concentration of 1, 2-Dichloroethane (DCE) in Well 1-10 shows a somewhat downward trend. However, the concentration continues to "jump" back above 100 ppm (parts per million), indicating no real change in concentration since the year 2000.***

#### **Ecology Response:**

The well number (1-10) and the DCE concentration unit stated in your comment is incorrect; the well number in reference is 1-20 and concentration unit should be ppb [parts per billion i.e., micrograms per liter (µg/l) and not ppm (parts per million)].

There was an error in the 2019 1,2-DCE concentrations used on Figure 4.1 (well 1-20) and Figure 4.2 (well 7-26) in the *Remedial Action Operation and Maintenance and Groundwater Monitoring Annual Report – 2019*. By mistake, a DCE concentration of 110 µg/L was used in the above cited Figures instead of the actual concentrations detected in well 1-20 and 7-26 during the 2019 sampling event.

The corrected versions of Figure 4.1 and 4.2 are enclosed in Enclosure C (Figure 4.1B and 4.2B). The corrected figures present the actual concentrations of DCE detected during the November 2019 sampling event (well 1-20: 23 µg/l and well 7-26: 11 µg/l, Enclosure C: Table 3.4). These revised figures continue to demonstrate the downward trend.

The groundwater cleanup level for DCE is 70 µg/l. The groundwater monitoring results indicates that the DCE concentration has decreased from 250 µg/l to 11 µg/l (2273 percent reduction) in well 7-26 and from 110 µg/l to 23 µg/l (478 percent reduction) in well 1-20 from November 2000, to November 2019.

Also since last four years (from 2015 to 2019), there is an overall concentration reduction of 582 percent (from 64 µg/l to 11 µg/l) in well 7-26 and 352 percent (81 µg/l to 23 µg/l) in well 1-20. (except slight exceedances of DCE concentration in well 1-20 during 2015 (81 µg/l) and 2017 (80 µg/l) sampling events with overall decreasing concentration trend). The results of DCE concentrations were all below the cleanup level of 70 µg/l during all the sampling events in well 7-26.

### **General Comment 3**

***Additional work in the next five years should be done to ensure that the groundwater contaminant concentrations are actually decreasing. Currently, it appears that factors other than natural attenuation are at play, causing these fluctuations in groundwater contamination. The conclusion that the remedy is protective is correct as the site is sitting in an industrial area and no one is drinking the groundwater. However, data do not indicate that natural attenuation will bring the groundwater below standards, so Ecology***

***needs to determine and explain the field conditions that seem to be causing the decline in groundwater contaminant concentration with the use of additional wells and analytes, including those for natural attenuation.***

Ecology Response:

As discussed in responses to general comment number 2 above, the data do show an overall significant downward trend in DCE concentrations, and Ecology believes that it is likely the natural attenuation is occurring at the site. Since number of years the DCE concentrations have been below cleanup level in well 7-26, and 1-20 [except two slight exceedances in 2015 (80 µg/l) and 2017 (81 µg/l) to its cleanup level of 70 µg/l]. Currently the natural attenuation parameters are not being analyzed. However, analysis for all the appropriate natural attenuation parameters for the chlorinated solvents will be added to the future analysis. Ecology will evaluate the results of natural attenuation parameters, and contaminant concentrations during the future sampling events, and will determine whether additional wells are needed.

**General Comment 4**

***Lastly, we recommend the EC for the site, which protects the constructed landfill and cap, remain intact indefinitely. We are aware of previous proposals to relocate the nearby rail line, which would have disturbed the landfill and cap, potentially releasing contaminants into both the groundwater and nearby surface water. We are concerned that similar proposals in the future will be introduced, and ask Ecology to ensure the EC remains intact and no leniency is given for development, even on a temporary basis.***

Ecology Response:

We are not aware of any proposals to relocate the nearby rail line. The rail line is located completely outside of the containment unit perimeter/footprint (see Google Map in Enclosure D) and it is unlikely that any rail line work will impact the containment unit and/or its cap. However, Ecology will not approve/permit any activity that might potentially affect the containment unit and/or its cap. The Restrictive Covenant will be in place as long as the contaminated soils remain on the Site. Based on Ecology's understanding there are no plans to remove or alter the cap and will continue the maintenance per the O&M.

