Electronic Copy

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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December 15, 2020

Clint Babcock
Glenn Springs Holdings, Inc.
A Subsidiary of Occidental Petroleum Corporation
605 Alexander Avenue
Tacoma, WA 98421
Clint_Babcock@oxy.com

Re: Notice of Periodic Review Conducted at the following Hazardous Waste Site:

- **Site Name:** BPA Tacoma Occidental Sludge
- **Site Address:** Taylor Way & E West Road, Tacoma, Washington 98421
- **Facility/Site ID:** 1262
- **Cleanup Site ID**: 3911

Dear Clint Babcock:

Under the Model Toxics Control Act (MTCA), chapter 70.105D RCW, which governs the cleanup of hazardous waste sites in Washington State, the Department of Ecology (Ecology) must conduct a periodic review of all sites with institutional controls and Environmental Covenants every five years. This letter serves to inform you that a second periodic review has been conducted at the BPA Tacoma Occidental Sludge Site.

The periodic review process includes the following steps:

- Confirmation that the Environmental Covenant is still active and recorded with the Title to the property.
- A review of any monitoring data collected since the cleanup was completed or since the last review was conducted.
- A Site visit to confirm the institutional controls and conditions of the Environmental Covenant are being followed.
- A 30-day public comment period on the draft periodic review report.

Based on the information collected during this periodic review, the BPA Tacoma Occidental Sludge Site meets the requirements of chapter 173-340 WAC, and the selected remedy continues to be protective of human health and the environment.

The 30-day public comment period on the draft periodic review report was ended on May 24, 2020. We received public comments from the Citizen's for the Healthy Bay (CHB) on the draft periodic review report. Enclosed are copies of Ecology's Responses to CHB's comments and a final periodic review report for your information and files.

A periodic review will continue to be required every five years as long as institutional controls and/or an environmental covenant are required to protect human health and the environment. The next periodic review will be due in May 2025.

If you have any questions regarding this letter or if you would like additional information regarding the cleanup of hazardous waste sites, please call me at (360) 407-6335. Thank you for your cooperation.

Sincerely,

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

Enclosures: A – Second Periodic Review Report
B – Ecology Responses to CHB's comments

cc by email: Rick Bieber, Geosyntech Consultants, RBieber@Geosyntech.com
Ecology Site File

Enclosure A

Second Periodic Review Report

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SECOND PERIODIC REVIEW REPORT
FINAL

BPA TACOMA OCCIDENTAL SLUDGE
Facility Site ID#: 1262
Cleanup Site ID#: 3911

Taylor Way & East-West Road
Tacoma, WA 98421-3505

Southwest Regional Office
TOXICS CLEANUP PROGRAM

May 2020

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Table of Contents

1.0 INTRODUCTION

This document is a review by the Washington State Department of Ecology (Ecology) of post-cleanup conditions and monitoring data to ensure that human health and the environment are being protected at the BPA Tacoma Occidental Sludge site (Site). Cleanup at this Site was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC).

Cleanup activities at this Site were completed under the Consent Decree Number 97 2 06046 5 dated March 3, 1997. The cleanup actions resulted in concentrations of arsenic and lead in soil and cis-1,2-dichloroethene (DCE) and vinyl chloride (VC) in groundwater that exceeds MTCA Method C and Method B cleanup levels respectively. The MTCA Method C cleanup levels for soil are established under WAC 173-340-745(2). The Method B cleanup levels were established under WAC 173-340-720(4). WAC 173-340-420 (2) requires that Ecology conduct a periodic review of a site every five years under the following conditions:

- Whenever the department conducts a cleanup action.
- Whenever the department approves a cleanup action under an order, agreed order or consent decree.
- Or, as resources permit, whenever the department issues a no further action (NFA) opinion.
- And one of the following conditions exists:
    (a) Institutional controls or financial assurance are required as part of the cleanup.
    (b) Where the cleanup level is based on a practical quantitation limit.
    (c) Where, in the department's judgment, modifications to the default equations or assumptions using site-specific information would significantly increase the concentration of hazardous substances remaining at the site after cleanup or the uncertainty in the ecological evaluation or the reliability of the cleanup action is such that additional review is necessary to assure long-term protection of human health and the environment.

When evaluating whether human health and the environment are being protected, the factors the department shall consider include [WAC 173-340-420(4)]:

(a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the Site.
(b) New scientific information for individual hazardous substances of mixtures present at the Site.
(c) New applicable state and federal laws for hazardous substances present at the Site.
(d) Current and projected Site use.
(e) Availability and practicability of higher preference technologies.
(f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

The department shall publish a notice of all periodic reviews in the Site Register and provide an opportunity for public comment.

2.0 SUMMARY OF SITE CONDITIONS

2.1 Site History

The BPA Tacoma Occidental Sludge Site is located at the corner of Taylor Way and East-West Road (current Highway 509) in the tide flats area of Tacoma, Washington. The Property consists of approximately 21 acres of the Bonneville Power Administration (BPA) Tacoma-Covington right-of-way adjacent to the BPA Tacoma Substation. The Site includes a never-occupied City of Tacoma (City) right-of-way, which runs through the property. The property is undeveloped land which is zoned M-3 heavy industrial. A Site Vicinity Map and a Site Plans are available as Appendix 6.1 and Appendix 6.2, respectively.

The BPA Tacoma Substation was constructed and first operated in 1942 and was expanded through 1968. The area was used as a dairy farm before the BPA Substation was constructed.

In an effort to fill low lying areas of the property adjacent to the Substation, BPA allowed fill material to be placed on the Site in the late 1960's and 1970's. During this time, approximately 18,000 cubic yards of lime sludge from the Occidental Chemicals Corporation (OCC, then Hooker Chemical Company) manufacturing facility were placed on the Site.

It is believed that the lime sludge originated from settling ponds at the OCC. These ponds were used to settle brine sludge generated from the manufacturing process and wastes from the manufacture of solvents. The ponds were periodically drained and scraped and the sludge was disposed of off-site. The sludge contained the inorganic salts of calcium (hydroxide and chloride) with fractional percentages of asbestos, chlorinated volatile organic compounds (VOCs), and lead. The lime sludge was placed in a low-lying area along the southern edge of the BPA Site extending almost the entire length of the site in an east-west direction.

In addition to the lime sludge placed on the Site, approximately 400 cubic yards of baghouse dust and a bead-like waste product called "shot" were disposed of on the Site. This material was deposited near the southeastern edge of the Site and contained high concentrations of arsenic and lead, as well as other metals. The majority of this waste was not mixed with the nearby lime waste.

Surface water occurs on-Site as a result of direct precipitation. A swale extending the length of the Site from east to west is the predominant drainage feature on-site. The swale discharges via a culvert under the East-West Road (Highway 509) to the Fife ditch. It is unlikely that a large quantity of water actually leaves the Site via this swale because it is clogged with vegetation and debris.

The shallow geology at the Site consists of four units: Upper sand, Upper Silt, Lower Sand and Lower Silt. The Upper Sand consists of fill derived primarily from dredged material that was placed on top of the native tidal flats. This unit varies in thickness from 1 to 5 feet on the Site. The Upper silt unit is approximately 10 feet thick in the Site and represents the native tidal flat material and acts as an aquitard limiting the water movement from the Upper Sand to the lower sand. The thickness of the lower sand unit ranges from 5 to 13 feet with silty sand to a cleaner medium fine-to-medium sand. The lower sand unit consists of gray silt with trace of organic matter. The thickness and continuity of this unit on-Site are unknown.

The groundwater occurs at or near the ground surface during the wet season and 6 to 8 feet below ground surface (bgs) during the dry season. Thus, groundwater is only seasonally present in the upper sand. When it is present, it flows primarily laterally to the swale that drains to the east toward the Fife ditch. In the lower sand, the groundwater generally flows to the east toward the Fife Ditch.

2.2 Cleanup Levels

The Site is zoned as M-3 for heavy industrial use in the tide flats area of Tacoma. MTCA Method C and Method B cleanup levels were determined to be appropriate for soil and groundwater respectively at this Site. The soil and groundwater cleanup levels are presented in Table 1 and Table 2 below.

Table 1: Soil Cleanup Levels

CONTAMINANT	CLEANUP LEVEL (mg/kg[1])
Tetrachloroethene	0.5
Trichloroethene	0.5
Dichloromethane	0.5
Hexachlorobenzene	0.00005
Hexachlorobutadiene	0.06
Cis-1,2-dichloroethene	7
Vinyl Chloride	0.002
Arsenic	188
Lead	1000

[1]mg/kg: milligrams per kilogram

Table 2: Groundwater Cleanup Levels

CONTAMINANT	CLEANUP LEVEL (µg/l[2])
Tetrachloroethene	5
Trichloroethene	5
Dichloromethane	5
Cis-1,2-dichloroethene	70
Vinyl Chloride	0.02
Arsenic	0.05
Lead	5

[2]µg/l: micrograms per liter

2.3 Site Investigations and Feasibility Study

2.3.1 1984 Site Investigation

In 1984, five soil samples were collected from the identified sludge disposal area at the west end of the Site. These samples were collected from depths of 8 to 12 inches below the ground surface. These samples were analyzed for chloroform, trichloroethylene (TCE), and

tetrachloroethylene (PCE), compounds known to be present in OCC lime sludge. The analyses of these soil samples did not indicate the presence of the above chemicals, at a detection limit of 0.40 mg/Kg. It was, therefore, concluded that the analyses did not confirm the report of past disposal of OCC like sludge at the Site and no further work was deemed necessary at that time. The soil sampling locations and results are presented in Appendix 6.3.

2.3.2 1990 and 1991 Site Investigations

As a result of the detection of compounds associated with the OCC lime sludge in groundwater and a soil sample(s) collected at the adjacent Port-of-Tacoma East-West Road property, the OCC conducted additional investigations on the BPA Property in October 1990 and early 1991:

- To further characterize the materials at the Site.
- To determine whether OCC lime sludge was disposed of at the Site.
- If such sludge was disposed of at the Site, to determine what additional actions are required, if any.

As a part of above investigations, 31 test pits were excavated and eight boreholes were installed to delineate the limits of sludge waste/top fill and to collect soil and/or sludge samples. Four shallow and two deep groundwater monitoring wells (MWs) were also installed for the groundwater investigation. Also surface water samples were collected. Some of the initial test pit and MWs, and surface water sampling locations are included in Appendix 6.3.

The vertical and horizontal delineation of the top fill/waste limits was accomplished by the excavation of 31 test pits and drilling of eight boreholes. The test pits and the boreholes logs showed that the top fill materials encountered included gray waste material (sludge), log yard wastes (logs, wood fragments, bark), and fill soils, mainly sand. The thickness of the fill material ranged from 0.5 to 6 feet.

During this investigation, six sludge, six groundwater, and two surface water samples were collected for the analysis of Site Specific Parameters (SSP: pH, PCE, TCE, vinyl chloride (VC), chloroform, hexachlorobutadiene, and hexachlorobenzene), and/or cis- and trans-1,2-dichloroethene (cis-and trans-DCE).

In February 1991, the Port of Tacoma (Port) conducted a site investigation along the East-West boundary located between East-West Road and the southern end eastern edges of the BPA site.

This investigation included the installation of five downgradient groundwater monitoring wells and the excavation of four test pits. Results of groundwater samples showed significant concentrations of volatile organic compounds (VOCs) attributable to the BPA Site.

In October 1991, the Port also conducted an investigation on the Taylor Way property that is located cross-gradient to the BPA Tacoma Sludge Site at the intersection of Taylor Way and East-West Road in Tacoma. The investigation included installation and sampling of monitoring wells and examination of test pits. Results of groundwater samples showed no impacts.

In 1992, the Department of Ecology sampled the baghouse dust/shot material on the eastern edge of the Site. Samples contained concentrations of arsenic and lead up to 7,410 milligrams

per kilogram (mg/kg) and 16,000 mg/kg, respectively. A sample collected from sediments in the drainage swale adjacent to the baghouse dust/shot material contained 2,500 mg/Kg of arsenic.

2.3.3 Preliminary Evaluation of Remedial Alternatives

In 1993, the OCC hired Conestoga-Rovers & Associates (CRA) for conducting a preliminary evaluation of remedial alternatives to determine the types of cleanup options available for the site. The study estimated the total volume of sludge at the Site to be 18,000 cubic yards, with 14,200 cubic yards of that amount to be covered with other fill (buried) and the remaining 3,800 cubic yards exposed. The report described the characteristics of the exposed and buried portions of the sludge. The exposed sludge contained tetrachloroethylene (PCE) near the detection limit of 0.01 mg/kg; no VOCs at a detection limit of 0.01 mg/kg; a pH of 9 to 12; and 2 to 15 percent asbestos. The buried sludge contained detectable levels of numerous chlorinated solvent VOCs and a pH of 12.

2.3.4 Final Remedial Investigation / Feasibility Study and Remedial Action

From 1994 – 1996, BPA and OCC contracted with CH2M Hill to complete additional investigations and compile all the existing information for the Site into a Remedial Investigation/Feasibility Study (RI/FS). The Site investigations conducted under this study included additional lime sludge, shot and soil sampling in five test pits from across the sludge fill area and two trenches in the area of buried sludge at the eastern end of the Site. Investigation also included additional sampling of drainage sediments and the installation and sampling of three down-gradient monitoring wells along the southern and eastern edges of the Site.

The maximum concentrations of VOCs and metals detected during all of the above investigations in different media associated with the BPA Site are presented in Table 3(a and b) below.

Table 3a: Maximum Concentrations of VOCs

CONTAMINANT	SLUDGE (mg/kg[1]) (buried)	SLUDGE (mg/kg[1]) (exposed)	SURFACE WATER (µg/l[2])	GROUNDWATER (µg/l[2])
Vinyl Chloride	0.015	ND	ND	190
Trichloroethylene	7.1	ND	ND	58
Tetrachloroethylene	57	0.029	11	ND
Hexachlorobutadiene	8.8	ND	ND	ND
Methylene Chloride	0.22	ND	ND	ND
Hexachlorobenzene	1.6	ND	ND	ND
Cis-1,2-dichloroethene	0.6	ND	ND	1800

Note: ND = not detected

[1]mg/kg: milligrams per kilogram

[2]µg/l: micrograms per liter

Table 3b: Maximum Concentrations of Metals

CONTAMINANT	DRAINAGE SEDIMENT (mg/kg[1])	DUST/SHOT (mg/kg[1])	SLUDGE (mg/kg[1])	GROUNDWATER (µg/l[2])
Arsenic	2,550	10,300	20.6	16.3
Lead	184	16,000	484	5.5

[1]mg/kg: milligrams per kilogram
[2]µg/l: micrograms per liter

The feasibility study (FS) portion of the document examined the technologies potentially available for remediation of the Site. Applicable technologies were formulated into the following three remedial alternatives:

Alternative 1: Consolidation and capping/off-site disposal / Natural attenuation

Alternative 2: Consolidation and capping / Natural attenuation

Alternative 3: Complete Removal and off-site disposal Natural attenuation.

After a detailed evaluation, Alternative 2 was selected as the appropriate remedy for the Site. The Site remedy consisted of:

- Excavation of impacted fill materials, Sludge's, baghouse dust/shot and drainage sediments from across the Site.
- Placement of the excavated materials in an on-Site engineered landfill (containment facility).
- Regularly scheduled inspection and maintenance of the on-Site landfill and associated perimeter drainage swales, Site security features and long-term groundwater monitoring.

In March 1997, OCC and BPA entered into a Consent Decree Number 97 2 06046 5 with the Washington State Department of Ecology (Ecology) to implement the selected remedy. The remedy was implemented during April 1997 through July 1998 and the remedial action was considered complete on August 24, 1998. The location of on-Site engineered landfill and a cross-section of the cap are presented in Appendix 6.4.

2.3.5 Conformational Groundwater Monitoring

The compliance groundwater monitoring (CGWM) started in September 1998 at the completion of the remedial action (RA). A total of twenty two (22) groundwater monitoring events has been conducted between September 1998 and January 2019. The CGWM was conducted on a semiannual basis until September 2003. In November 2003, Ecology approved a reduction in monitoring points (from 7 to 2) and monitoring frequency from semiannual to annual. Ecology also approved modifications to the analyte list for compliance monitoring in March 1999 and November 2003. Currently the CGWM include the hydraulic (water level measurements) and water quality monitoring. Site-wide hydraulic monitoring is performed in seven wells and water

quality monitoring in two down-gradient wells. The groundwater samples are being analyzed for PCE, TCE, DCE, VC and methylene chloride.

