

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:

The Boeing Company
Boeing Commercial Airplanes
Everett Plant
3003 West Casino Road
Everett, WA 98203

FIFTH AMENDMENT TO
AGREED ORDER

No. DE 96HS-N274

TO: The Boeing Company
EHS Remediation Director
Steven Shestag
Mail code: 055-T487
5800 Woolsey Canyon Road
Canoga Park, CA 91304

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I. INTRODUCTION

Agreed Order No. DE 96HS-N274 (Order) entered into by the Department of Ecology (Ecology) and The Boeing Company (Boeing) on February 12, 1997, as amended on October 22, 1998 (First Amendment), July 26, 2004 (Second Amendment), July 27, 2006 (Third Amendment), and January 24, 2008 (Fourth Amendment), (collectively referred to as the Amendments) requires that Boeing perform a Remedial Investigation, Feasibility Study (RI/FS) and certain interim actions at the Boeing Commercial Airplanes, Everett Plant (Facility).

By this Fifth Amendment to Agreed Order No. DE 96HS-N274 (Fifth Amendment), Ecology requires Boeing to perform the following two phases of an additional interim action to address the trichloroethylene (TCE) groundwater plume in the Powder Mill Gulch area of the Facility: (1) design, construct, operate, monitor effectiveness, optimize, and maintain a hydraulic containment system to prevent to the maximum extent practicable further migration of the chlorinated solvent contaminated groundwater plume beyond Seaway Boulevard, and to reduce to the maximum extent practicable, chlorinated solvent contaminated groundwater migration to Powder Mill Creek, south of Seaway Boulevard; and (2) design, construct, operate, monitor effectiveness, optimize, and maintain a groundwater hydraulic containment system or other engineered system to reduce to the maximum extent practicable, chlorinated solvent contaminated groundwater migration to Powder Mill Creek, north of Seaway Boulevard.

This Fifth Amendment does not attempt to recite all of the provisions of the Order or the Amendments. Provisions of the Order or the Amendments not specifically addressed in the Fifth Amendment remain in full force and effect.

By entering into this Fifth Amendment, Boeing makes no admissions of fact or law.

II. JURISDICTION

This amendment to the Order is issued pursuant to the authority of RCW 70.105D.050 (1) and WAC 173-303-64630.

III. FINDINGS OF FACT

The Order, Section IV. (Findings of Fact), is hereby amended to incorporate the following Findings of Fact, without admission or agreement of the accuracy or completeness of such facts by Boeing:

1. Work performed under the Agreed Order, Second and Third Amendments confirmed and further delineated the extent of dangerous constituents at and/or from the Facility, including chlorinated solvents in groundwater within the Esperance Sand Aquifer, and chlorinated solvents in surface waters and sediments of Powder Mill Creek. As documented in the Boeing Everett Quarterly Groundwater Monitoring Reports, hazardous substances previously detected in the Esperance Sand Aquifer on and off Boeing Everett property above applicable Model Toxics Control Act (MTCA) groundwater cleanup levels are tetrachloroethylene (PCE), TCE and vinyl chloride (VC). Concentrations of TCE (up to 2,700 ppb), cis-1, 2-dichloroethylene (1, 2-DCE) (up to 52 ppb) and VC (up to 0.7 ppb) were detected in groundwater at points between the area directly downgradient of the Boeing Everett stormwater detention basin and Seaway Boulevard. Concentrations of TCE (up to 1,900 ppb), cis-1, 2-DCE (up to 22 ppb) and VC (up to 21 ppb) were detected in groundwater at points upward of 1,600 feet north of the Boeing Everett property boundary. TCE groundwater contamination has migrated off Boeing property onto City of Everett, Intermec and CRISTA Ministry properties. Detected TCE and VC groundwater concentrations that delineate the plume on and off Boeing Everett property are all above MTCA Method B cleanup levels for potable groundwater, which levels were used as screening levels during the course of the Remedial Investigation. As

documented in Boeing Everett Quarterly and Annual Powder Mill Gulch Groundwater Monitoring Reports through 2010, TCE above applicable MTCA Method B surface water cleanup levels have been detected in Powder Mill Creek. TCE has been detected in Powder Mill Creek surface water since sampling began in 1998, at concentrations up to 38 ppb on the Boeing Everett property and up to 26 ppb on City of Everett property. In 2005 through 2009, TCE was also detected in seeps discharging to Powder Mill Creek at concentrations up to 530 ppb north of the Boeing Everett property. These detected TCE concentrations in surface water and seeps are above the MTCA Method B surface water cleanup level, which level was used as a screening level during the course of the RI.

2. Ecology has not established site specific cleanup levels protective of human health and the environment at the Facility for the interim or final cleanup action for volatile organic compounds in the Esperance Sand aquifer, or surface water within, Powder Mill Creek.

IV. ECOLOGY DETERMINATIONS

The Order, Section V. (Ecology Determinations), is hereby amended to incorporate the following determinations:

1. Ecology has determined that additional work in the form of a certain interim action, as described herein, is necessary.

2. Ecology believes this additional work to be performed is in the public interest.

3. Based on all information known to Ecology, Ecology has determined that the additional interim action required by this Fifth Amendment is necessary to reduce a threat to human health or the environment by substantially reducing one or more pathways for exposure, to correct a problem that may become substantially worse or cost substantially more to address if remedial action is delayed, and to help provide for completion of an RI/FS or design of a cleanup action. WAC 173-340-430(1).

4. Ecology has determined that the additional interim action will not foreclose alternatives for cleanup to be considered in the FS.

5. RCW 70.105D.030(2)(a) requires that, at a minimum, this Fifth Amendment be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Fifth Amendment should public comment disclose facts or considerations which indicate to Ecology that the Fifth Amendment is inadequate or improper in any respect.