Contact Information

If you have any questions, please call me at (360) 999-9603.

Sincerely,

A handwritten signature in blue ink, appearing to read "Balaraju".

Panjini Balaraju. P.E.  
Toxics Cleanup Program  
Southwest Regional Office

Enclosures: A – Previous Groundwater Flow Direction-2015, 2016 and 2018 Sampling Events  
B – Groundwater Flow Direction-2019 Sampling Event  
C – Corrected DCE Concentration Figures  
D – Google Map-Location of Railroad Tracks in Relation to the  
Landfill/Containment Unit  
E – CHB's Comments on the Draft Periodic Review Report

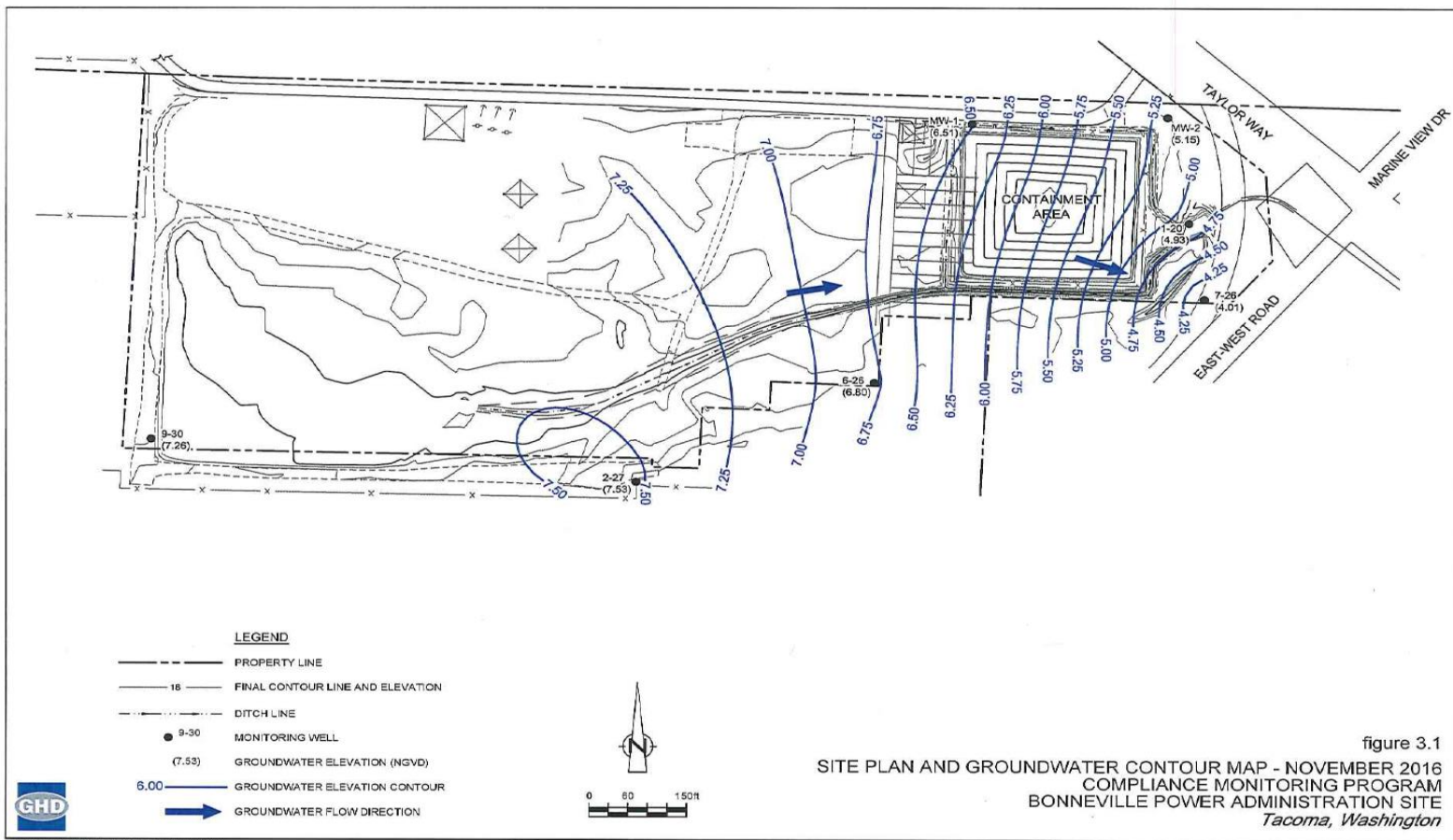
cc by email: Melissa Malott, CHB, Executive Director, [mmalott@healthybay.org](mailto:mmalott@healthybay.org)  
Ecology Site File