Results of the last five years of annual groundwater monitoring data indicates a decreasing trend in cis 1,2-DCE and VC concentrations in monitoring well 1-20 and 7-26 except the VC concentrations during the latest sampling event. Results of the latest groundwater sampling conducted in December 2019 showed VC concentrations of 4.9 µg/l and 2.3 µg/l in wells 7-26 and 1-20, respectively exceeding its cleanup/practical quantitation limit (PQL) of 0.2 µg/l. The results of 1,2-DCE concentration was below the Site cleanup level of 70 µg/l. The fluctuations observed overtime in concentrations of cis 1,2-DCE and VC at wells 1-20 and 7-26 do not suggest a systematic increase in concentrations. Nonetheless, the comparison of compliance monitoring analytical data to the cleanup standards shows overall decreasing trends over the entire monitoring period of 22 years. The monitoring well locations, groundwater flow direction (November 2019 sampling event), concentration trends and the groundwater results are included in Appendix 6.5.

2.4 Restrictive Covenant

The required RC (now referred to as an environmental covenant) was recorded as a part of the Quit Claim Deed for the Site on January 19, 2001, and the implementation of the Remedial Action (RA) was considered completed on August 24, 1998. The Covenant was required because the RA resulted in residual concentrations of arsenic and lead concentrations exceeding MTCA Method A and C cleanup levels in soils at the Site. The Environmental Covenant (EC) imposes the following limitations:

Section 1: The Site may be used only for Industrial uses as defined in and allowed under the City of Tacoma's Zoning Regulations codified in the Tacoma City Codes as of the date of this EC.

Section 2: Any activity on the Site is prohibited that may interfere with or reduce the effectiveness of the Cleanup Action, operation and maintenance, monitoring, or other activity required by the Decree. Any activity on the Site that may result in the release of hazardous substance that was contained as a part of the Cleanup Action is prohibited.

Section 3: The owner of the Site must give written notice to the Department of Ecology (Ecology), or to a successor agency, of the Owner's intent to convey any interest in the Site. No conveyance of title, easement, lease, or other interest in the Site shall be consummated by the Owner without adequate and complete provision for the continued operation, maintenance and monitoring of the Cleanup Action.

Section 4: The Owner must notify and obtain approval from Ecology, or to a successor agency, prior to any use of the Site that may be inconsistent with the terms of this EC. Ecology, or its successor agency, may approve such a use only after public notice and comments.

Section 5: The Owner shall allow authorized representatives of Ecology, or of a successor agency, the right to enter the Site at reasonable times for the purpose of evaluating compliance with the Cleanup Action Plan and the Order, to take samples, to inspect Cleanup Actions conducted at the Site, and inspect records that are related to the Cleanup Action.

Section 6: The Owner of the Site and owner's assigns and successors in interest reserves the right under WAC 173-340-430 and WAC 173-340-440 to record an instrument which provides that this EC shall no longer limit use of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of Ecology, or of the successor agency. Ecology or a successor agency may consent to the recording of such an instrument only after public notice and comment.

The Quit Claim Deed and EC are available in Appendix 6.6.

3.0 PERIODIC REVIEW

3.1 Effectiveness of Completed Cleanup Actions

Based upon the Site visit conducted on February 14, 2020, landfill cap at the Site continues to eliminate direct exposure pathways (ingestion, contact) to contaminated sludge, sediment, asbestos contained in sludge, and metals contaminated soils. No surface cracking or failure of the cap was observed, integrity of the landfill has been maintained and cap was in satisfactory condition and no repair, maintenance or contingency actions are required at this time. A photo log is available in Appendix 6.7.

A total of approximately 18,000 cubic yards of contaminated soils, sludge were excavated as part of the remedial action and these materials were consolidated within an on-Site engineered landfill (containment facility). The landfill was capped with a composite cap (Resource Conservation Recovery Act cap) and the contaminated material contained beneath the cap, which continues to eliminate the direct contact exposure pathway to the humans. Site personnel regularly perform wellhead maintenance, vegetation control in the cap surface, fence maintenance and Site security control. Landfill/Containment Facility Layout and Cap Cross-Section are available in Appendix 6.4.

Though there was fluctuations in cis-1,2-DCE and VC concentrations, comparison of compliance monitoring analytical data to the cleanup standards shows overall decreasing trends over the entire monitoring period of 22 years indicating that the contaminated materials within the landfill do not pose a threat to groundwater.

An EC was recorded for the Site and remains active. This EC prohibits activities that will result in the release of contaminants contained as part of the cleanup without Ecology's approval and prohibits any use of the property that is inconsistent with the Covenant or that will allow the release of contaminants remaining in the contaminated materials at the Site to the environment. The Covenant also restricts the Site for Industrial uses only, requires fencing to restrict public access to the Site, regular operation and maintenance of the landfill, landfill cap and groundwater monitoring. The EC serves to assure the long-term property use and integrity of the landfill cap.

3.2 New Scientific Information for Individual Hazardous Substances for Mixtures Present at the Site

There is no new relevant scientific information for hazardous substances remaining at the Site.

3.3 New Applicable State and Federal Laws for Hazardous Substances Present at the Site

MTCA cleanup levels for contaminants of concern at the Site have not changed since the NFA determination was issued on March 18, 2009.

3.4 Current and Projected Site Use

The Site is currently occupied by a commercial building, State Highway 19, and Irondale Road easement areas. This use is not likely to have a negative impact on the risk posed by hazardous substances contained at the Site. There are no changes projected in the Site use.

3.5 Availability and Practicability of Higher Preference Technologies

The remedy implemented included excavation and disposal of majority of contaminated soils and containment of remaining soils/hazardous substances. The implemented remedy continues to be protective of human health and the environment. While higher preference cleanup technologies may be available, they are still not practicable at this Site.

3.6 Availability of Improved Analytical Techniques to Evaluate Compliance with Cleanup Levels

The analytical methods used at the time of the remedial actions were capable of detection below Site cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

4.0 CONCLUSIONS

- The cleanup actions completed at the Site appears to be protective of human health and the environment.
- Soil cleanup levels have not been met at the Site; however, under WAC 173-340-740(6)(d), the cleanup action could comply with cleanup standards if the long-term integrity of the containment system was ensured and the requirements for containment technologies in WAC 173-340-360(8) have been met.
- The results of latest groundwater monitoring showed that cis-1,2 DCE concentrations were below the MTCA cleanup level and VC was not detected above its PQL. The comparison of compliance monitoring results to the cleanup standards showed overall decreasing trends over the entire monitoring period of 21 years indicating that the contaminated materials contained within the landfill are not impacting the groundwater and may not pose a threat to groundwater.
- The EC for the property is in place and will be effective in protecting public health from exposure to hazardous substances and protecting the integrity of the cleanup action.

Based on this review, Ecology has determined that the remedial actions conducted at the Site continue to be protective of human health and the environment. The requirements of the EC are being satisfactorily followed and no additional remedial actions are required at this time. It is the property owner's responsibility to continue to inspect the Site to assure that the integrity of the surface cover is maintained.

4.1 Next Review

The next review for the Site will be scheduled five years from the date of this periodic review. In the event that additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years from the completion of those activities.

5.0 REFERENCES

GHD, Annual Report 2018. Remedial Action Operation and Maintenance and Groundwater Monitoring. Bonneville Power Administration Site, Tacoma, Washington.

GHD, Annual Report 2017. Remedial Action Operation and Maintenance and Groundwater Monitoring. Bonneville Power Administration Site, Tacoma, Washington.

GHD, Annual Report 2016. Remedial Action Operation and Maintenance and Groundwater Monitoring. Bonneville Power Administration Site, Tacoma, Washington.

GHD, Annual Report 2015. Remedial Action Operation and Maintenance and Groundwater Monitoring. Bonneville Power Administration Site, Tacoma, Washington.

CH2M Hill, 1993. Off-site Migration Pathway Assessment, BPA Tacoma Substation. Prepared for Bonneville Power Administration.

CH2M Hill, 1996. BPA/Oxychem Site, Remedial Investigation and Feasibility Study Report. Prepared for Bonneville Power Administration and Occidental Chemical Corporation.

Conestoga-Rovers and Associates (CRA), 1991. Site Investigation, Bonneville Power Authority Property, Taylor Way, Tacoma, Washington. Prepared for Occidental Chemical Corporation.

Conestoga-Rovers and Associates (CRA), 1993. Preliminary Evaluation of Remedial Alternatives. Bonneville Power Administration Property, Taylor Way, Tacoma, Washington. Prepared for Occidental Chemical Corporation.

Hart Crowser, 1991a. Final Investigation Report, East-West Road Property, Tacoma, Washington. Prepared for the Port of Tacoma.

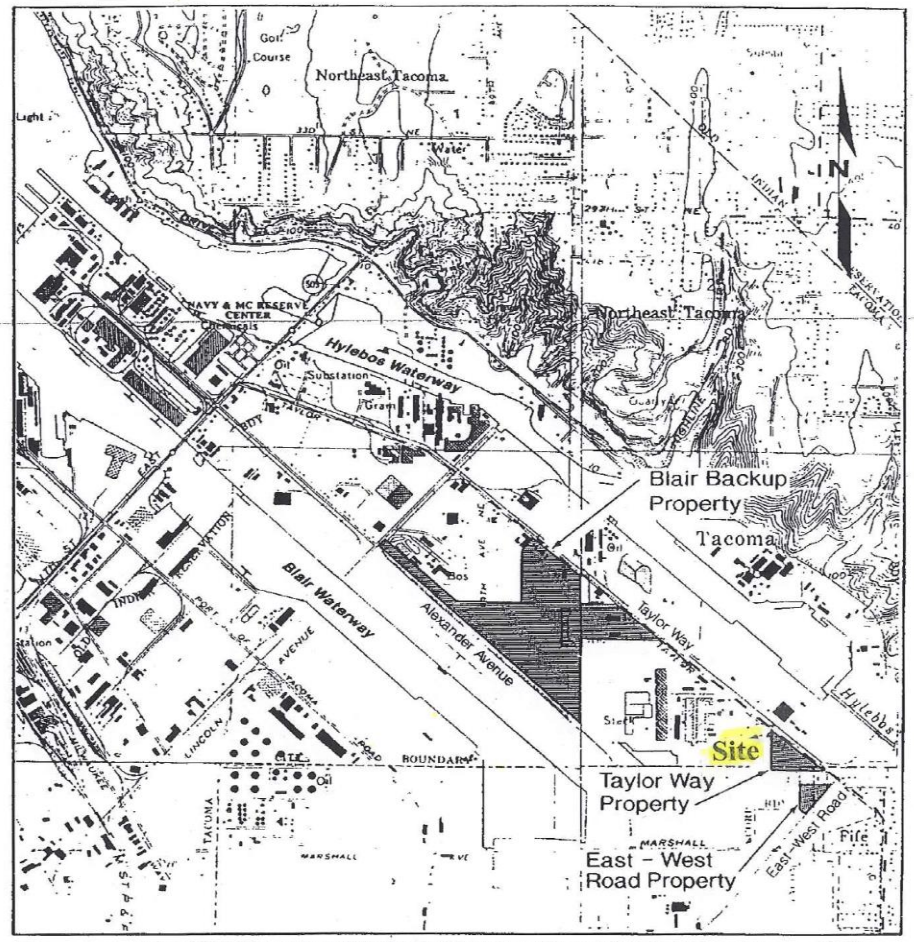
Hart Crowser, 1991b. Final Investigation Report, Taylor Way Property, Tacoma, Washington. Prepared for the Port of Tacoma.

Occidental Chemical Corporation, 1984. Tacoma Off-Plant Disposal Site Investigation, Bonneville Power Administration.

Department of Ecology, Site Visit, December 14, 2020.

6.0 APPENDICES

6.1 Vicinity Map



6.2 Site Plan

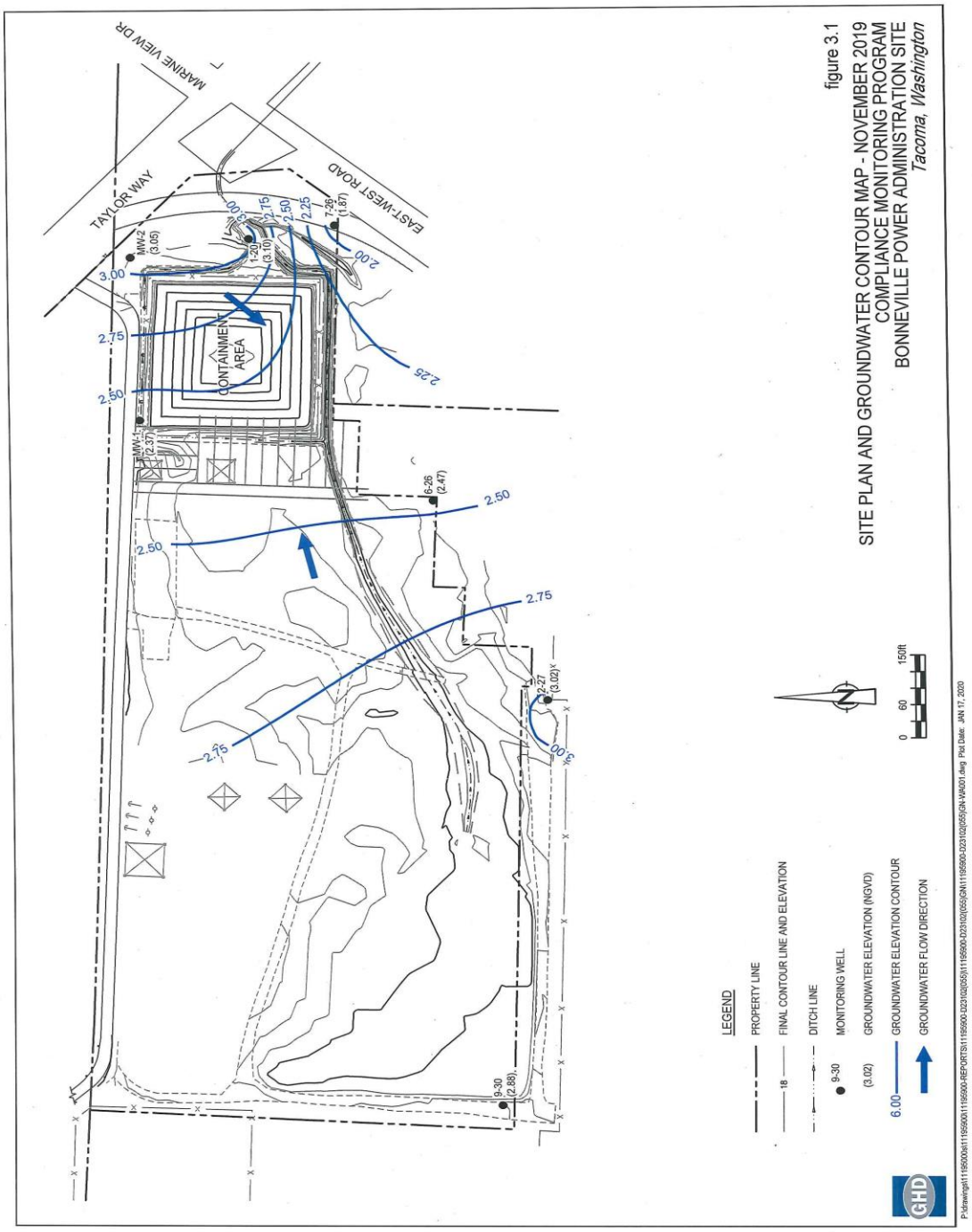
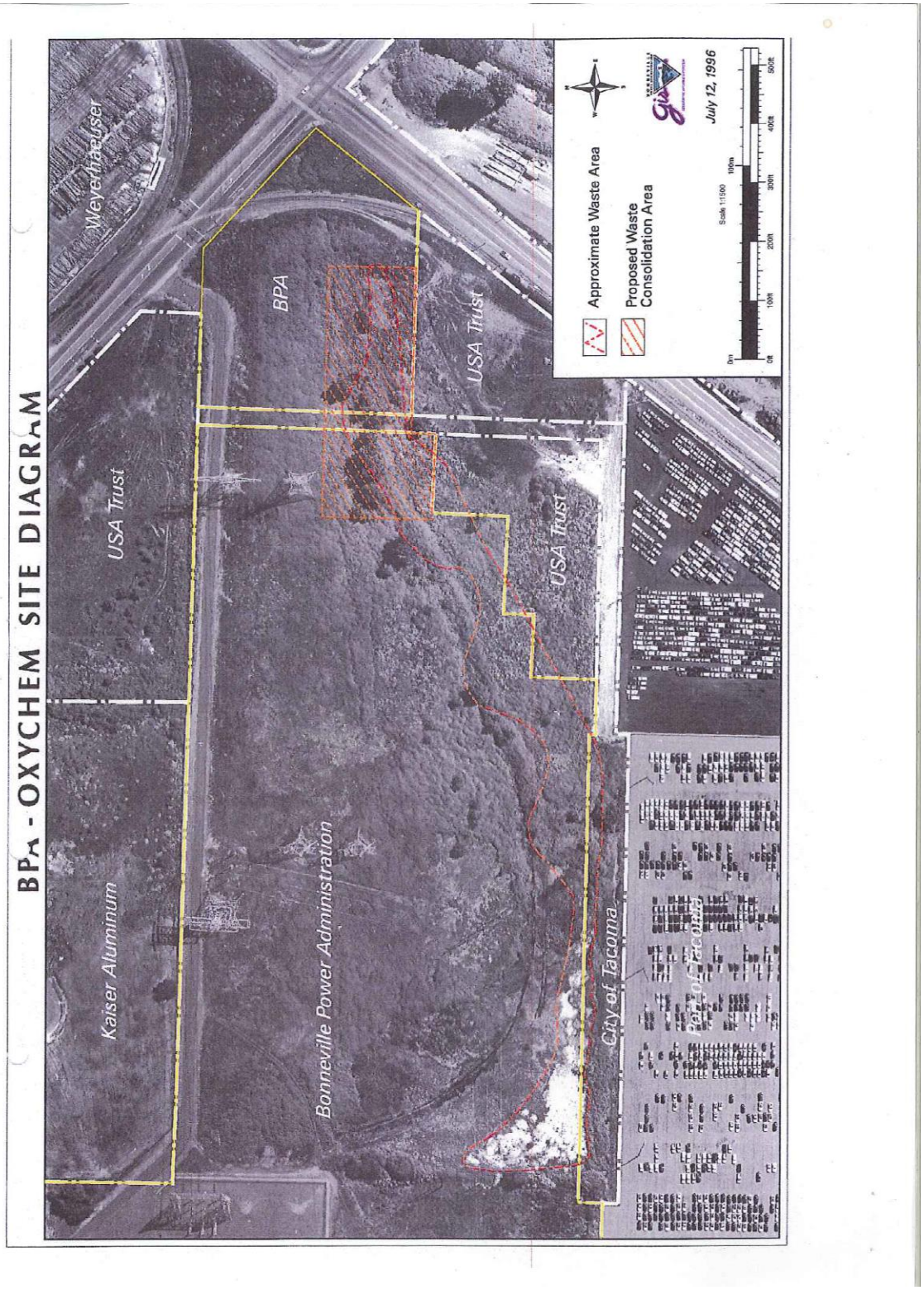