V. AMENDMENTS

A. Section VI. of the Order (Work to be Performed) is Amended

The Order, Section VI. (Work to be Performed), is hereby amended to authorize the proposed interim action and incorporate the following information and requirements:

1. Powder Mill Gulch Downgradient Plume Interim Action:

a. Location of interim action. The location of the interim action work is illustrated in Exhibit A. The interim action is divided into two phases. The first phase addresses the plume south of Seaway Boulevard and the second phase addresses the plume north of Seaway Boulevard. This attachment is an integral and enforceable part of this Order.

b. Scope of Work. The scope of work for the interim action authorized under this Fifth Amendment is set forth in Exhibit B. This attachment is an integral and enforceable part of this Order.

Upon Ecology's review and approval of the first and second phase interim action work plans and SEPA checklists, and completion of the required public notification periods, Boeing shall then be required to perform the interim action in accordance with any applicable Ecology-approved documents generated pursuant to the Schedule below and subject to the terms and conditions of this Fifth Amendment.

c. Schedule. Exhibit C identifies the timeline of deliverables required for each phase of the interim action. This attachment is an integral and enforceable part of this Order.

2. Compliance with Applicable Laws

All actions carried out by Boeing pursuant to this Fifth Amendment shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090. The permits or specific federal, state or local requirements that Ecology has determined are applicable and that are known at the time of entry of this Amendment, and Boeing has to obtain, have been identified in Exhibit D. Pursuant to RCW 70.105D.090(1), Boeing is exempt from the procedural requirements of RCW 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 and of any laws requiring or authorizing local government permits or approvals. However, Boeing shall comply with the substantive requirements of such permits or approvals. The permits or specific federal, state or local requirements that are applicable and the exempt permits or approvals and the applicable substantive requirements of those permits or approvals, as they are known at the time of entry of this Fifth Amendment, shall be identified in the deliverables submitted to Ecology, which shall become a part of this Order.

Boeing has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the interim action under this Fifth Amendment. In the event either Ecology or Boeing determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the interim action under this Fifth Amendment, it shall promptly notify the other party of its determination. Ecology shall determine whether Ecology or Boeing shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, Boeing shall promptly consult

with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the interim action. Ecology shall make the final determination on the additional substantive requirements that must be met by Boeing and on how Boeing must meet those requirements. Ecology shall inform Boeing in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Fifth Amendment. Boeing shall not begin or continue the interim action potentially subject to the additional requirements until Ecology makes its final determination.

Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency which is necessary for the state to administer any federal law, the exemption shall not apply and Boeing shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

B. Section VI. of the Order (Work to be Performed) is Amended to Add a Requirement

The Order, Section VI. (Work to be Performed), is hereby amended to add the following:

16. If, at any time after the first exchange of comments on drafts, Ecology determines that insufficient progress is being made in the preparation of any of the deliverables required by this section, Ecology may complete and issue the final deliverable.

C. Section VII. of the Order (Terms and Conditions of Order), is Amended to Add Requirements

The Order, Section VII. (Terms and Conditions of Order), is hereby amended to add the following requirements:

15. Sampling

With respect to the implementation of this Order, Boeing shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section VI. (Work to be Performed), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, Boeing shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by Boeing pursuant to implementation of this Order. Boeing shall notify Ecology seven (7) days in advance of any sample collection or work activity at the Facility required by this amendment. Ecology shall, upon request, allow Boeing and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Order, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section VII.7 (Access), Ecology shall notify Boeing prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under WAC 173-50 for the specific analyses to be conducted, unless otherwise approved by Ecology.

16. Financial Assurance for Corrective Action

a. Financial assurance for corrective action is required by WAC 173-303-64620. Ecology's Financial Assurance Officer shall determine when Boeing's actions and submissions meet the requirements of WAC 173-303-64620.

b. Boeing must submit the original executed or otherwise finalized financial assurance instruments or documents to Ecology's Financial Assurance Officer; facsimiles or photocopies are not acceptable to meet this requirement. In addition, Boeing must also submit copies of financial assurance instruments or documents to Ecology's Project Coordinator. Any request for a deadline extension must meet the requirements of the Order, Section VII.(14) (Extension of Schedule), as amended.

c. Unless otherwise specified, the definitions and requirements for allowable financial assurance mechanisms set forth in the current financial assurance rules covering closure and post-closure (40 C.F.R. 264.141, 40 C.F.R. 264.142, 40 C.F.R. 264.143, 40 C.F.R. 264.145, 40 C.F.R. 264.148, 40 C.F.R. 264.151, and WAC 173-303-620) will be the definitions and requirements for allowable financial assurance for corrective action under this Order. It is the intention of the Parties that these definitions and requirements will apply to this corrective action, and the term "corrective action" is hereby substituted for the terms "closure," "post closure," "post-closure," or "postclosure" in the above listed regulations as needed to produce this result.

d. In the absence of final federal regulations governing financial assurance for corrective action, Ecology's Financial Assurance Officer will use the following resources as guidance:

i. The Financial Assurance for Corrective Action Proposed Rule, 51 Fed. Reg. 37853 (Oct. 24, 1986);

ii. The financial assurance provisions of Corrective Action for Releases from Solid Waste Management Units Advance Notice of Proposed Rulemaking, 61 Fed. Reg. 19432 (May 1, 1996);

iii. The Interim Guidance on Financial Responsibility for Facilities Subject to RCRA Corrective Action (U.S. EPA, September 30, 2003); and/or

iv. Any other guidance applicable to financial assurance and corrective action that may be available at the time.