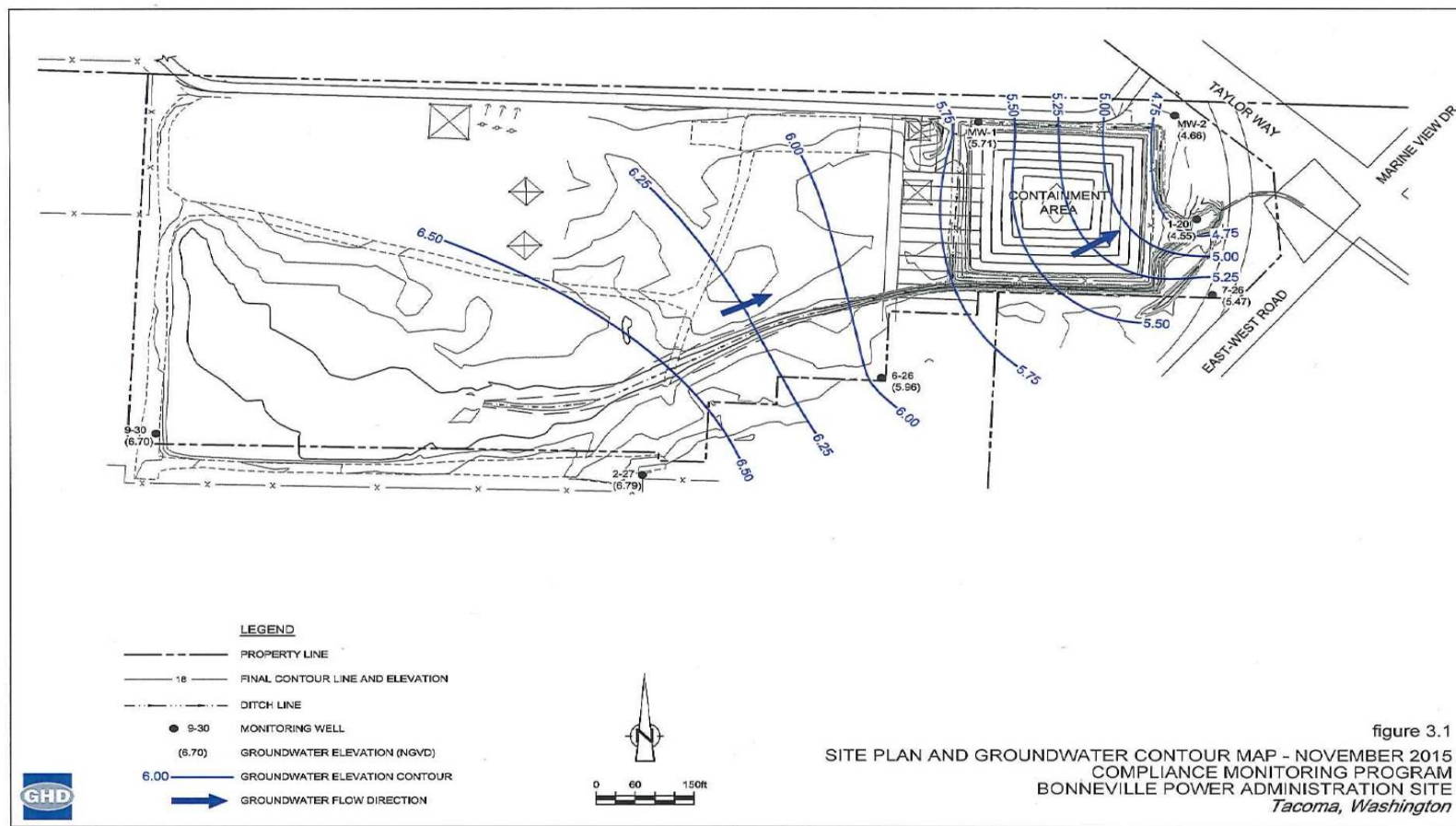
**ENCLOSURE – A**

**Previous Groundwater Flow Direction  
2015, 2016 and 2018 Sampling Events**



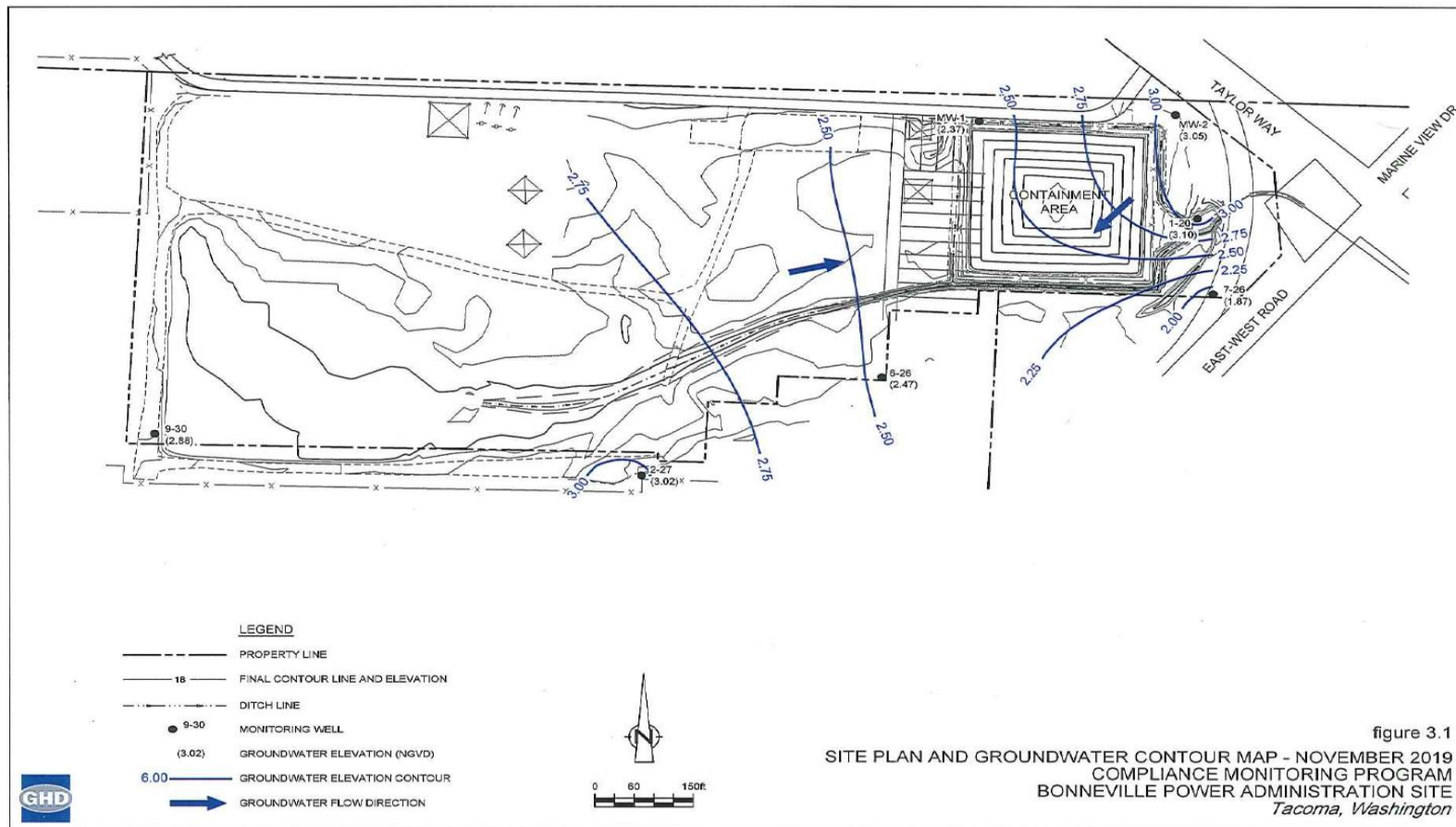