figure 3.1
SITE PLAN AND GROUNDWATER CONTOUR MAP - NOVEMBER 2019
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION SITE
Tacoma, Washington
MARINE VIEW DR
TAYLOR WAY
EAST-WEST ROAD
CONTAINMENT AREA
MW-2 (3.05)
MW-1 (2.37)
1-20 (3.10)
7-26 (1.87)
6-26 (2.47)
9-30 (2.88)
3.00
2.75
2.50
2.25
2.00
3.00
2.27 (3.02)
LEGEND
PROPERTY LINE
FINAL CONTOUR LINE AND ELEVATION
DITCH LINE
MONITORING WELL
GROUNDWATER ELEVATION (NGVD)
GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION
0 60 150ft
CHD


BPA - OXYCHEM SITE DIAGRAM
Weyerhaeuser
BPA
USA Trust
USA Trust
USA Trust
USA Trust
Kaiser Aluminum
Bonneville Power Administration
City of Tacoma
Approximate Waste Area
Proposed Waste Consolidation Area
July 12, 1996
Scale 1:1500

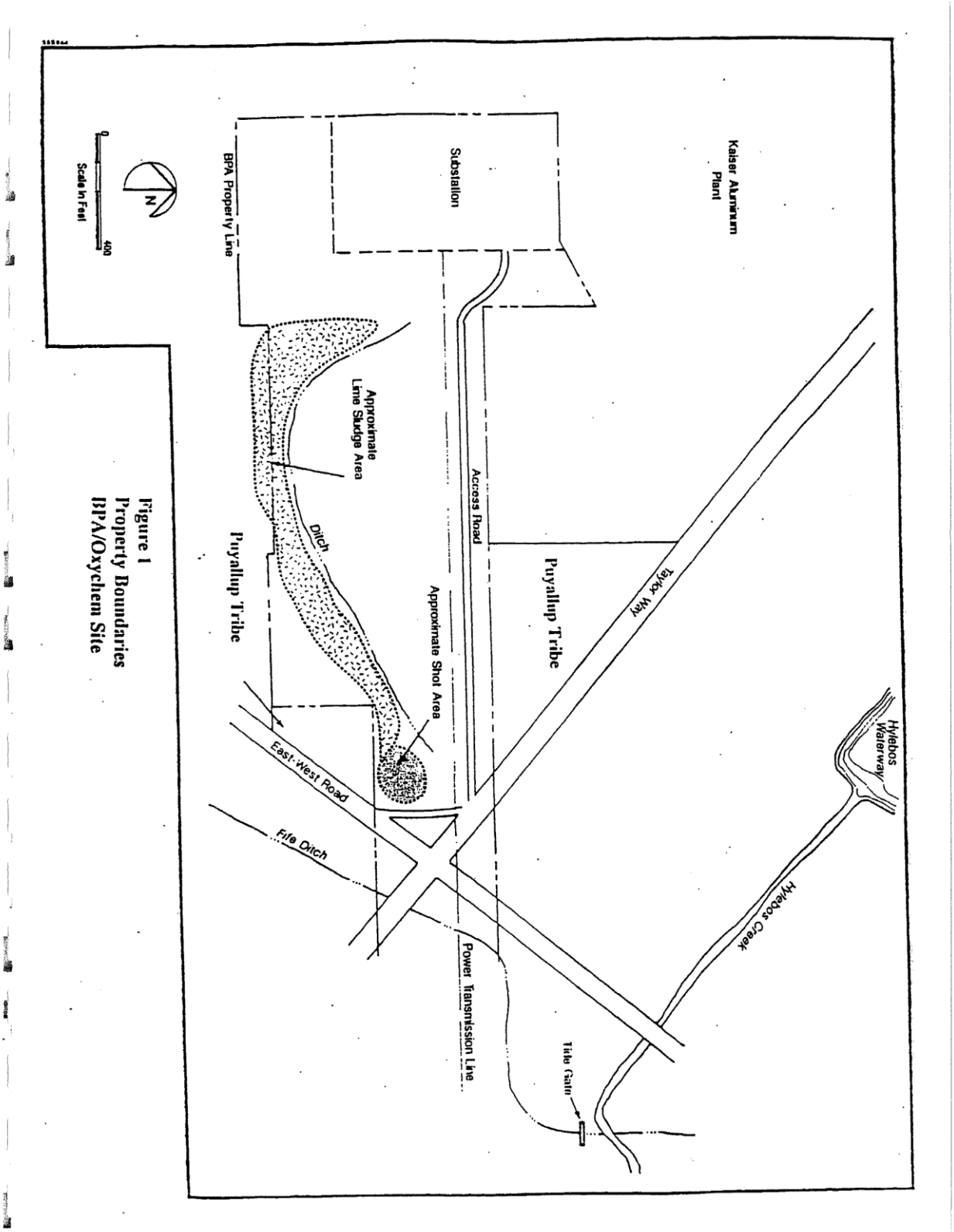
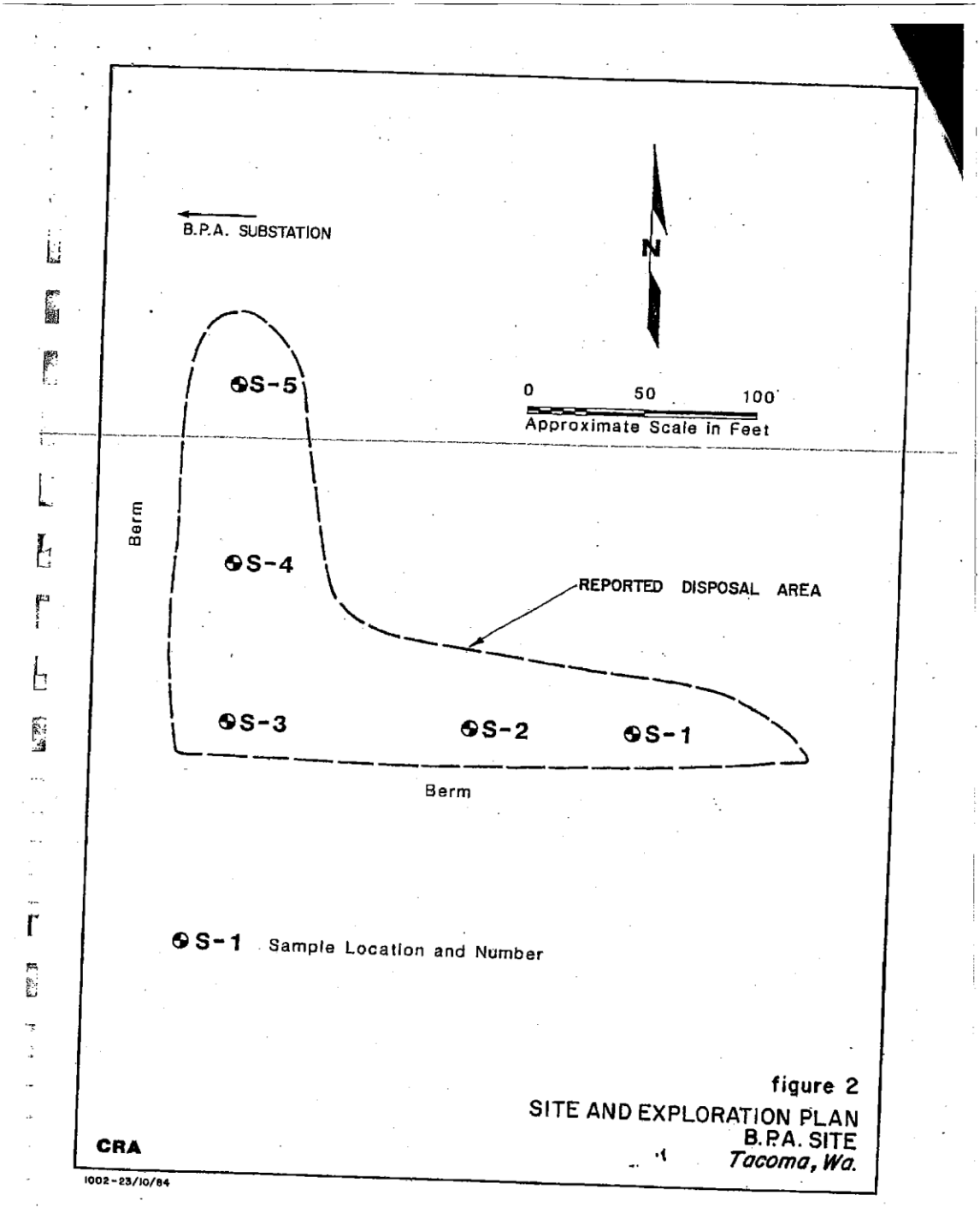
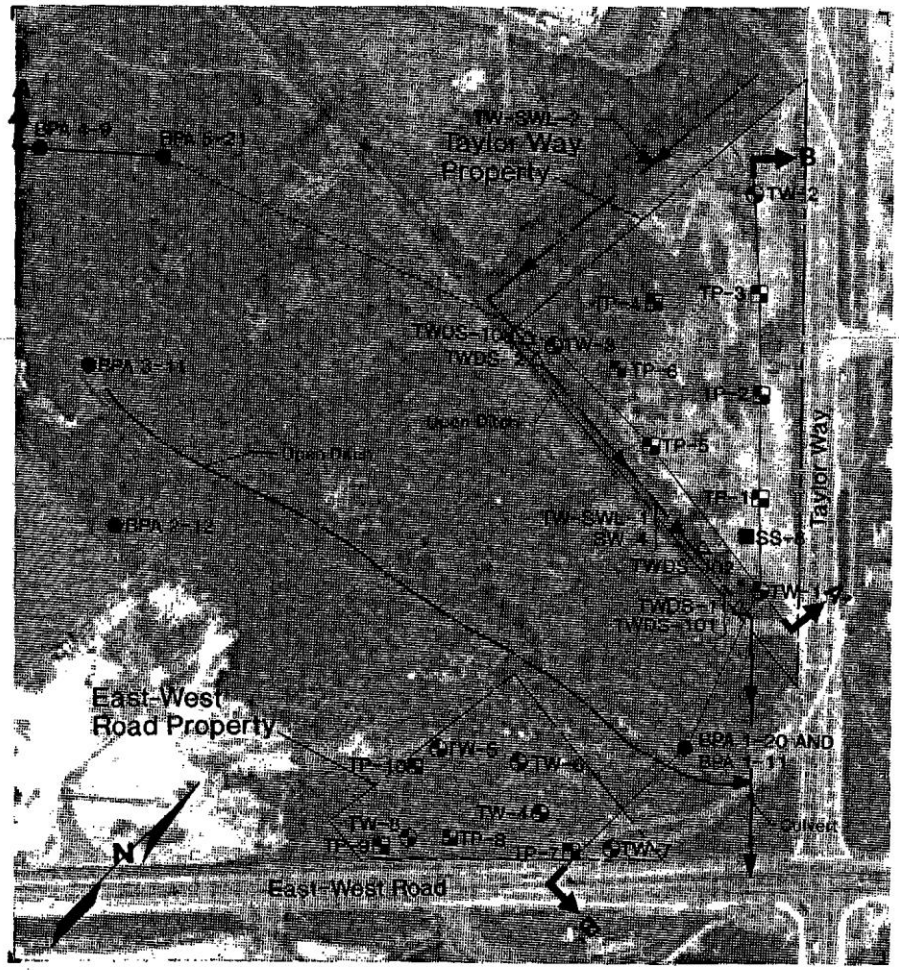


Figure 1
Property Boundaries
BPA/Oxychem Site

6.3 1984, 1990, and 1991 Site Investigations Sampling Locations



Site and Exploration Plan



⊕TW-2	Monitoring Well Location and Number	0 200 400
●BPA 1-11	Monitoring Well Location and Number (Others)	Approximate Scale in Feet
■TP-1	Test Pit Location and Number	
▲ TW-SWL-1 / SW-4	Surface Water Elevation Station Location and Number / Surface Water Sampling Location and Number	
■SS-8	Surface Soil Sample Location and Number	
△TWDS-1	Ditch Sediment Sample Location and Number	
A A'	Generalized Geologic Cross Section Location and Designation	