The financial assurance provisions of the Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities, 55 Fed. Reg. 30798 (July 27, 1990), may be used as secondary guidance at the discretion of Ecology. Unless otherwise specified herein, where the language of this Order conflicts with these rules, proposed rules, notices, and guidance documents, the language of this Order shall prevail.

e. Within thirty (30) days from the effective date of this Order Amendment (the Fifth Amendment), Boeing shall submit to Ecology for review and approval a written cost estimate to cover cleanup activities within the Facility, including completion of the final feasibility study, completion of interim actions, submission of a draft CAP, implementation of the final CAP, and post cleanup monitoring at the Site. If Ecology rejects Boeing's cost estimate as submitted, Ecology shall provide to Boeing a revised cost estimate amount that will be the approved cost estimate. Ecology will, if requested by Boeing in writing, provide a written explanation of the variance between Boeing's proposed cost estimate and Ecology's approved cost estimate. Within thirty (30) days after Ecology's final approval of Boeing's cost estimate amount or Boeing's receipt of Ecology's approved cost estimate amount, Boeing shall establish and maintain continuous coverage of financial assurance in the amount of the approved cost estimate and submit the applicable financial assurance documentation. If Ecology does not accept, reject, or revise Boeing's cost estimate within sixty (60) days after submittal, Boeing's cost estimate will be deemed approved for purposes of this paragraph. Ecology reserves

the right to review and revise Boeing's cost estimate after the 60-day review period. If Ecology revises Boeing's cost estimate after the 60-day review period, Boeing will have thirty (30) days after the revision to provide an updated financial assurance instrument.

f. A revised cost estimate will be submitted by Boeing if, under this Order, Boeing is required to submit additional work plan(s) or to conduct activities related to corrective action not previously part of the original cost estimate and the cost estimate of the additional work plan(s) or corrective action is individually or collectively ten percent or more of the most recent approved total cost estimate for the Facility corrective action. The process outlined in paragraph (e) shall be used to submit a revised cost estimate. If required, the revised cost estimate shall be submitted to Ecology within thirty (30) days of Ecology's approval of the submission of any additional work plan(s) or additional corrective action.

g. If Boeing believes that the estimated cost of work to complete activities under this Order has diminished below the amount covered by existing financial assurance provided under this Order, Boeing may submit a written proposal to Ecology to reduce the amount of the financial assurance provided under this Section so that the amount of the financial assurance is equal to the estimated cost of the remaining work to be performed. The written proposal shall specify, at a minimum, the cost the remaining work to be performed and the basis upon which such cost was calculated. If Ecology decides to accept such a proposal, Ecology shall notify Boeing of its decision in writing. After receiving Ecology's written decision, Boeing may reduce the amount of financial assurance only in accordance with and to the extent permitted by such written decision. Within thirty (30) days after receipt of Ecology's written decision, Boeing shall submit the applicable financial assurance documentation per paragraph (b). No change to the

form or terms of any financial assurance provided under this Section, other than a reduction in amount, is authorized under this paragraph.

h. All cost estimates must be based on the costs to the owner or operator of hiring a third party to complete the work. A third party is neither a parent nor a subsidiary of Boeing. On a case-by-case basis, Ecology may also determine that a company which shares a common higher-tier corporate parent or subsidiary might not qualify as a third party. A cost estimate may not incorporate any salvage value that may be realized with the sale of wastes, facility structures or equipment, land, or other assets associated with the facility. Boeing may also not incorporate a zero cost for wastes that might have economic value.

i. Boeing shall annually adjust all cost estimates for inflation. Adjustments for inflation shall be calculated in accordance with the procedure outlined in 40 C.F.R. § 264.142(b).

j. Acceptable financial assurance mechanisms are trust funds, surety bonds, letters of credit, insurance, the financial test, and the corporate guarantee. Ecology may allow other financial assurance mechanisms if they are consistent with the laws of Washington and if Boeing demonstrates to the satisfaction of Ecology that those mechanisms provide adequate financial assurance.

k. If Boeing is using the financial test or corporate guarantee to meet its financial assurance obligation, the annual inflationary adjustment shall occur within ninety (90) days after the close of Boeing's fiscal year. If Boeing is using any mechanism other than the financial test or corporate guarantee, this adjustment shall occur each year within thirty (30) days after the anniversary of the effective date of this Order Amendment (the Fifth Amendment).

1. If Boeing seeks to establish financial assurance by using a surety bond for payment or a letter of credit, Boeing shall at the same time establish and thereafter maintain a standby trust fund acceptable to Ecology into which funds from the other financial assurance instrument can be deposited, if the financial assurance provider is directed to do so by Ecology, pursuant to the terms of this Order.

m. Boeing shall notify Ecology's Project Coordinator and Financial Assurance Officer by certified mail of the commencement of a voluntary or involuntary bankruptcy proceeding, naming Boeing as debtor, within ten (10) days after commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if it is named as debtor as required under the terms of the corporate guarantee.

n. Once Boeing has established financial assurance with an acceptable mechanism as described above, Boeing will be deemed to be without the required financial assurance:

- i. In the event of bankruptcy of the trustee or issuing institution; or
- ii. If the authority of the trustee institution to act as trustee has been suspended or revoked; or
- iii. If the authority of the institution issuing the surety bond, letter or credit, or insurance policy has been suspended or revoked.

In the event of bankruptcy of the trustee or a suspension or revocation of the authority of the trustee institution to act as a trustee, Boeing must establish a replacement financial assurance mechanism by any means specified in WAC 173-303-620 or other financial instrument as approved by Ecology within sixty (60) days after such an event.