**ENCLOSURE – B**

**Groundwater Flow Direction-2019 Sampling Event**



**ENCLOSURE – C**

**Corrected DCE Concentrations Graphs and Table of Results**

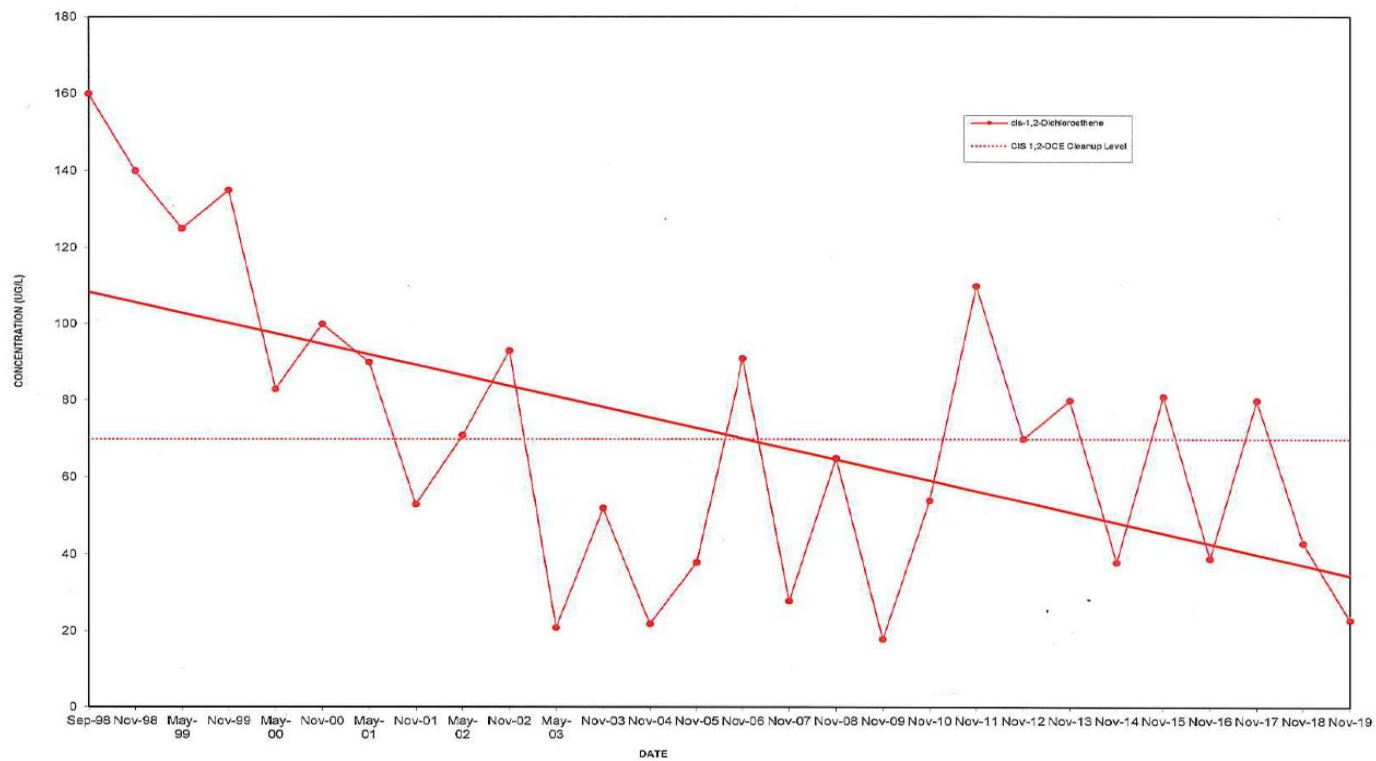


figure 4.1B

CIS 1,2-DICHLOROETHENE CONCENTRATION VS. TIME - 1-20  
 COMPLIANCE MONITORING PROGRAM  
 BONNEVILLE POWER ADMINISTRATION  
 Tacoma, Washington