HARTCROWSER
J-2350-07 12/90
Figure 3 Page 62

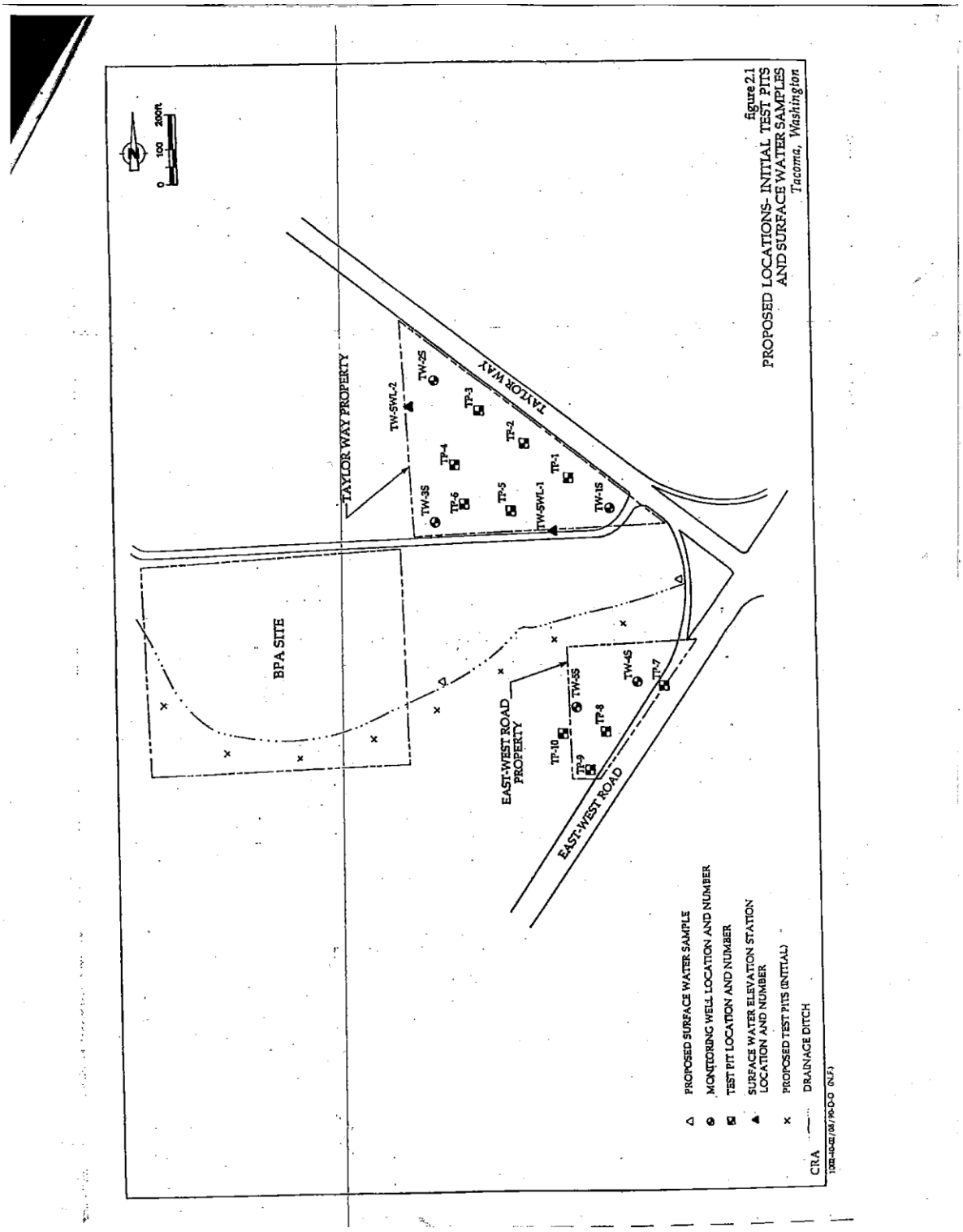
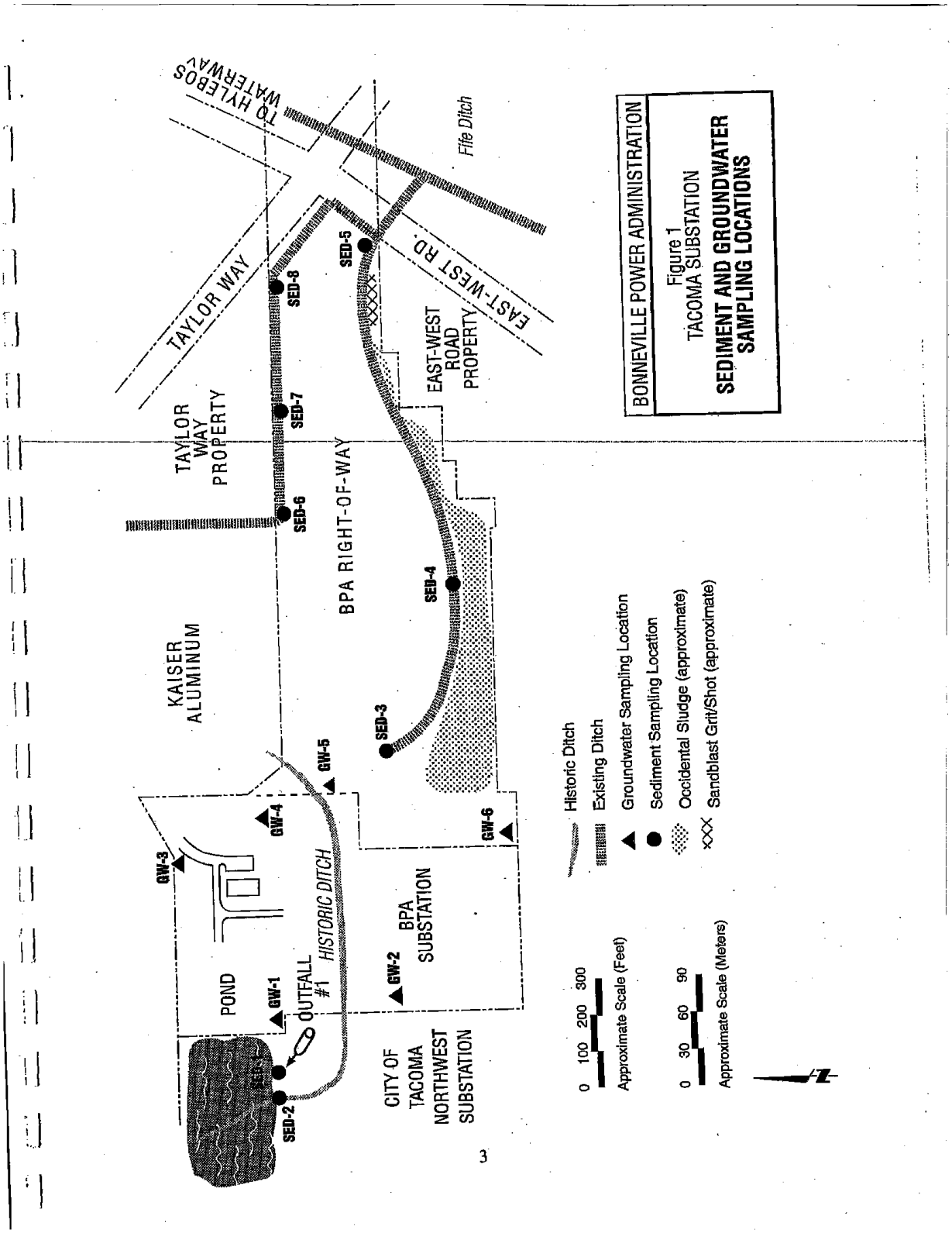
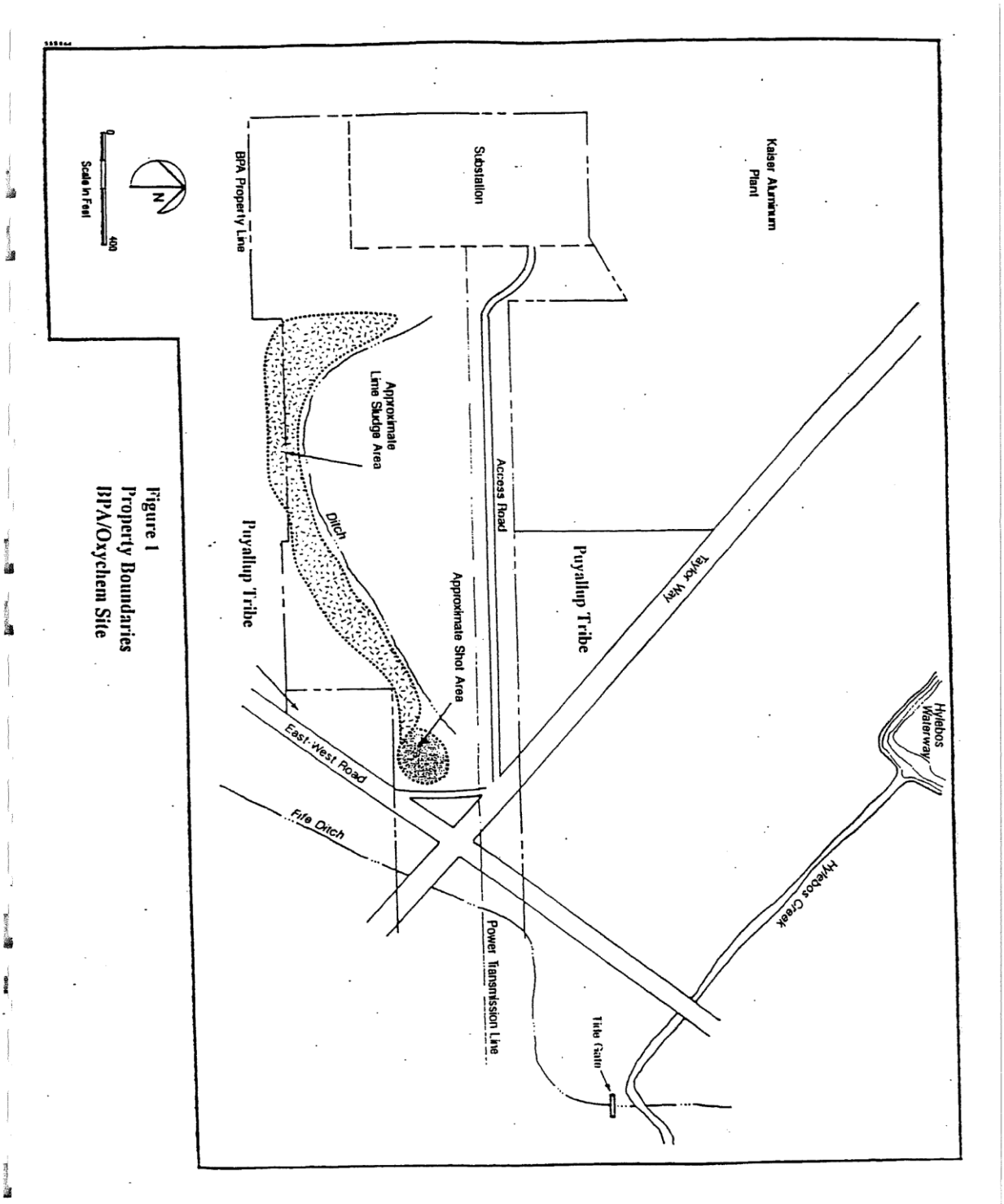


figure 2.1
PROPOSED LOCATIONS- INITIAL TEST PITS
AND SURFACE WATER SAMPLES
Tacoma, Washington
TAYLOR WAY
TAYLOR WAY PROPERTY
BPA SITE
EAST-WEST ROAD
EAST-WEST ROAD PROPERTY
TW-2S
TW-3S
TW-4S
TW-5S
TW-1S
TW-SWL-1
TW-SWL-2
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6
TP-7
TP-8
TP-9
TP-10
PROPOSED SURFACE WATER SAMPLE
MONITORING WELL LOCATION AND NUMBER
TEST PIT LOCATION AND NUMBER
SURFACE WATER ELEVATION STATION
LOCATION AND NUMBER
PROPOSED TEST PITS (INITIAL)
DRAINAGE DITCH
CRA


BONNEVILLE POWER ADMINISTRATION
Figure 1
TACOMA SUBSTATION
SEDIMENT AND GROUNDWATER SAMPLING LOCATIONS
TO HYLEBOS WATERWAY
Fife Ditch
TAYLOR WAY
EAST-WEST RD.
TAYLOR WAY PROPERTY
EAST-WEST ROAD PROPERTY
BPA RIGHT-OF-WAY
KAISER ALUMINUM
POND
OUTFALL #1
HISTORIC DITCH
BPA SUBSTATION
CITY OF TACOMA NORTHWEST SUBSTATION
SED-1
SED-2
SED-3
SED-4
SED-5
SED-6
SED-7
SED-8
GW-1
GW-2
GW-3
GW-4
GW-5
GW-6
Historic Ditch
Existing Ditch
Groundwater Sampling Location
Sediment Sampling Location
Occidental Sludge (approximate)
Sandblast Grit/Shot (approximate)
0 100 200 300
Approximate Scale (Feet)
0 30 60 90
Approximate Scale (Meters)
3