- o. Ecology's Financial Assurance Officer is:

Kimberly Goetz
Department of Ecology
Hazardous Waste and Toxics Reduction Program
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-6754
Fax: (360) 407-6715
Email: kgoe461@ecy.wa.gov

17. Indemnification

Boeing agrees to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action for death or injuries to persons or for loss or damage to property arising from or on account of acts or omissions of Boeing, its officers, employees, agents, or contractors in entering into and implementing this Order. However, Boeing shall not indemnify the state of Washington nor save nor hold its employees and agents harmless from any claims or causes of action to the extent arising out of the negligent acts or omissions of the state of Washington, or the employees or agents of the State, in entering into or implementing this Order.

18. Endangerment

In the event Ecology determines that any activity being performed at the Site is creating or has the potential to create a danger to human health or the environment on or surrounding the Site, Ecology may direct Boeing to cease such activities for such period of time as it deems necessary to abate the danger. Boeing shall immediately comply with such direction.

In the event Boeing determines that any activity being performed at the Site is creating or has the potential to create a danger to human health or the environment, Boeing may cease such activities. Boeing shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon

Ecology's direction Boeing shall provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with Boeing's cessation of activities, it may direct Boeing to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this Section, Boeing's obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended in accordance with Section VII.14 of the Agreed Order (Extension of Schedule) for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Order shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

D. Section VII. of the Order (Terms and Conditions of Order) is Amended

1. The Order, Section VII.10.B (Dispute Resolution), is hereby amended to change the following requirement:

“Section Manager” shall replace “Program Manager”.

2. The Order, Section VII.7 (Access) is hereby amended to replace lines 20 through 27 on page 26 of the Order with the following:

and work area health and safety precautions. If Ecology or its representatives seek to perform their duties at the facility in a manner which is not in compliance with any written plant or work area health and safety requirement or rule, or any applicable federal or state law or promulgated regulation, The Boeing Company's Project Coordinator or other representative may verbally notify such Ecology representative(s) of the non-compliance. Ecology shall ensure that its employees, contractors, and other representatives comply with all applicable federal or state

law and regulations, and with all plant and work area health and safety plans that the Project Coordinators work out in advance. Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Facility property access.

Effective date of this Fifth Amendment: 4/26/11

THE BOEING COMPANY, by, through,
and for its BOEING COMMERCIAL
AIRPLANE GROUP - EVERETT PLANT



Yolanda Bledsoe

Director, Boeing EHS Finance

Date: 12/6/10

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY



Julie Sellick

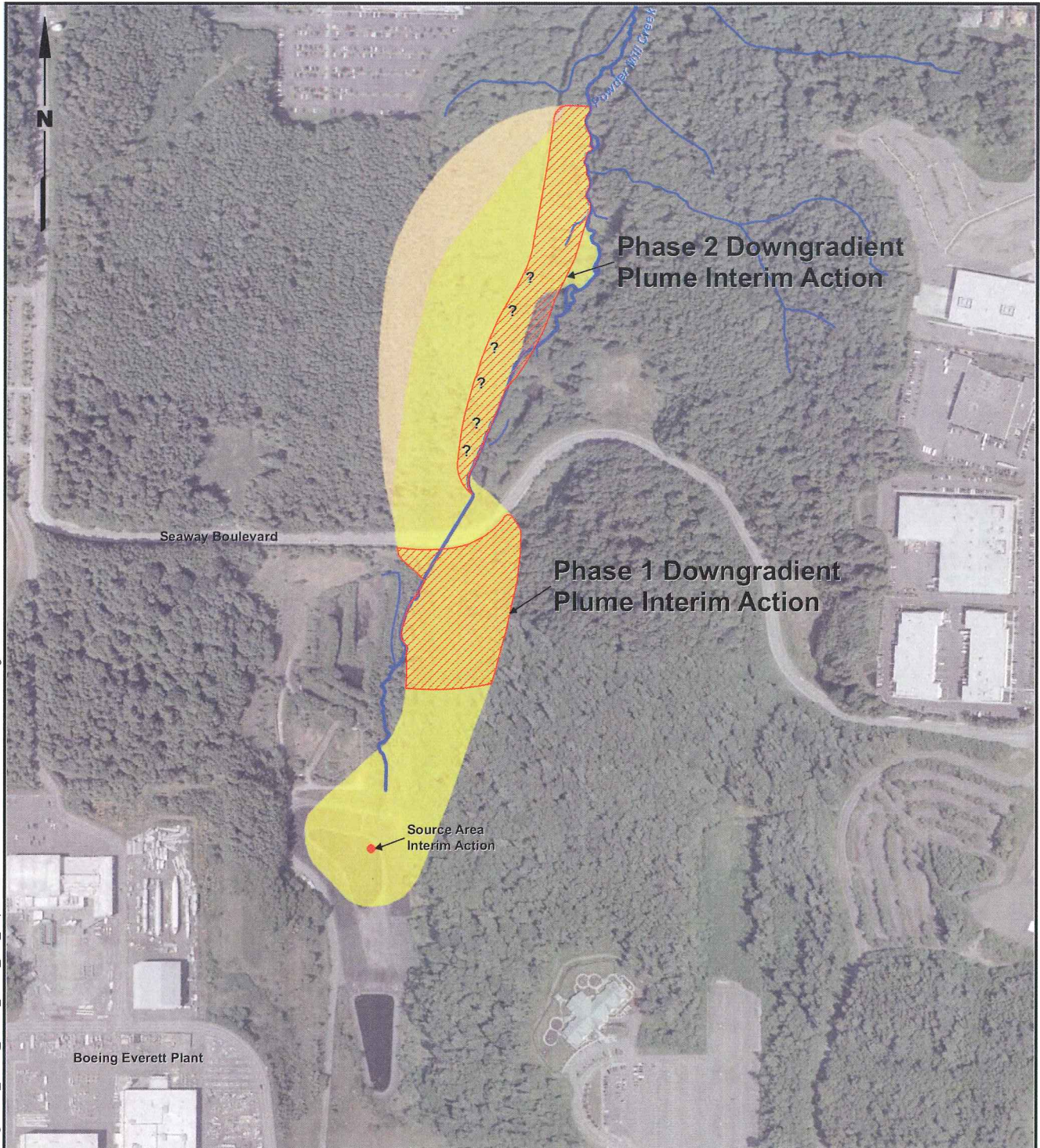
Section Manager
Hazardous Waste and Toxics Reduction
Northwest Regional Office