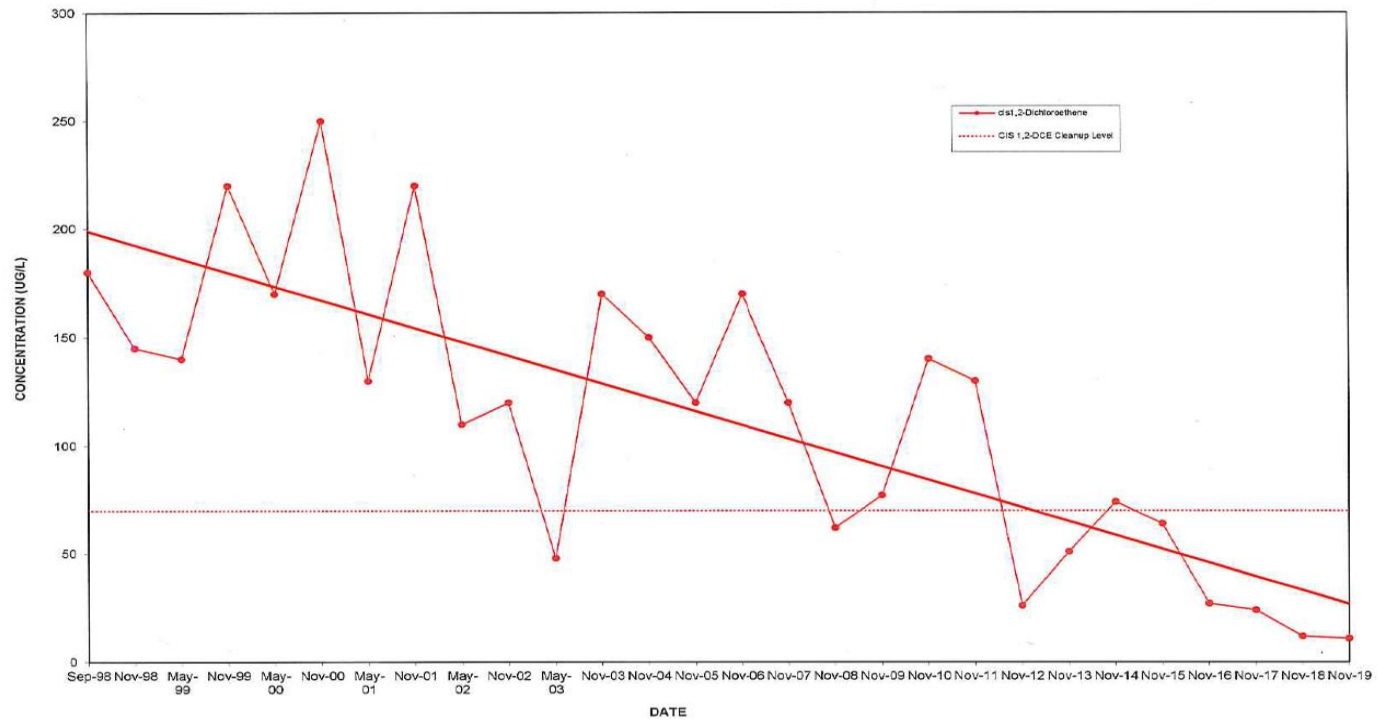


figure 4.2B

CIS 1,2-DCE CONCENTRATION VS. TIME - 7-26  
 COMPLIANCE MONITORING PROGRAM  
 BONNEVILLE POWER ADMINISTRATION  
 Tacoma, Washington



Table 3.4

Analytical Results Summary  
 Bonneville Power Administration Site  
 Taylor Way  
 Tacoma, Washington

Sample Location:		1-20	7-26	7-26
Sample ID:		GW-110618-NT-1-20	GW-110618-NT-7-26	GW-110618-NT-FD1
Sample Date:		11/6/2018	11/6/2018	11/6/2018 (Duplicate)
Parameter	Units	Cleanup Level <sup>(1)</sup>		
<i>Volatile Organic Compounds</i>				
cis-1,2-Dichloroethene	µg/L	70	43	12
Methylene chloride	µg/L	5	2.5 U	2.5 U
Tetrachloroethene	µg/L	5	2.5 U	2.5 U
Trichloroethene	µg/L	5	2.5 U	0.21J
Vinyl chloride	µg/L	10*	0.5 U	0.5 U

## Notes:

Standard, Cleanup Levels and Risk Calculations (CLARC),  
 Version 3.1, updated November 2001.