6.4 Landfill / Containment Facility Layout and Cap Cross-Section



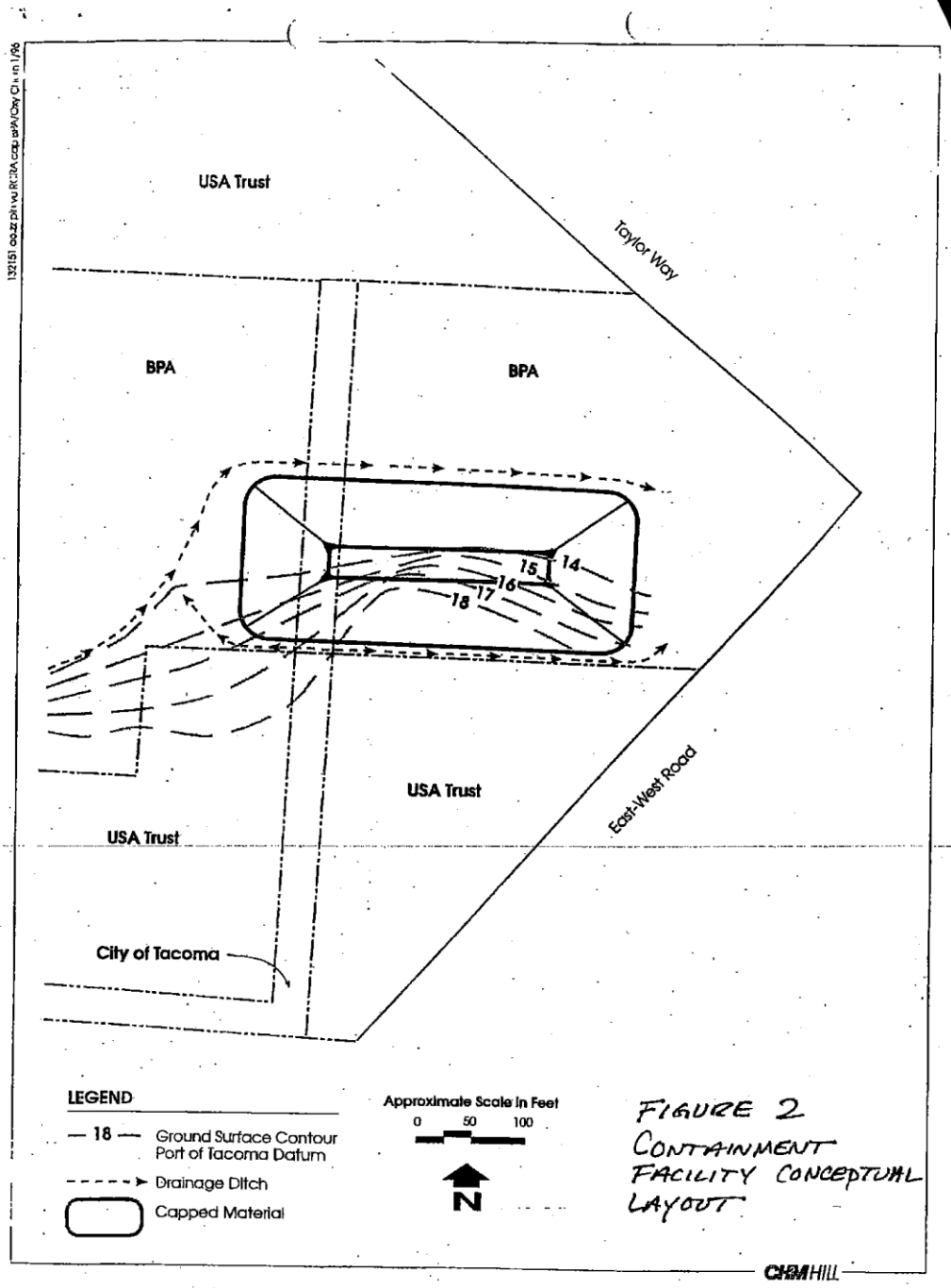
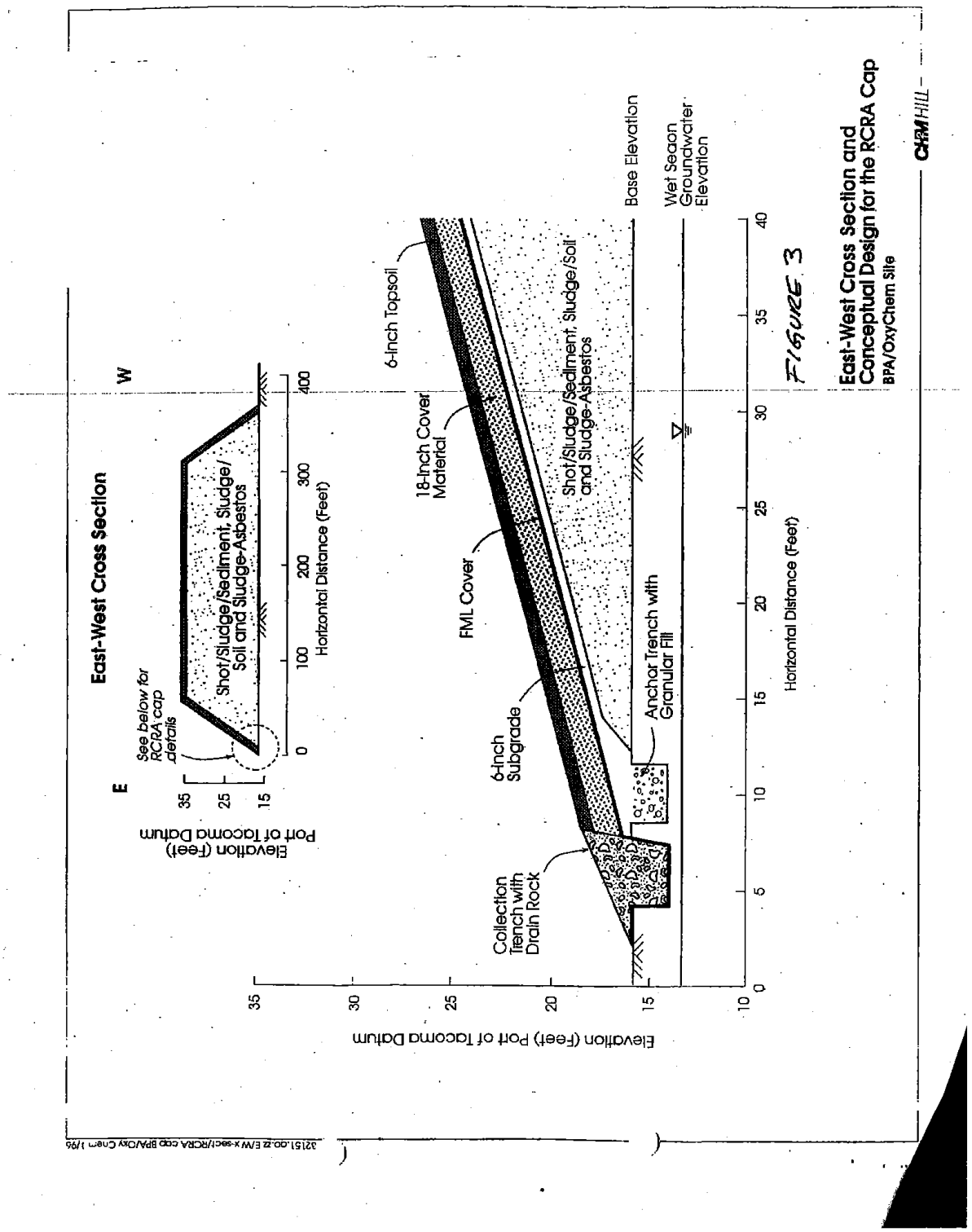


FIGURE 2
CONTAINMENT FACILITY CONCEPTUAL LAYOUT


East-West Cross Section and
Conceptual Design for the RCRA Cap
BPA/OxyChem Site
CH2MHILL
FIGURE 3
East-West Cross Section
W
E
See below for RCRA cap details
Shot/Sludge/Sediment, Sludge/ Soil and Sludge-Asbestos
Elevation (Feet) Port of Tacoma Datum
Horizontal Distance (Feet)
6-Inch Topsoil
18-Inch Cover Material
FML Cover
6-Inch Subgrade
Collection Trench with Drain Rock
Anchor Trench with Granular Fill
Base Elevation
Wet Seaon Groundwater Elevation
Shot/Sludge/Sediment, Sludge/Soil and Sludge-Asbestos
Elevation (Feet) Port of Tacoma Datum
Horizontal Distance (Feet)

6.5 Compliance Groundwater Monitoring: Monitoring Well Locations, Cis-1,2 DCE and Vinyl Chloride Concentration Trends, Approximate Groundwater Flow Direction (December 2019), and Groundwater Monitoring Results

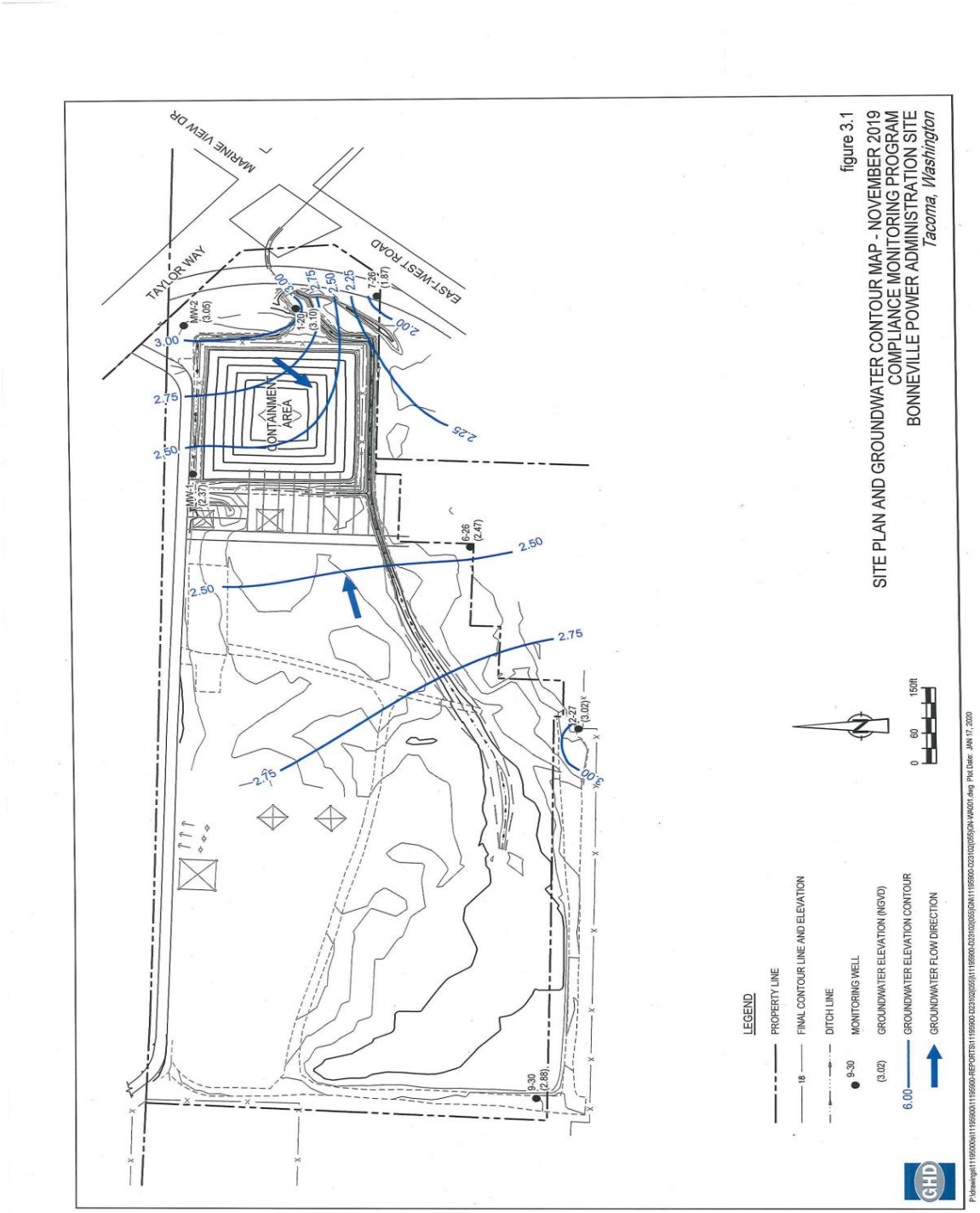


Table 3.4

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

Sample Location:			**1-20**	**7-26**	**1-20**
Sample ID:			**GW-112519-NT-1-20**	**GW-112519-NT-7-26**	**GW-112519-NT-FD1**
Sample Date:			**11/25/2019**	**11/25/2019**	**11/25/2019 (Duplicate)**
Parameter	**Units**	**Cleanup Level[1]**			
Volatile Organic Compounds					
cis-1,2-Dichloroethene	µg/L	70	23	11	23
Methylene chloride	µg/L	5	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	5	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	5	0.46 J	0.32 J	2.5 U
Vinyl chloride	µg/L	10*	2.1	4.9	2.3

Notes:
(1) Model Toxic Control Act (MTCA Method B Surface Water 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.

GHD 311158500-D23102-RPT-53

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[(1)]**			
Volatile Organic Compounds					
cis-1,2-Dichloroethene	µg/L	70	43	12	12
Methylene chloride	µg/L	5	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	5	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	5	2.5 U	0.21J	2.5 U
Vinyl chloride	µg/L	10*	0.5 U	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.

GHD 37894 (51)

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-111716-NT-1-20	GW-111716-NT-7-26	GW-111716-NT-FD-1
	Sample Date:		11/17/2016	11/17/2016	11/17/2016 (Duplicate)
Parameter	Units	Cleanup Level[1]			
Volatile Organic Compounds					
cis-1,2-Dichloroethene	µg/L	70	39J	27	38
Methylene chloride	µg/L	5	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	5	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	5	2.5 U	2.5 U	2.5 U
Vinyl chloride	µg/L	10*	3.7	7.1	11

Notes:
(1) Model Toxic Control Act (MTCA Method B Surface Water 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.

GHD 37894 (44)

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-111814-BP-1-20	GW-111814-BP-7-26	GW-111814-BP-FD-1
	Sample Date:		11/30/2015	12/1/2015	12/1/2015 (Duplicate)
Parameter	Units	Cleanup Level[1]			
Volatile Organic Compounds					
cis-1,2-Dichloroethene	µg/L	70	81	64	61
Methylene chloride	µg/L	5	2.0 U	2.0 U	2.0 U
Tetrachloroethene	µg/L	5	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	5	0.50 U	0.20 J	0.20 J
Vinyl chloride	µg/L	10*	10	18	17

Notes:
(1) Model Toxic Control Act (MTCA Method B Surface Water 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.

GHD 37894 (41)

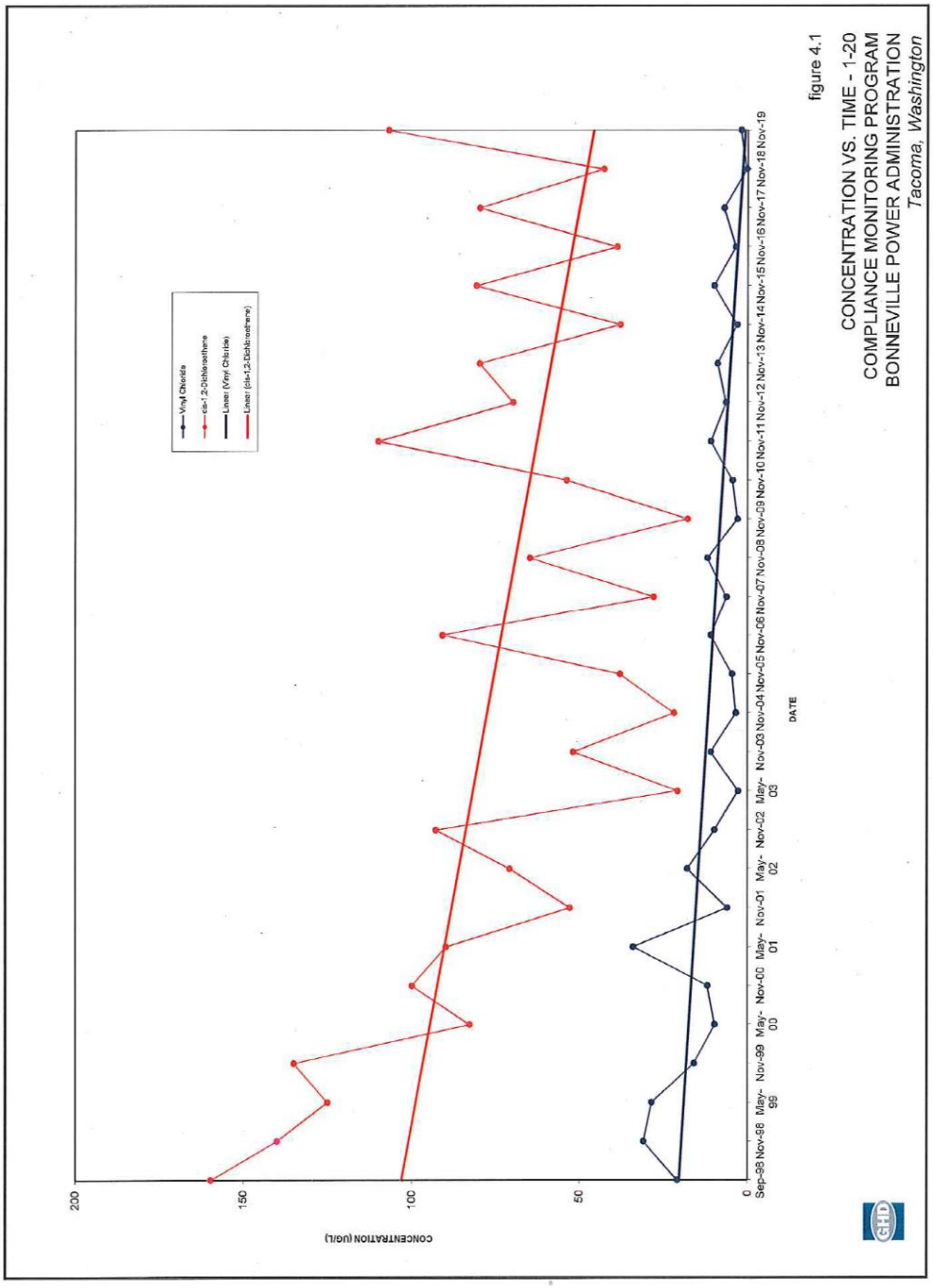


figure 4.1
CONCENTRATION VS. TIME - 1-20
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION
Tacoma, Washington
Vinyl Chloride
cis-1,2-Dichloroethene
Linear (Vinyl Chloride)
Linear (cis-1,2-Dichloroethene)
CONCENTRATION (ug/L)
0
50
100
150
200
DATE
Sep-98
Nov-98
May-99
Nov-99
May-00
Nov-00
May-01
Nov-01
May-02
Nov-02
May-03
Nov-03
Nov-04
Nov-05
Nov-06
Nov-07
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Nov-14
Nov-15
Nov-16
Nov-17
Nov-18
Nov-19