Date: 4/26/11

EXHIBIT A

Figure: Location of Phase One and Phase Two of the PMG Downgradient Plume Interim Action

Y:\Projects\025175\011\mapdocs\PMG_Downgradient_Plume_Interim_Action_Site_Map.mxd 4/27/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

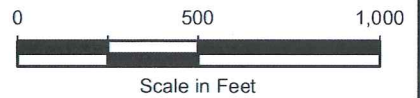


Legend

- Inferred Area with TCE Concentration in Groundwater > 5 µg/L
- Inferred Area with TCE Concentration in Groundwater >0.49 µg/L and < 5 µg/L

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Boeing Commercial Airplanes
Everett Plant

**PMG Downgradient Plume
Interim Action Site Map**

Exhibit
A

EXHIBIT B

Interim Action Scope of Work

A. Objectives of the Interim Action

The objectives of the first phase of the interim action (referred to hereafter as the “Phase One Interim Action”) are to: (a) establish hydraulic containment and prevent further migration to the maximum extent practicable of chlorinated solvent contaminated groundwater beyond Seaway Blvd; and (b) reduce to the maximum extent practicable, migration of chlorinated solvent contaminated groundwater to the surface waters of Powder Mill Creek, south of Seaway Blvd as defined in Exhibit A. The objective of the second phase of the interim action (referred to hereafter as the “Phase Two Interim Action”) is to reduce to the maximum extent practicable, migration of chlorinated solvent contaminated groundwater to the surface waters of Powder Mill Creek, north of Seaway Blvd as defined in Exhibit A. By reducing concentrations of chlorinated solvent contaminated groundwater before entering Powder Mill Creek, the two phases of this interim action will meet an additional objective of further minimizing human and ecological exposures to the contaminated Powder Mill Creek surface water.

B. Phase One Interim Action

1. Submittal of Phase One Interim Action Work Plan

As part of the Phase One Interim Action, Boeing shall submit a work plan to design, construct, operate, monitor effectiveness, optimize, and maintain a hydraulic containment system to prevent further migration of the chlorinated solvent contaminated groundwater plume in Powder Mill Gulch, beyond Seaway Blvd AND design, construct, operate, monitor effectiveness, optimize, and maintain a groundwater hydraulic containment system to reduce to the maximum extent practicable, chlorinated solvent contaminated groundwater migration to Powder Mill Creek, south of Seaway Blvd.

The Phase One Interim Action Work Plan shall include the following elements:

- A description of how the interim action meets the criteria listed in WAC 173-340-430 (7) and (8).
- At a minimum, include the following: engineering documents, reports and drawings; dangerous waste and residual management procedures; construction plans and specifications; operation and maintenance plans and procedures; testing plans and procedures; construction and reporting schedules; plans for post-construction monitoring; and project implementation and submittal/reporting schedule/timelines.
- At a minimum, include the following technical elements: an adequacy review¹ of the pertinent site data, site conceptual model, and interim action objectives; definition of a site-specific three dimensional target hydraulic capture zone(s); interpret pre-interim action water levels and a provision for routine water level interpretation after the interim action system start up using potentiometric surface maps (horizontal), water level difference maps (vertical), and water level pairs (gradient control points to demonstrate inward flow and hydraulic control); estimation of groundwater pumping flow rates needed to meet the interim action objectives and maintain the hydraulic control over the identified hydraulic capture zone(s); capture zone width calculations (including an uncertainty analysis) to demonstrate interim action objectives will be met; plans for evaluation of groundwater and surface water chemical concentration trends to demonstrate that the interim action objectives are met; technical approach, and methods, and plans for characterization of the actual capture zones based on the technical elements

¹ An adequacy review will include a review and discussion of all adequate hydrogeological, chemical and other data that are available to: (a) delineate the CVOC groundwater plume; (b) perform capture zone calculation; and (c) develop a site conceptual model (not numerical model).

discussed above; and the data assessment approach used to compare the target hydraulic capture zone(s) with the actual capture zones and to address identified uncertainties and data gaps.

2. *Submittal of the Phase One Interim Action Effectiveness Review*

As a result of the Phase One Interim Action, Ecology expects to see, at a minimum, significant decreases in chlorinated solvent concentrations in groundwater adjacent to the creek.

Boeing will submit a Phase One Interim Action Effectiveness Review to determine if the objectives for the Phase One Interim Action are, or will be, met in a reasonable timeframe. This shall be demonstrated by groundwater chemical data gathered from the existing monitoring well network and appropriately located and installed groundwater monitoring wells in the target hydraulic capture zone and near the creek and other hydraulic data that shows a significant reduction of contaminants in groundwater being discharging to the creek. Groundwater chemical and hydraulic data from the area downgradient of the remediation system will also be collected and used as lines of evidence to assess the effectiveness of the phase one interim action in preventing further migration of the groundwater contaminant plume beyond Seaway Blvd.

The Phase One Interim Action Effectiveness Review shall include the following elements at a minimum:

- A description of how the groundwater and surface water chemical data and groundwater flow data is used to evaluate the effectiveness of the Phase One Interim Action, achievement of the Phase One Interim Action objectives, and if necessary determine the need for implementation of interim action system optimization. This will include, if necessary, plans for installation of new groundwater monitoring wells and sampling of groundwater to gain the necessary data.

