

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION X
STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

IN THE MATTER OF:

Lower Duwamish Waterway

Port of Seattle, King County,
City of Seattle, The Boeing Company,

RESPONDENTS

Proceeding Under Sections 104, 122(a),
122(d)(3) of the Comprehensive
Environmental Response, Compensation,
and Liability Act (CERCLA), as amended,
42 U.S.C. §§ 9604, 9622(a), 9622(d)(3) and Under the
Washington State Model Toxics Control Act
(MTCA), ch. 70.105D RCW.

U.S. EPA, Region 10
Docket No. CERCLA-
10-2001-0055

Ecology Docket No.
00TCPNR-1895

ADMINISTRATIVE ORDER ON CONSENT
FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY

I. INTRODUCTION

1. This Administrative Order on Consent (Consent Order) is entered into voluntarily by the United States Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology) as regulatory agencies and the Port of Seattle, King County, City of Seattle, and The Boeing Company, as Respondents. This order is both an Administrative Order on

ADMINISTRATIVE ORDER
ON CONSENT - I



1 Consent under CERCLA and an Agreed Order under MTCA. Unless otherwise specified, the
2 terms "Consent Order" and "Order" as used herein refers to orders issued under both authorities.
3 This Consent Order concerns the preparation of and performance of, and reimbursement of costs
4 incurred by EPA and Ecology in connection with a river-wide Remedial Investigation and
5 Feasibility Study (RI/FS) for the Lower Duwamish Waterway Site in Seattle, Washington.
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7 8 II. JURISDICTION

9 1. This Consent Order is issued under the authority vested in the President of
10 the United States by Sections 104, 122(a), and 122(d)(3) of the Comprehensive Environmental
11 Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9622(a), and
12 9622(d)(3) (CERCLA). This authority was delegated to the Administrator of EPA on January
13 23, 1987, by Executive Order 12580, 52 Fed. Reg. 2926 (1987), and further delegated to
14 Regional Administrators on September 13, 1987, by EPA Delegation No. 14-14-C. This
15 authority has been redelegated by the Regional Administrator to the Region X Director,
16 Environmental Cleanup Division (ECL), and further delegated to ECL Unit Managers
17 thereunder. This order is also issued by Ecology under the authority of RCW 70.105D.050(1).
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19 2. Respondents agree to undertake the actions required by the terms and
20 conditions of this Consent Order. In any action by EPA, the United States, or Ecology to enforce
21 the terms of this Consent Order, Respondents consent to and agree not to contest the authority or
22 jurisdiction of EPA or Ecology to issue or enforce this Consent Order, and agree not to contest
23 the validity of this Order or its terms.
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25 26 27 III. PARTIES BOUND

1 1. This Consent Order shall apply to and be binding upon EPA and Ecology,
2 and shall be binding upon Respondents, their agents, successors, assigns, officers, directors, and
3 principals. Respondents are jointly and severally responsible for carrying out the actions required
4 of them by this Consent Order. The signatories to this Consent Order certify that they are
5 authorized to execute and legally bind the parties they represent to this Consent Order. No
6 change in the ownership or corporate status of any Respondent or of any facility or the Site shall
7 alter Respondents' responsibilities under this Consent Order.

9 2. Respondents shall provide a copy of this Consent Order to any subsequent
10 owners or successors before ownership rights or stock or assets in a corporate acquisition are
11 transferred. Respondents shall provide a copy of this Consent Order to all contractors,
12 subcontractors, laboratories, and consultants which are retained to conduct any work performed
13 under this Consent Order, within fourteen (14) days after the effective date of this Consent Order
14 or the date of retaining their services, whichever is later. Respondents shall condition any such
15 contracts upon satisfactory compliance with this Consent Order. Notwithstanding the terms of
16 any contract, Respondents are responsible for compliance with this Consent Order and for
17 ensuring that their subsidiaries, employees, contractors, consultants, subcontractors, agents, and
18 attorneys comply with this Consent Order.

21 3. No voluntary conveyance or relinquishment of title, easement, leasehold,
22 or other interest in any portion of the Site shall be consummated by Respondents without
23 provision for continued implementation of all requirements of this Order and implementation of
24 any remedial actions found to be necessary as a result of this Order. Prior to transfer of any legal
25 or equitable interest Respondents may have in the Site or any portions thereof, Respondents shall
26 serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other
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1 successor in such interest. At least thirty (30) days prior to finalization of any transfer,
2 Respondents shall notify EPA and Ecology of the contemplated transfer.

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5 IV. STATEMENT OF PURPOSE

6 1. In entering into this Consent Order, the objectives of EPA, Ecology and
7 Respondents are: (a) to determine the nature and extent of contamination and any threat to the
8 public health, welfare, or the environment caused by the release or threatened release of
9 hazardous substances, pollutants, or contaminants at or from the Site, by conducting an RI,
10 including the assembly and evaluation of existing data and identification of possible early
11 actions, and conduct a river-wide FS, in accordance with the Statement of Work (SOW) attached
12 as Attachment A; the FS will determine and evaluate alternatives for remedial action to prevent,
13 mitigate, or otherwise respond to or remedy any release or threatened release of hazardous
14 substances, pollutants, or contaminants at or from the Site; and (b) to recover costs incurred by
15 EPA and Ecology with respect to this Consent Order.