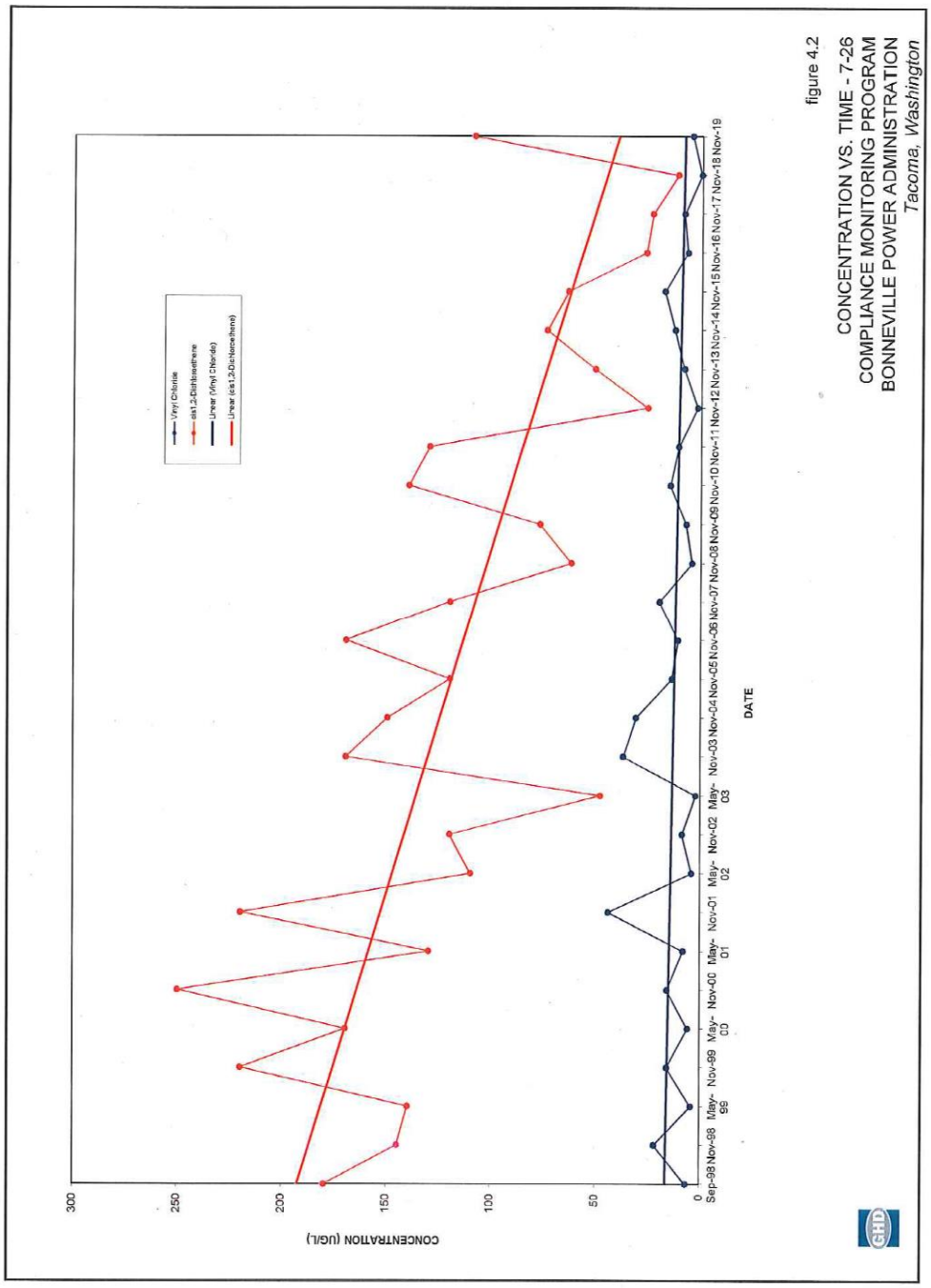


figure 4.2
CONCENTRATION VS. TIME - 7-26
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION
Tacoma, Washington
CONCENTRATION (UG/L)
DATE
Vinyl Chloride
cis1,2-Dichloroethene
Linear (Vinyl Chloride)
Linear (cis1,2-Dichloroethene)
300
250
200
150
100
50
0
Sep-98 Nov-98 May-99 Nov-99 May-00 Nov-00 May-01 Nov-01 May-02 Nov-02 May-03 Nov-03 Nov-04 Nov-05 Nov-06 Nov-07 Nov-08 Nov-09 Nov-10 Nov-11 Nov-12 Nov-13 Nov-14 Nov-15 Nov-16 Nov-17 Nov-18 Nov-19

6.6 Quit Claim Deed and Environmental Covenant

200101190200 9 pg
1-19-2001 10:19am $16.00
PIERCE COUNTY, WASHINGTON

AFTER RECORDING RETURN TO:
Edward G. Hudson
Smith Alling Lane
1102 Broadway, #403
Tacoma, WA 98402

QUIT CLAIM DEED

Grantor: United States of America, Department of Energy, Bonneville Power Administration ("BPA")
Grantee: Occidental Chemical Corporation ("OCC")
Tax Parcel No.: 03-20-01-1-074
Related Documents: Consent Decree dated March 3, 1997 (Superior Court of Washington for Pierce County, Cause No. 97-2-06046-5); Easement Agreement between BPA and OCC dated 1/3/2001.
Notice of Building Restriction: The described property contains hazardous waste materials governed by a State of Washington Department of Ecology Consent Decree, and is deemed an unbuildable site under the zoning and land use documents of the City of Tacoma.
Abbreviated Legal Description: Full legal description stated below.

A PORTION OF GOVERNMENT LOTS 1 AND 2 OF SECTION 1, TOWNSHIP 20 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, PIERCE COUNTY, WASHINGTON, AND ALSO PART OF CHICAGO ROCK ISLAND AND PACIFIC ADDITION TO TACOMA, AS RECORDED IN VOLUME 10 OF PLATS AT PAGE 11, RECORDS OF SAID COUNTY, THAT LIES WITHIN THE BONNEVILLE POWER ADMINISTRATION (B.P.A.) COVINGTON – TACOMA NO. 2 TRANSMISSION LINE RIGHT-OF-WAY.

THIS DEED made this 3 day of January, 2001, between the UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY, BONNEVILLE POWER ADMINISTRATION, hereinafter called Grantor, and OCCIDENTAL CHEMICAL CORPORATION, hereinafter called Grantee.

1

ETN: 1050291 1-19-2001
Excise Tax Collected: $0.00
Affidavit Processing Fee: $2.00
16 Cathy Pearsall-Stipek CPO Pierce County Auditor
BY: ROBIN CAROVANO

NOW THEREFORE, the Grantor, for and in consideration of One Hundred Fifty Thousand and 00/100 Dollars ($150,000.00), the receipt whereof is hereby duly acknowledged, does hereby remise, release, and quitclaim unto the Grantee, its heirs, successors and assigns, subject to the restrictions and reservation described below, all Grantor's right, title, interest and claim in and to a parcel of land described as follows:

NEW PARCEL "B"

A PORTION OF GOVERNMENT LOTS 1 AND 2 OF SECTION 1, TOWNSHIP 20 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, PIERCE COUNTY, WASHINGTON, AND ALSO PART OF CHICAGO ROCK ISLAND AND PACIFIC ADDITION TO TACOMA AS RECORDED IN VOLUME 10 OF PLATS AT PAGE 11, RECORDS OF SAID COUNTY, THAT LIES WITHIN THE BONNEVILLE POWER ADMINISTRATION (B.P.A.) COVINGTON -- TACOMA NO. 2 TRANSMISSION LINE RIGHT-OF-WAY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTH ONE-QUARTER CORNER OF SAID SECTION 1; THENCE SOUTH 87°32'46" EAST, ALONG THE NORTH LINE OF SAID SECTION 1, 165.91 FEET TO THE SOUTH ONE-QUARTER CORNER OF SECTION 36, TOWNSHIP 21 NORTH, RANGE 3 EAST; THENCE CONTINUING ALONG THE NORTH LINE OF SAID SECTION 1, SOUTH 88°14'34" EAST, 1149.13 FEET TO THE NORTHEAST CORNER OF SAID PLAT OF CHICAGO ROCK ISLAND AND PACIFIC ADDITION TO TACOMA; THENCE SOUTH 02°36'52" WEST, 44.67 FEET ALONG THE EAST LINE OF SAID PLAT, ALSO BEING THE EAST LINE OF VACATED FRANK STREET AS VACATED BY CITY OF TACOMA ORDINANCE NO. 26123 DATED JANUARY 13, 1998 AND THE POINT OF BEGINNING; THENCE SOUTH 87°38'49" EAST, 326.24 FEET ON A LINE PARALLEL WITH AND 8.0 FEET NORTH OF AN EXISTING CHAIN LINK FENCE, TO THE SOUTHWESTERLY RIGHT-OF-WAY LINE OF TAYLOR WAY; THENCE SOUTH 47°52'03" EAST, 110.74 FEET ALONG SAID RIGHT-OF-WAY, TO THE WESTERLY RIGHT-OF-WAY LINE OF SR-509 AS ACQUIRED BY THE STATE OF WASHINGTON AS SHOWN ON STATE HIGHWAY PLANS FOR SR-509 MILWAUKEE WAY TO TAYLOR WAY ALIGNMENT/RIGHT-OF-WAY PLANS, SHEET NO. 36 OF 241; THENCE SOUTH 03°49'58" EAST, 153.44 FEET ALONG SAID WESTERLY RIGHT-OF-WAY LINE TO STATION NFR 124+63.01, LEFT 35 FEET FROM THE CENTERLINE OF SAID NFR LINE; THENCE SOUTH 40°23'11" WEST, 99.21 FEET ALONG THE NORTHWESTERLY RIGHT-OF-

WAY LINE OF SR-509 OF SAID HIGHWAY PLANS TO THE SOUTH LINE OF SAID B.P.A. COVINGTON -- TACOMA NO. 2 TRANSMISSION RIGHT-OF-WAY AS SHOWN ON PLANS DATED MARCH 18, 1963, DRAWING NO. C-109-345-D1; THENCE NORTH 88°14'34" WEST, 368.17 FEET ALONG SAID B.P.A. RIGHT-OF-WAY LINE TO THE EAST LINE OF SAID PLAT OF CHICAGO ROCK-ISLAND AND PACIFIC ADDITION TO TACOMA, ALSO BEING THE EAST RIGHT-OF-WAY LINE OF AFOREMENTIONED VACATED FRANK STREET; THENCE CONTINUING NORTH 88°14'34" WEST, 30.00 FEET ALONG SAID B.P.A. RIGHT-OF-WAY TO THE WEST LINE OF VACATED FRANK STREET AND THE EAST LINE OF BLOCK 3 OF SAID PLAT; THENCE SOUTH 02°36'52" WEST, 41.14 FEET ALONG SAID EAST LINE OF BLOCK 3 TO THE SOUTHEAST CORNER OF LOT 15 OF SAID BLOCK 3; THENCE NORTH 87°21'52" WEST, 46.89 FEET; THENCE NORTH 01°13'34" EAST, 346.66 FEET ALONG A LINE THAT IS PARALLEL WITH AND 15.5 FEET WESTERLY OF AN EXISTING CHAIN LINK FENCE, TO A LINE BEARING NORTH 87°38'49" WEST, FROM THE POINT OF BEGINNING; SAID LINE BEING PARALLEL WITH AND 8.0 FEET NORTH OF AN EXISTING CHAIN LINK FENCE; THENCE SOUTH 87°38'49" EAST, 85.29 FEET ALONG SAID PARALLEL LINE TO THE POINT OF BEGINNING.

SUBJECT TO EASEMENTS, RESTRICTIONS, RESERVATIONS, AND COVENANTS OF RECORD.

CONTAINING 3.42 ACRES, MORE OR LESS.

SITUATE IN THE CITY OF TACOMA, PIERCE COUNTY, WASHINGTON.

Also, the Grantor conveys an easement for access to the above-described site over the existing BPA Tacoma substation access road to the site (or if the existing access is removed for any reason, then a substitute access). This easement is appurtenant to the above-described land and is further described as follows:

An existing paved roadway 18 feet in width on the northern portion of property owned in fee by the U.S. Department of Energy, Bonneville Power Administration, beginning in Government Lot 1 and ending in Government Lot 2, Section 1, Township 20 North, Range 3 East, Willamette Meridian, Pierce County, State of Washington as shown on the drawing copied from the Boundary Line Adjustment documents recorded under Pierce County Auditor File No. 200101195001 and marked Exhibit A.

3

Restrictions. This property (hereinafter called the Property) is subject to the following restrictions:

1. The Property is subject to the Declaration of Restrictive Covenants, attached as Exhibit B hereto, which is incorporated by reference;

2. Any change in use or in the size of the engineered containment facility located on the Property and described in Exhibit A (as such engineered containment facility exists on the date of this Deed) requires the written concurrence of the Grantor; and

3. No equipment shall be used, nor activity undertaken, on the Property within 15 vertical feet of Grantor's electric transmission line conductors without first consulting Grantor who shall provide conditions for equipment use and activity.

Reservation. Reserving to the United States of America from Property so granted:

Reserving to the United States of America, Department of Energy, Bonneville Power Administration, and its assigns, a perpetual non-exclusive easement and right-of-way for the limited purposes of above-ground electric power transmission and communications across, upon, and over, all the above-described Property. This reservation includes the right to enter and to locate, construct, operate, maintain, repair, rebuild, upgrade, remove, and patrol the existing above-ground electric transmission facilities, as well as one or more future lines of poles or structures and appurtenances thereto, supporting above-ground conductors of one or more electric circuits of any voltage as well as above-ground communication facilities, together with the present and future right to keep the Property free and clear of all structures, trees, brush, vegetation, and fire hazards; provided that all such activities are consistent with the provisions of the Declaration of Restrictive Covenants attached hereto as Exhibit B. Grantor shall give Grantee at least ten (10) days prior written notice of any construction or removal of any facilities located on the Property. Furthermore, in the event that any of Grantor's activities actually or potentially compromise or threaten the integrity or operation of the engineered containment facility, or related monitoring wells, Grantor shall immediately cease such activities, notify Grantee regarding the situation as soon as reasonably possible, and restore, at Grantor's expense, any and all damaged areas to its original condition. All such notices shall be provided to Grantee at Occidental Chemical Corporation, Attn: Al Meek, Director, Environmental Affairs, Glenn Springs Holding, Inc., 2480 Fortune Drive, #300, Lexington, Kentucky 40509 (telephone: 1-859-543-2153; facsimile: 1-859-543-2171; e-mail: Al_Meek@oxy.com), or at such

other addresses as Grantee may designate in writing to Grantee in the future. Title to trees and merchantable timber hereafter growing on the Property shall remain in the United States.

Grantor and Grantee do hereby release, protect, indemnify, and agree to hold the other party harmless from and against any and all liabilities, losses, damages, expenses, actions, and claims, including reasonable attorneys' fees and costs incurred in the defense thereof, arising directly or indirectly as a result of the acts or omissions of the indemnifying party, its servants, agents, licensees, invitees, employees, and contractors in connection with any use by such indemnifying party of the BPA Property or OCC Property pursuant to this Agreement; provided, however, that this paragraph does not purport to indemnify any party for damages arising out of or resulting from the negligence of the indemnified party, its agents, or employees.

It is also noted that:

Grantor and Grantee acknowledge that both have been named by the Environmental Protection Agency (EPA) as Potentially Responsible Parties (PRPs) at the Commencement Bay Nearshore/Tideflats Superfund Site, which includes the Property that is being transferred to Grantee, as described in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) § 120(h), 42 USC § 9620(h). Grantor and Grantee agree that this transaction meets all requirements for federal transfer of real property described in CERCLA § 120(h), including subsection (3).

Grantee agrees to release, protect, indemnify, and hold Grantor harmless from and against any environmental claims associated with the Property that arise out of release of hazardous substances occurring after the transfer of the Property to Grantee, including claims made pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC § 6901, the Resource Conservation and Recovery Act (RCRA), 42 USC § 6901, the Toxic Substances Control Act (TSCA), 15 USC § 2601, and related state statutes including the Washington Model Toxic Control Act, RCW 70, 105D, unless such releases were caused by Grantor or its servants, agents, licensees, invitees, employees, and/or contractors.

IN WITNESS WHEREOF, the Grantor, by its duly authorized representative has executed this deed pursuant to the delegation of authority promulgated in by the Acts of August 20, 1937 (50 Stat. 732, 16 USC § 832a), as amended, and October 23, 1962 (76 Stat. 1129, 40 USC § 319) and regulations, and delegations of authority issued pursuant thereto, the provisions of which have been met, having been determined that the conveyance is in the public interest and will not be adverse to the interests of the United States.