- A discussion of optimization options if it is determined that the hydraulic containment at Seaway Blvd is not effective in meeting the Phase One Interim Action objectives. These optimization options shall, at a minimum, consider: the need to reduce or increase groundwater extraction rates; an increase in the number of groundwater extraction wells; modification of the locations of the groundwater extraction wells; additional groundwater seep monitoring; and the need for additional monitoring well installations.

3. *Submittal of an Interim Action Optimization Work Plan (If Required by Ecology)*

If Ecology determines that the objectives for the Phase One Interim Action are not being met in a reasonable timeframe, then Boeing shall submit an interim action optimization work plan with implementation schedule. Ecology will give the basis for its assertion that the objectives are not being met in a reasonable timeframe. In order to meet the objectives of the interim action in a reasonable timeframe, the optimization work plan shall consider, at a minimum: increases or decreases in groundwater extraction rates at one or more of the groundwater extraction wells, additional groundwater extraction wells, additional and relocation of existing groundwater extraction wells and additional groundwater seep sampling. The work plan shall include a timeline for work activities and document submittals to Ecology. Once approved by Ecology, Boeing shall implement the optimization work plan.

C. Phase Two Interim Action

1. *Ecology Determination Letter Regarding Additional Target Area*

Ecology will determine whether Boeing must include an additional interim action target area that includes sections of the chlorinated solvent plume between Seaway Blvd and the northern portion (the toe) of the off-property groundwater plume in the Phase Two Interim Action. This

decision will be based on the results of on-going groundwater remedial investigation activities. Ecology shall explain in writing the basis for its determination.

2. *Submittal of the Phase Two Interim Action Data Collection Work Plan*

Boeing shall identify the data and information collection activities necessary to design, construct, operate, monitor effectiveness, optimize, and maintain a groundwater hydraulic containment system or other equally effective system to reduce to the maximum extent practicable, chlorinated solvent contaminated groundwater migration to Powder Mill Creek, north of Seaway Blvd (i.e., the phase two interim action). The work plan shall include a time schedule for completion of data collection, including submittal of a report to Ecology.

3. *Submittal of the Phase Two Interim Action Data Collection and Conceptual Design Report*

In this report, Boeing shall summarize the data and information collected and will identify at least three (3) remedial technology alternatives for the Phase Two Interim Action. The report will identify Boeing's recommended treatment technology and a conceptual design. Boeing will also explain how the data and information collected supports selection of Boeing's recommended treatment technology. Ecology will review and approve the report.

4. *Submittal of the Phase Two Interim Action Work Plan*

Boeing shall submit a work plan to design, construct, operate, monitor effectiveness, optimize, and maintain a groundwater hydraulic containment system or other engineered system to reduce to the maximum extent practicable chlorinated solvent contaminated groundwater migration to Powder Mill Creek, north of Seaway Blvd.

The Phase Two Interim Action Work Plan shall include the following elements:

- A description of how the interim action meets the criteria listed in WAC 173-340-430 (7) and (8).

- A clear description of the measured metrics that will be used to determine that all objectives of the interim action are met.
- At a minimum, include the following: engineering documents, reports and drawings; dangerous waste and residual management procedures; construction plans and specifications; operation and maintenance plans and procedures; testing plans and procedures; construction and reporting schedules; plans for post-construction monitoring; and project implementation and submittal/reporting schedule/timelines.
- At a minimum, include the following technical elements: an adequacy review² of the pertinent site data, site conceptual model, and interim action objectives; definition of a site-specific three dimensional target zone(s); interpretation of pre-interim action water levels and a provision for routine water level interpretation after the interim action system start up using potentiometric surface maps (horizontal), and water level difference maps (vertical) as needed; plans for evaluation of groundwater and surface water chemical concentration trends to demonstrate that the interim action objectives are met; plans for routine interpretation of actual system results based on the technical elements discussed above, comparison to the target, system performance and assessment of uncertainties and data gaps; and other design parameters needed to meet the interim action objective.

5. *Submittal of the Phase Two Interim Action Effectiveness Review*

As a result of the Phase Two Interim Action, Ecology expects to see, at a minimum, a significant decrease in chlorinated solvent concentrations in groundwater adjacent to the creek.

² An adequacy review will include a review and discussion of all adequate hydrogeological, chemical and other data that are available to: (a) delineate the CVOC groundwater plume; (b) perform capture zone calculation (or other pertinent calculations for the selected technology); and (c) develop a site conceptual model (not numerical model).

Boeing will submit a Phase Two Interim Action Effectiveness Review to determine if the objectives for the Phase Two Interim Action are, or will be, met in a reasonable timeframe. This shall be demonstrated by groundwater chemical data gathered from appropriately located and installed groundwater monitoring wells near the creek and other hydraulic data that shows a significant reduction of contaminants in groundwater being discharged to the creek.

The Phase Two Interim Action Effectiveness Review shall include the following elements at a minimum:

- A description of how the groundwater and surface water chemical data and groundwater flow data is used to evaluate the effectiveness of the Phase Two Interim Action, achievement of the Phase Two Interim Action objectives, and if necessary determine the need for implementation of interim action system optimization. This will include, if necessary, plans for installation of new groundwater monitoring wells and sampling of groundwater to gain the necessary data.
- A discussion of optimization options if it is determined that the system that is implemented is not effective in meeting the Phase Two Interim Action objectives. These optimization options shall, at a minimum, consider: modification of design/construction; additional groundwater seep monitoring; and the need for additional monitoring well installations.