J Estimated.

U Non-detect at associated value.

\* Practical quantitation limit.

☐ Concentration exceeds the cleanup standard.



**ENCLOSURE – D**

**Google Map – Location of Railroad Tracks in Relation to the  
Landfill/Containment Unit**

Railroad tracks located east of the landfill.



**ENCLOSURE – E**

**Citizen's for the Healthy Bay Comments on  
the Draft Periodic Review Report**



Citizens for a  
Healthy  
Bay

May 21, 2020

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WA Department of Ecology  
Attn: Panjini Balaraju  
PO Box 47775  
Olympia, WA 98504-7775  
*Submitted electronically*

Re: BPA Tacoma Occidental sludge cleanup site periodic review

Dear Mr. Balaraju,

*Executive Director*  
Melissa Malott

Thank you for providing the opportunity to review and comment on the BPA Tacoma Occidental sludge cleanup site periodic review.

*Board of Directors*  
Desiree Wilkins Finch  
Barry Goldstein  
Anders Ibsen  
Jennifer Keating  
Melissa Nordquist  
Katy Stone  
Anne Taufen  
Sheri Tonn  
Alan Varsik  
Raeshawna Ware

Citizens for a Healthy Bay (CHB) is a 30-year-old organization whose mission is to represent and engage people in the cleanup, restoration, and protection of Commencement Bay, its surrounding waters and natural habitat. We are a 501(c)3 nonprofit providing practical, solutions-based environmental leadership in the Puget Sound area. We work side-by-side with residents, businesses, and government to prevent and mitigate pollution and to make our community healthier and more vibrant.

Staff and expert members of CHB's Policy and Technical Advisory Committee have reviewed the cleanup site periodic review. Our comments are outlined below.

The BPA Tacoma Occidental Sludge site was left contaminated with arsenic, lead, and volatile organic compounds (VOCs) above state cleanup levels after the BPA used waste materials from the Occidental Chemical Site (then Hooker Chemical) to fill low-lying areas on their property. Baghouse dust and shot were also disposed of at the site. While the environmental cleanup is considered complete and Ecology has determined the remedy remains effective in protecting public and environmental health, high levels of the above-mentioned contaminants are still found in the groundwater on site. To prevent exposure to contaminated groundwater, the site's Environmental Covenant (EC) prohibits any activity on the site that may undermine the integrity of the cleanup, and continued groundwater monitoring is required.

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nonprofit corporation



In our review of the groundwater sampling report, it appears that the groundwater on site flows from the east toward the containment cell and from the west toward the cell – there does not appear to be any up-down gradient. Based on that observation, Ecology needs to provide an explanation for why Well 1-20 - which is upgradient of the contamination - has the highest concentration of contaminants. Further, the concentration of 1,2-Dichloroethane (DCE) in Well 1-10 shows a somewhat downward trend. However, the concentration continues to "jump" back above 100 ppm (parts per million), indicating no real change in concentration since the year 2000. Additional work in the next five years should be done to ensure that the groundwater contaminant concentrations are actually decreasing. Currently, it appears that factors other than natural attenuation are at play, causing these fluctuations in groundwater contamination. The conclusion that the remedy is protective is correct as the site is sitting in an industrial area and no one is drinking the groundwater. However, data do not indicate that natural attenuation will bring the groundwater below standards, so Ecology needs to determine and explain the field conditions that seem to be causing the decline in groundwater contaminant concentration with the use of additional wells and analytes, including those for natural attenuation.

Lastly, we recommend the EC for the site, which protects the constructed landfill and cap, remain intact indefinitely. We are aware of previous proposals to relocate the nearby rail line, which would have disturbed the landfill and cap, potentially releasing contaminants into both the groundwater and nearby surface water. We are concerned that similar proposals in the future will be introduced, and ask Ecology to ensure the EC remains intact and no leniency is given for development, even on a temporary basis.

Thank you for providing the opportunity to review and comment on the BPA Tacoma Occidental sludge cleanup site periodic review. Should you have any questions regarding our comments, please email Erin Dilworth at [edilworth@healthybay.org](mailto:edilworth@healthybay.org).

Sincerely,



Erin Dilworth  
Policy & Technical Program Manager



Melissa Malott  
Executive Director