Dated at Portland, Oregon, this 3 day of January, 2001.

UNITED STATES OF AMERICA
Department of Energy
Bonneville Power Administration

By: John R. Cowger
John R. Cowger
Manager for Real Property Services

STATE OF OREGON)
: ss.
COUNTY OF MULTNOMAH)

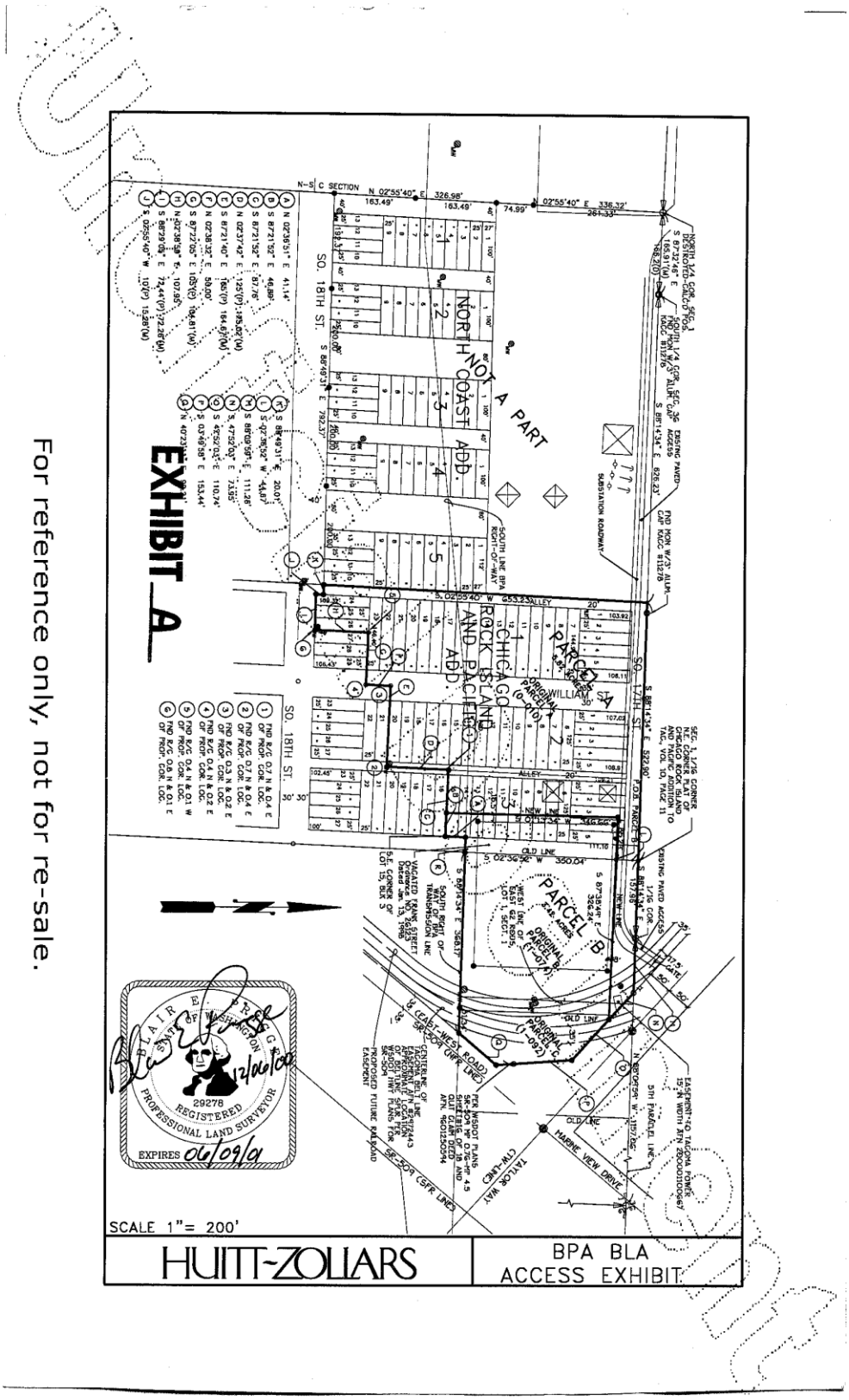
On this day personally appeared before me JOHN R. COWGER, to me known to be the Manager for Real Property Services, Bonneville Power Administration, who subscribed to and executed the within instrument and acknowledged that he signed the same as his free and voluntary act and deed for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this 3 day of January, 2001.

Sue Kinish
NOTARY PUBLIC for the State of Oregon
My Commission Expires 12-8-02

OFFICIAL SEAL
SUE KINISH
NOTARY PUBLIC-OREGON
COMMISSION NO. 318645
MY COMMISSION EXPIRES DEC. 8, 2002

6



For reference only, not for re-sale.

Restrictive Covenant

EXHIBIT B
DECLARATION OF RESTRICTIVE COVENANT

The Property that is the subject of this Restrictive covenant is the subject of remedial action under Chapter 70.105D RCW. The work done to clean up the Property (hereafter the "Cleanup Action") is described in Washington State Department of Ecology Consent Decree No. 97-2-06046-5, dated March 3, 1997 (Superior Court of Washington for Pierce County, and in attachments to the Decree. This Restrictive Covenant is required by WAC 173-340-440 because the Cleanup Action at the Site will result in residual concentrations of arsenic and lead which exceed Ecology's Method A, and C cleanup levels for Industrial soil established under WAC 173-340-745.

The Occidental Chemical Corporation ("OCC") is the fee owner of real property formerly a part of the Bonneville Power Administration ("BPA") Tacoma substation property in the county of Pierce, state of Washington (legal description attached in the Quit Claim Deed between BPA and OCC), hereafter referred to as the "Site."

As a result of the Cleanup Action, the Site includes an engineered containment facility including a multi-layer cap system, drainage system and monitoring system. This facility contains lime sludge (containing volatile organic compounds and asbestos) and metals-containing baghouse grit.

OCC makes the following declaration as to limitations, restrictions, and uses to which the Site may be put, and specifies that such declarations shall constitute covenants to run with the land, as provided by law, and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Site.

Section 1. the Site may be used only for Industrial uses as defined in and allowed under the city of Tacoma's Zoning Regulations codified in the Tacoma City code as of the date of this Restrictive Covenant.

Section 2. Any activity on the Site is prohibited that may interfere with or reduce the effectiveness of the Cleanup Action, operation and maintenance, monitoring, or other activity required by the Decree. Any activity on the Site that may result in the release of a hazardous substance that was contained as a part of the Cleanup Action is prohibited.

Section 3. The owner of the Site must give written notice to the Department of Ecology, or to a successor agency, of the owner's intent to convey any interest in the Site. No conveyance of title, easement, lease or other interest in the Site shall be consummated by the owner without adequate and complete provision for the continued operation, maintenance and monitoring of the cleanup Action.

Section 4. The owner must notify and obtain approval from the Department of Ecology, or from a successor agency, prior to any use of the Site that may be inconsistent with the terms of this Restrictive Covenant. The Department of Ecology, or its successor agency, may approve such a use only after public notice and comments.

Section 5. The owner shall allow authorized representative of the Department of Ecology, or of a successor agency, the right to enter the Site at reasonable times for the purpose of evaluating compliance with the Cleanup Action Plan and the Order, to take samples, to inspect Cleanup Actions conducted at the Site, and to inspect records that are related to the Cleanup Action.

Section 6. The owner of the Site and owner's assigns and successors in interest reserve the right under WAC 173-340-730 and WAC 173-340-440 to record an instrument which provides that this Restrictive Covenant shall no longer limit the use of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of the Department of Ecology or of a successor agency. The Department of Ecology or a successor agency may consent to the recording of such an instrument only after public notice and comment.

OCCIDENTAL CHEMICAL CORPORATION

By: _____
John Hildebrand, Director -- Real Estate
Dated: December 12, 2000

6.7 Photo Log

Photo 1: Landfill/Waste Sludge Containment Area, Perimeter Fence Gate, and Groundwater Monitoring Well MW-1 – From the Southwest.

Photo 2: Landfill/Waste Sludge Containment Area, Perimeter Fence and Drainage System - From the Southeast.

Photo 3: Landfill/Waste Sludge Containment Area, Perimeter Fence and Drainage System - From the Southeast.

Photo 4: Landfill/Waste Sludge Containment Area, Perimeter Fence - From the Southeast.

Photo 5: Up-Gradient Groundwater Monitoring Well MW-1 – From the Northwest.

Photo 6:Down-Gradient Groundwater Monitoring Well 1-20.

Enclosure B

Ecology Responses to CHB's comments

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Electronic Copy

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • 360-407-6300
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

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,

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
Ecology Site File

ENCLOSURE – A

Previous Groundwater Flow Direction
2015, 2016 and 2018 Sampling Events

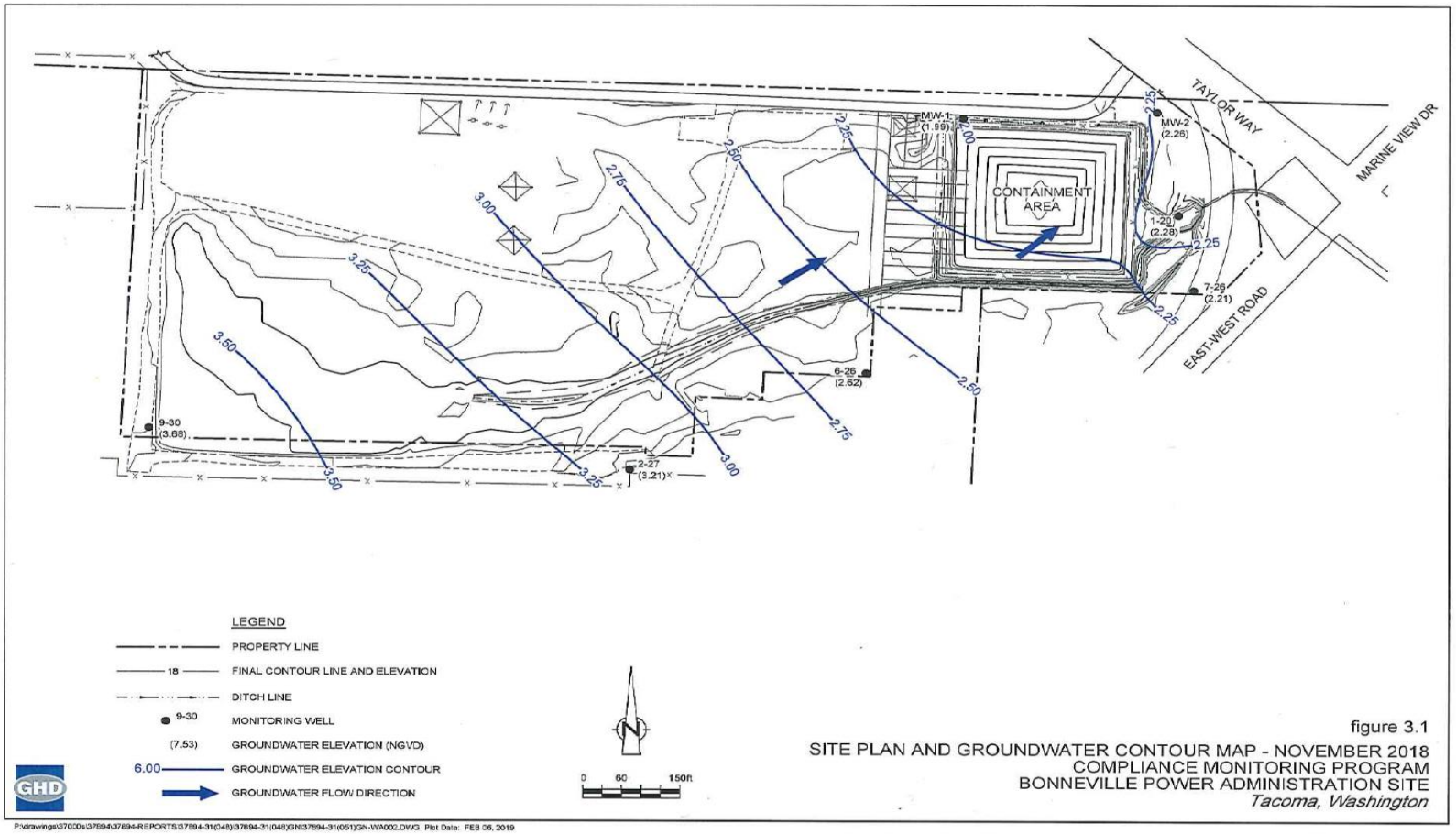

figure 3.1

SITE PLAN AND GROUNDWATER CONTOUR MAP - NOVEMBER 2018
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION SITE
Tacoma, Washington

P:\drawings\37000s\37694\37694-REPORTS\37894-31(048)\37894-31(048)GN\37894-31(051)GN-WA002.DWG Plot Date: FEB 06, 2019

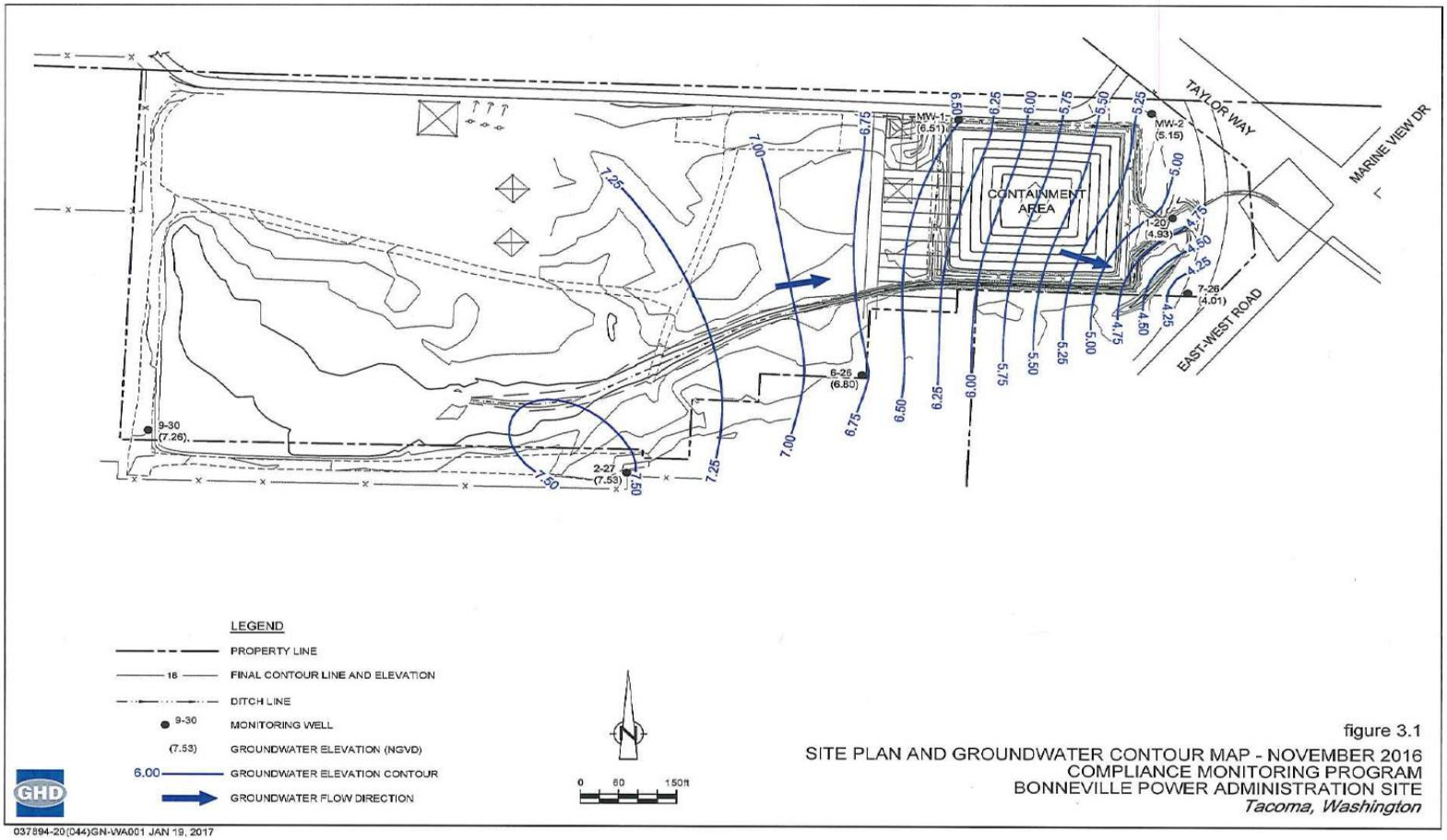

figure 3.1

SITE PLAN AND GROUNDWATER CONTOUR MAP - NOVEMBER 2016
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION SITE
Tacoma, Washington