6. *Submittal of an Interim Action Optimization Work Plan (If Required by Ecology)*

If Ecology determines that the objectives for the Phase Two Interim Action are not being met in a reasonable timeframe, then Boeing shall submit an interim action optimization work plan with implementation schedule. Ecology will give the basis for its assertion that the objectives are not being met in a reasonable timeframe. In order to meet the objectives of the

interim action in a reasonable timeframe, the optimization work plan shall consider, at a minimum: modification of design/construction, additional and relocated groundwater monitoring well installation, and groundwater seep sampling. The work plan shall include a timeline for work activities and document submittals to Ecology. Once approved by Ecology, Boeing shall implement this optimization work plan.

D. General Interim Action Requirements:

1. A Quality Assurance Project Plan (QAPP) will be prepared in accordance with the EPA Requirements for Quality Assurance Project Plans, EPA Region 10, QA/R-5; and requirements of the EPA Contract Laboratory Program. The QAPP will also follow Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (July 2004). Examples of completed QAPPs can be found at <http://www.ecy.wa.gov/biblio/qapp.html>. Laboratories must meet the accreditation standards established in WAC 173-50.

2. Submittal of bi-monthly interim action status reports. The Boeing project manager or another appointed Boeing staff member shall submit bi-monthly status reports in electronic and hard copy format which includes the original hand-signed original cover letter per the schedule in Exhibit C. The bi-monthly reports shall include, at a minimum: description of the interim action effectiveness; all work conducted pursuant to this Agreed Order amendment during the last two month period; interim action activities and work planned for the next 1-6 months in accordance with Ecology approved plans; summaries of significant findings; tabulated individual groundwater extraction rates and volumes; groundwater treatment performance data and description of groundwater treatment effectiveness; tabulated treated groundwater discharge rates at respective discharge locations; updated groundwater chemical, groundwater elevation, surface water chemical and surface water elevation data tabulated and presented in contour figures pertinent to evaluating the effectiveness of the interim actions;

occurrence of any problems and how problems were rectified; deviations from the Ecology approved work plans and a written justification for all deviations; summaries of contacts with all federal, state, local community, and public interest groups; changes in key personnel; and all laboratory analyses (as copies of the original laboratory reporting data sheets, in tabulated data format) for which quality assurance procedures were completed during the two month period. All validated data will include a quality assurance and quality control (QA/QC) summary narrative per the Ecology approved QAPP. Boeing shall make best efforts to include groundwater and surface water data collected within the next required progress report.

The frequency of progress report submittals will be changed, if both Ecology and the Boeing Company agree. A change to the frequency of progress report submittals would be considered a minor modification of the Agreed Order that may be agreed to by Ecology and the Boeing Company without public notice and comment.

3. Submittal of draft as-built drawings. The Boeing Company will submit draft as-built drawings and a narrative describing the interim action start-up procedures for Phase One and Phase Two of the Interim Action per the schedule in Exhibit C and in compliance with WAC 173-340-400(5)(b).

4. Submittal of an Annual Summary Report. The annual report may replace the last bi-monthly written status report for that calendar year as long as the requirements of the last bi-monthly report are included in the annual report. The reporting time period for the annual report is January 1st through December 31st or each calendar year. These annual reports shall include at a minimum: narrative discussing the effectiveness of the Phase One and Phase Two Interim Action in meeting their respective objectives; recommendations for work to be conducted in the upcoming year to assist in meeting those objectives; summaries of significant findings; tabulated individual groundwater extraction rates and volumes; tabulated groundwater treatment data prior

to discharge and description of treatment effectiveness; updated groundwater chemical, groundwater elevation, surface water chemical and surface water elevation data tabulated and presented in contour figures pertinent to evaluating the effectiveness of the interim action; tabulated treated groundwater discharge rates at respective discharge locations; discussion of problems encountered and how resolved; description of the disposal and dangerous waste designation processes for wastes generated; summary of all deviations from the Ecology approved work plans and written justification for all deviations and discussion of the fate of the groundwater contaminants after treatment (vented, destroyed, etc). The annual report for Phase One and Phase Two of the Interim Action shall also include at a minimum:

- A time schedule of activities and deliverables to Ecology.
- A description of the effectiveness of Phase One and Phase Two of the Interim Action through the reporting calendar year.
- Boeing and Boeing contractor personnel roles and responsibilities.
- Summary of deviations from the approved work plans, QAPP, sampling and analysis plans (SAPs) and other Ecology approved documents for this interim action.

5. Any field deviations from the approved work plans, QAPP, sampling and analysis plans (SAPs) and other Ecology approved documents for this interim action must be communicated to Ecology immediately and documented in writing.

6. SEPA and Public Participation Requirements. If additional SEPA requirements are necessary after the execution of this Agreed Order Amendment, Boeing shall be responsible for complying with the SEPA Rules and Regulations including preparing and submitting an environmental checklist. If the result of the threshold determination is a determination of significance (DS), Boeing shall be responsible for the preparation of draft and final environmental impact statements. Boeing shall assist Ecology with coordinating SEPA public

involvement requirements with MTCA public involvement requirements whenever possible, such that public comment periods and meetings or hearings can be held concurrently. Boeing shall support Ecology in presenting the interim action reports and SEPA evaluations at any public meetings or hearings necessary for SEPA compliance or as part of the Public Participation Plan.

After the public comment periods are completed, Boeing shall prepare a Draft Responsiveness Summary, if requested by Ecology, that addresses public comments and prepare revised draft work plans or reports as necessary that addresses public comments. If requested by Ecology, Boeing shall prepare two (2) copies of the Draft Responsiveness Summary and revised reports and work plans and submit them to Ecology for review and comment, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for distribution and public comment. After addressing Ecology's comments, Boeing shall prepare five (5) copies of the Final Responsiveness Summary and Final reports and work plans and submit them to Ecology for distribution, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats.

7. Boeing shall revise all interim action documents within thirty (30) calendar days of receipt of all Ecology comments.

EXHIBIT C

Interim Action Schedule

Milestone #	Milestone Description	Date
1	Submit the draft Phase One Interim Action Work Plan	Submit hard copy, electronic copy and original hand signed cover letter to Ecology within 30 calendar days of the effective date of this Fifth Amendment.
2	Implement the Phase One Interim Action Work Plan	Begin construction and implement the Phase One Interim Action Work Plan per the schedule in the Ecology-approved Phase One Interim Action Work Plan.
3	Submit the Phase One Interim Action Effectiveness Review	Within one year after startup of the Phase One Interim Action hydraulic control system, or as directed by Ecology.
4	Submit the Phase One Interim Action Optimization Work Plan with implementation schedule (if required by Ecology)	Submit hard copy, electronic copy and original hand signed cover letter within 30 calendar days of receipt of Ecology's written notification.
5	Implement the Phase One Interim Action Optimization Work Plan (if required by Ecology)	Implement the Phase One Interim Action Optimization Work Plan per the schedule in the Ecology-approved work plan.
6	Ecology Determination Letter Regarding Additional Target Area	At any time prior to submittal of the Phase Two Interim Action Data Collection Work Plan.

Milestone #	Milestone Description	Date
7	Submit the Phase Two Interim Action Data Collection Work Plan	Submit hard copy, electronic copy and original hand signed cover letter within 60-calendar days of Ecology's written approval of the Phase One Interim Action Work Plan or issuance of the Ecology Determination Letter Regarding Additional Target Area, whichever is later.
8	Implement the Phase Two Interim Action Data Collection Work Plan	Implement the Phase Two Interim Action Data Collection Work Plan within 30-calendar days of receipt of Ecology's written approval.
9	Submit the Phase Two Interim Action Data Collection and Conceptual Design Report	Submit the hard copy, electronic copy and original hand signed cover letter of the Phase Two Interim Action Data Collection and Conceptual Design Report per the schedule in the Phase Two Interim Action Data Collection Work Plan.
10	Submit a draft Phase Two Interim Action Work Plan	Submit hard copy, electronic copy and original hand signed cover letter within 90 calendar days of Ecology written approval of the Phase Two Interim Action Data Collection and Conceptual Design Report.
11	Implement the Phase Two Interim Action Work Plan	Begin construction and implement the Phase Two Interim Action Work Plan per the schedule in the Ecology-approved Phase Two Interim Action Work Plan.
12	Submit the Phase Two Interim Action Effectiveness Review	Within one year of startup of the Phase Two Interim Action, or as directed by Ecology.

Milestone #	Milestone Description	Date
13	Submit the Phase Two Interim Action Optimization Work Plan with implementation schedule (if required by Ecology)	Submit hard copy, electronic copy and original hand signed cover letter within 30 calendar days of receipt of Ecology's written notification.
14	Implement the Phase Two Interim Action Optimization Work Plan (if required by Ecology)	Implement the Phase One Interim Action Optimization Work Plan per the schedule in the Ecology-approved work plan.
15	Submit bi-monthly interim action status reports.	Submit hard copy, electronic copy and original hand signed cover letter to Ecology by the 15 th day of every other month and start no later than 60-days after the effective date of this Agreed Order amendment
16	Submit draft as-built drawings and a narrative describing the phase one interim action start-up procedures.	Submit hard copy, electronic copy and original hand signed cover letter within 60-days of completion of the phase one interim action construction and start-up procedures. Notify Ecology in writing within 7 calendar days of completion of Phase One Interim Action construction and start-up.
17	Submit draft as-built drawings and a narrative describing the Phase Two Interim Action start-up procedures.	Submit hard copy and electronic copy and original hand signed cover letter within 60-days of completion of the Phase Two Interim Action construction and start-up procedures. Notify Ecology in writing within 7 calendar days of completion of Phase Two Interim Action construction and start-up.
18	Submit Annual Reports	Submit hard copy, electronic copy and original hand signed cover letter to Ecology no later than March 15 th of every calendar year.

Milestone #	Milestone Description	Date
19	Submit Draft Interim Action Completion and Summary Report	Submit hard copy, electronic copy and original hand signed cover letter to Ecology no later than 60 calendar days after Ecology's written notification that Phase One and Phase Two of the interim action is completed.

EXHIBIT D

Required Permits/Approvals

Laws and regulations addressing permits or federal, state, or local requirements that Ecology believes may be applicable at the time of entry of this Agreed Order amendment are listed below. Work performed shall be in accordance within the substantive requirements of any applicable law or regulation.

1. Chapter 90.48 RCW (State Water Pollution Control Act) and Chapter 173-201A (State Water Quality Rule)
2. Chapter 70.105D RCW (Model Toxics Control Act), and Chapter 173-340 WAC (MTCA Regulations).
3. Chapter 70.105 RCW (Washington State Hazardous Waste Management Act), and Chapter 173-303 WAC (State Dangerous Waste Regulations).
4. Chapter 75.20.100 RCW (Washington Hydraulics Project Approval), and Chapter 220-110 WAC (Hydraulic Code Rules)
5. Chapter 173-160 RCW (Minimum Standards for Construction and Maintenance of Wells).
6. Chapter 43.21C RCW (State Environmental Policy Act), and Chapter 197-11 WAC (State Environmental Policy Act Rules).
7. Washington Industrial Safety and Health Act (WISHA).
8. Clean Water Act Section 404 Permit.
9. Hydraulics Project Approval Permit.
10. City of Everett Public Works (Grading) Permit.
11. City of Everett Building Permit
12. City of Everett Critical Areas Work Authorization
13. Applicable City of Everett Municipal Codes.