037894-20(044)GN-WA001 JAN 19, 2017

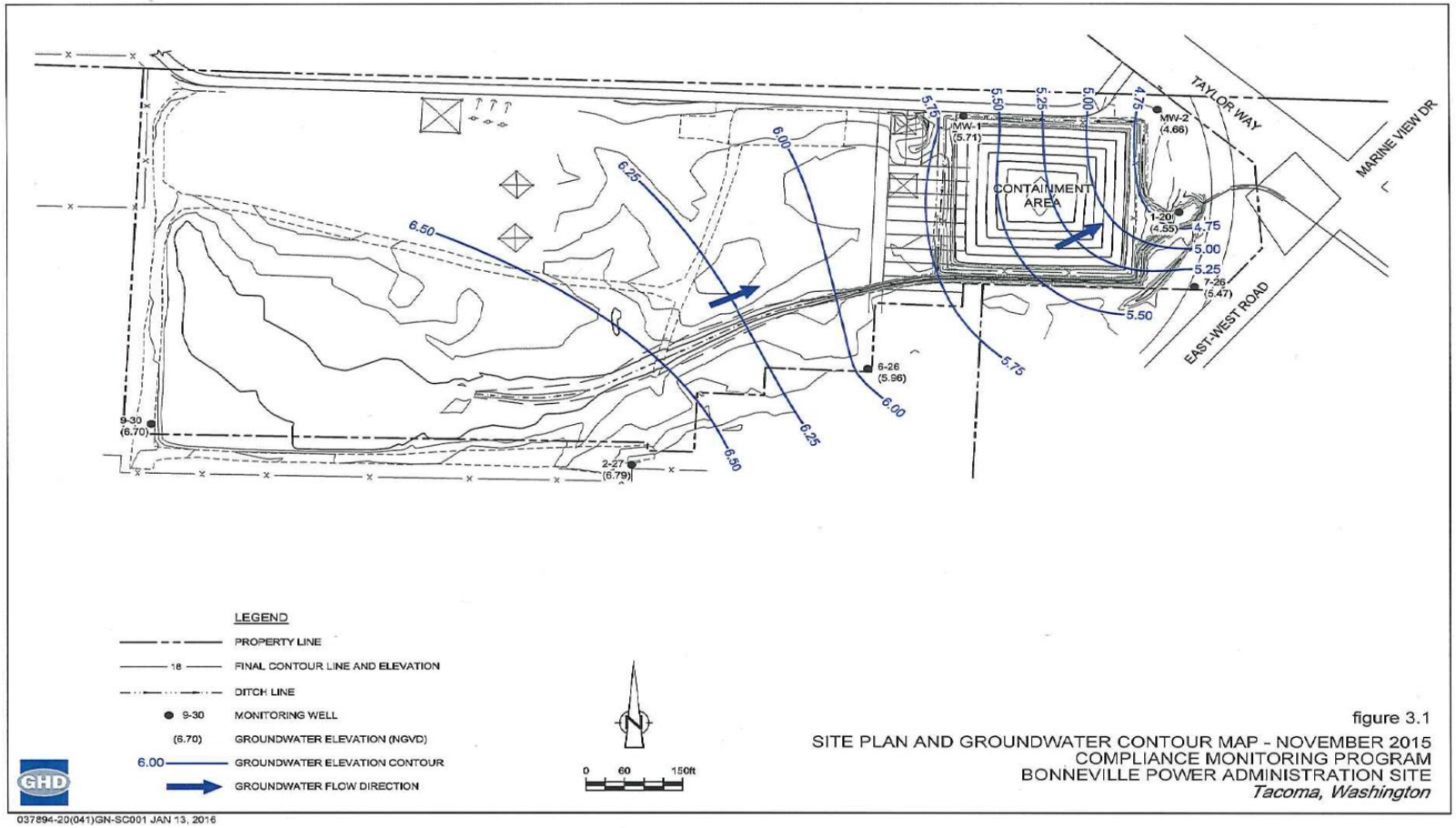

figure 3.1

SITE PLAN AND GROUNDWATER CONTOUR MAP - NOVEMBER 2015
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION SITE
Tacoma, Washington

037894-20(041)GN-SC001 JAN 13, 2016

ENCLOSURE – B

Groundwater Flow Direction-2019 Sampling Event

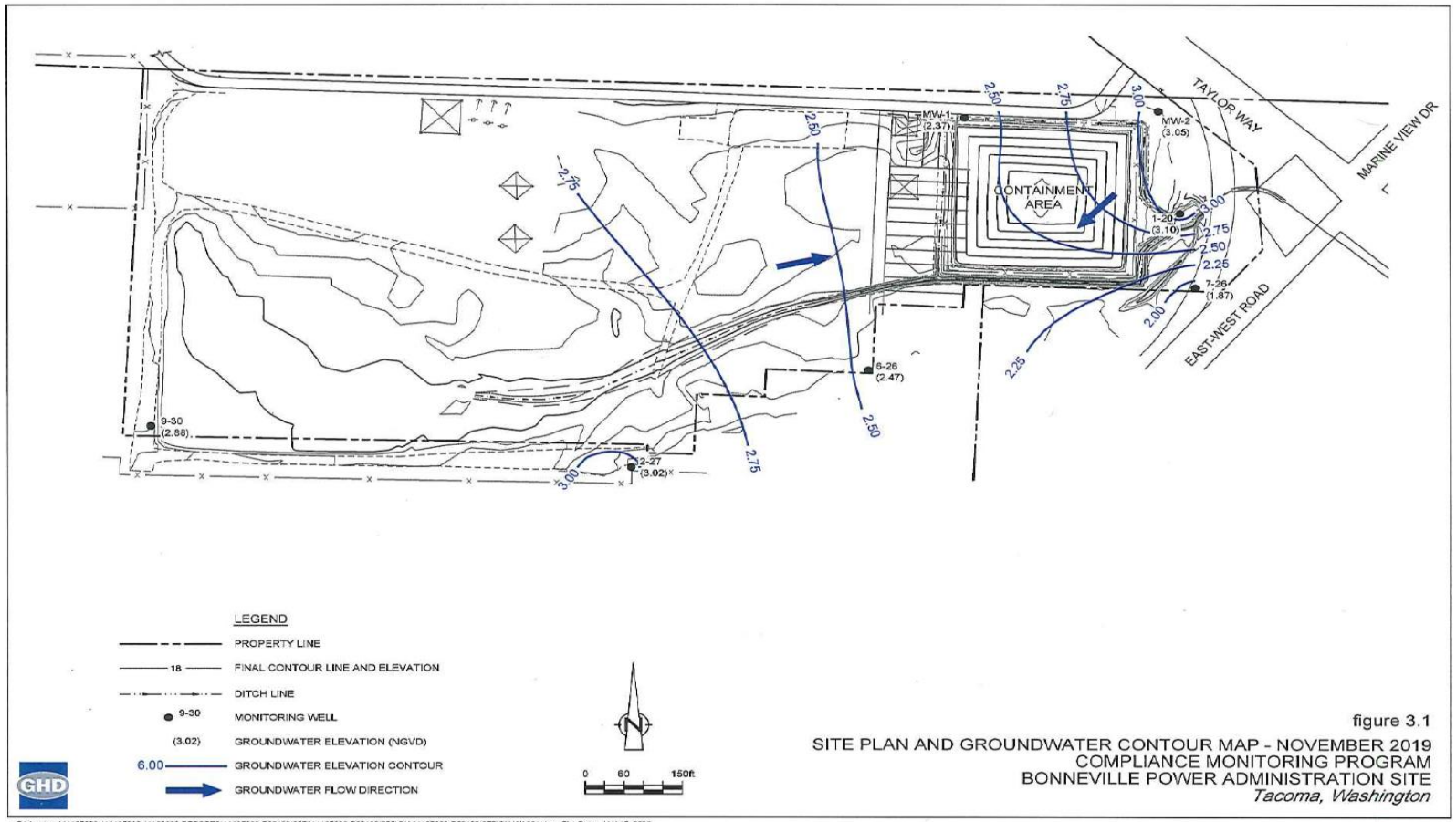

figure 3.1
SITE PLAN AND GROUNDWATER CONTOUR MAP - NOVEMBER 2019
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION SITE
Tacoma, Washington

P:\drawings\11195000s\11195900\11195900-REPORTS\11195900-D23102(055)\11195900-D23102(055)GN\11195900-D23102(055)GN-WA001.dwg Plot Date: JAN 17, 2020

ENCLOSURE – C

Corrected DCE Concentrations Graphs and Table of Results

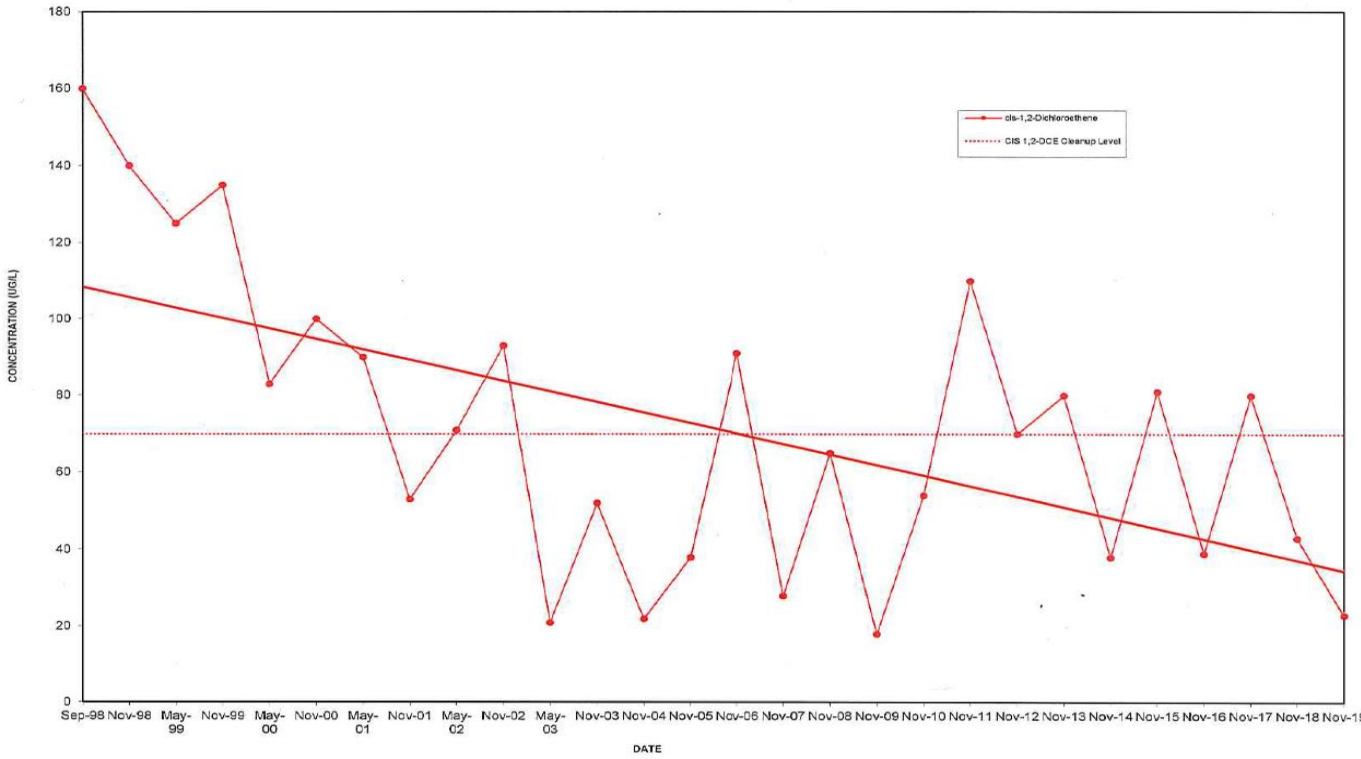

figure 4.1B

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

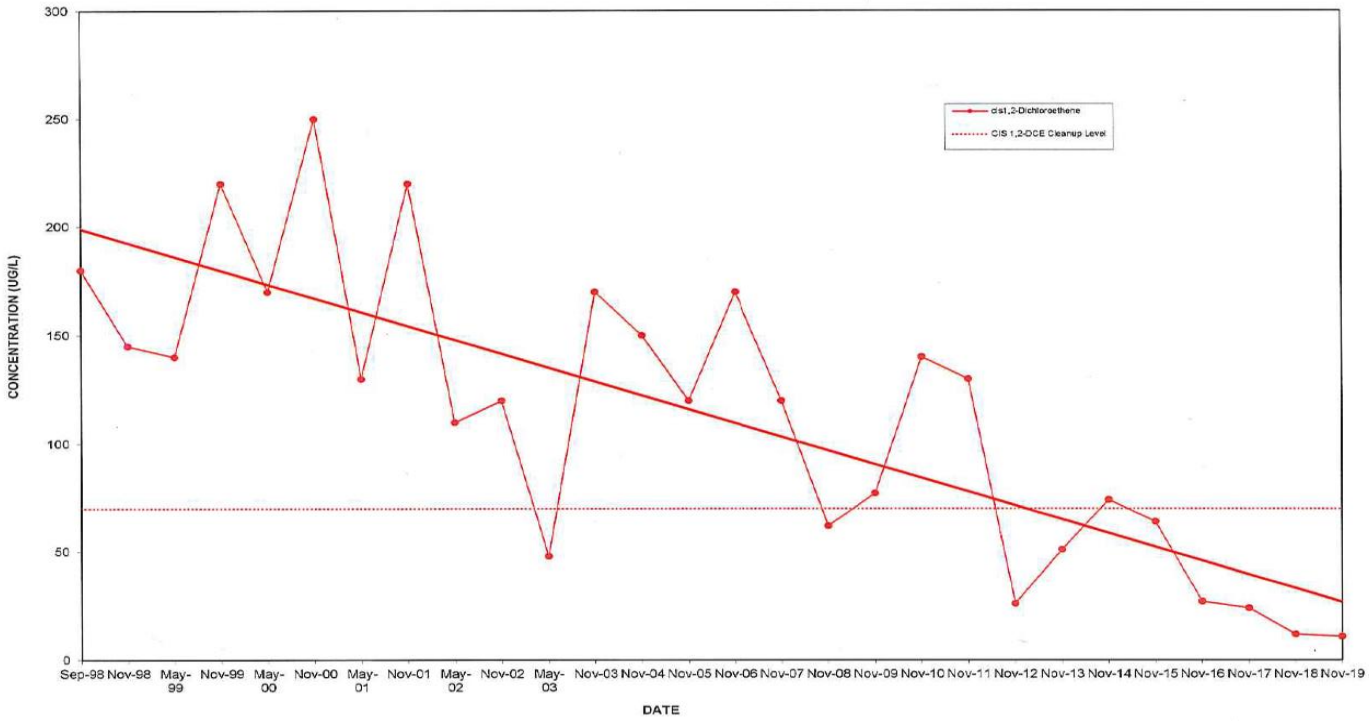

figure 4.2B

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[1]			
Volatile Organic Compounds					
cis-1,2-Dichloroethene	µg/L	70	43	12	12
Methylene chloride	µg/L	5	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	5	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	5	2.5 U	0.21J	2.5 U
Vinyl chloride	µg/L	10*	0.5 U	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

535 Dock Street
Suite 213
Tacoma, WA 98402
Phone (253) 383-2429
chb@healthybay.org
www.healthybay.org

May 21, 2020

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,

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

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.

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.

Sincerely,

Erin Dilworth
Policy & Technical Program Manager

Melissa Malott
Executive Director