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18 2. The activities conducted under this Consent Order are subject to approval
19 by EPA and Ecology. Respondents shall provide all appropriate necessary information for the
20 RI/FS, in accordance with the SOW, for a CERCLA Record of Decision (ROD) and MTCA
21 Cleanup Action Plan (CAP) that is consistent with CERCLA and the National Oil and Hazardous
22 Substance Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, MTCA and regulations
23 promulgated thereunder, chapters 173-340 and 173-204 WAC, as now or hereafter amended.
24 The activities conducted under this Consent Order shall be conducted in compliance with all
25 applicable EPA and Ecology guidance, policies, and procedures.
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V. FINDINGS OF FACT

EPA and Ecology find the following facts which Respondents neither admit nor deny.

1. The Lower Duwamish Waterway Site (Site) consists of the areal extent of contamination in the Lower Duwamish Waterway. It has served as Seattle's major industrial corridor since it was first created by a widening and straightening of the Lower Duwamish River (and formation of Harbor Island) by the United States Army Corps of Engineers, completed in 1911. Industrial uses of and along the Waterway have been extensive over nearly ninety years. The Waterway is also habitat to numerous fish and other aquatic species, and is a migratory corridor for endangered, threatened, and other anadromous fish.

2. Contaminants found in the waterway include, but are not limited to, polychlorinated biphenyls (PCBs), poly-aromatic hydrocarbons (PAHs), mercury and other metals, and phthalates. The Lower Duwamish Waterway has been the subject of numerous studies by various governmental and private entities which Respondents have agreed to assemble, integrate and evaluate during Phase I of the RI process, as set forth in the attached SOW. Many contaminant releases may have pre-dated the 1970s. Sources of releases include industrial releases, sewer system outfalls and urban run-off from Respondents' facilities.

3. On December 1, 2000, EPA proposed the site for the National Priorities List pursuant to Section 105 of CERCLA, 42 U.S.C. 9605.

4. The Port of Seattle, is a Washington Port District, duly created under RCW Chap. 53. King County is the most populous county in the state of Washington. The City of Seattle is the most populous municipality in the state of Washington. The Boeing Company is a Delaware Corporation doing business in the state of Washington, primarily engaged in aircraft

1 manufacture and aerospace technology. The site encompasses property owned and/or operated
2 by the Port of Seattle, King County and the City of Seattle, and property managed by the Port
3 pursuant to a Port Management Agreement with the Washington Department of Natural
4 Resources.
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6 5. EPA has not performed a Potentially Responsible Party search for the Site.
7 Additional parties may be potentially liable for releases and contamination at the Site.
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9 VI. CONCLUSIONS OF LAW AND DETERMINATIONS
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11 EPA and Ecology make the following conclusions of Law and Determinations
12 which Respondents neither admit or deny:

13 1. The Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C.
14 § 9601(9), and in RCW 70.105D.020(4).
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16 2. Wastes and constituents thereof at the Site, as identified in the preceding
17 Section are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. §
18 9601(14), and in RCW 70.105D.020(7), or constitute "any pollutant or contaminant" that may
19 present an imminent and substantial danger to public health or welfare under Section 104(a)(1) of
20 CERCLA, 42 U.S.C. § 9604(a)(1).
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22 3. The presence of hazardous substances at the Site or the past, present, or
23 potential migration of hazardous substances currently located at or emanating from the Site,
24 constitute actual and/or threatened "releases" as defined in Section 101(22) of CERCLA, 42
25 U.S.C. § 9601(22), and RCW 70.105D.020(20).
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27 4. Each Respondent is a "person" as defined in Section 101(21) of CERCLA,
28 42 U.S.C. § 9601(21), and RCW 70.105D.020(14).
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1 5. Each Respondent is a responsible party under Sections 104, 107, and 122
2 of CERCLA, 42 U.S.C. §§ 9604, 9607, and 9622. By letter dated August 2, 2000, Ecology
3 notified each Respondent of its status as a “potentially liable person” under RCW 70.105D.040,
4 after notice and opportunity for comment.
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6 6. The actions required by this Consent Order are necessary to protect the
7 public health or welfare or the environment, are in the public interest, RCW 70.105D.050(1), are
8 consistent with CERCLA and the NCP, 42 U.S.C. §§ 9604(a)(1), and will expedite effective
9 remedial action and minimize litigation, 42 U.S.C. § 9622(a). Pursuant to RCW 70.105D.080
10 and WAC 173-340-550(5), compliance with this Order in the Department of Ecology’s view is
11 the substantial equivalent of a Department supervised remedial action.
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13 14 VII. ROLE OF REGULATORY AGENCIES

15 1. This Order is issued jointly by EPA and Ecology pursuant to their
16 respective CERCLA and MTCA authorities, and will be jointly managed and overseen by both
17 agencies. The agencies have agreed that written approval from an authorized representative of
18 either agency shall be approval from both agencies, and that such approval shall not be given
19 without the other agency’s pre-authorization or consent.
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21 22 VIII. WORK TO BE PERFORMED

23 1. For purposes of this Order, an RI/FS also means a Cleanup Study Plan
24 under Chapter 173-204 WAC. All work performed under this Consent Order shall be under the
25 direction and supervision of qualified personnel. Within thirty (30) days of the effective date of
26 this Order, and before the work outlined below begins, Respondents shall notify EPA and
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1 Ecology, in writing, of the names, titles, and qualifications of the personnel, including
2 contractors, subcontractors, consultants, and laboratories to be used in carrying out such work.
3 The qualifications of the persons undertaking the work for Respondents shall be subject to EPA
4 and Ecology's review, for verification that such persons meet minimum technical background
5 and experience requirements. This Order is contingent on Respondents' demonstration to EPA
6 and Ecology's satisfaction that Respondents are qualified to perform properly and promptly the
7 actions set forth in this Consent Order. If EPA and Ecology disapprove, in writing, of any
8 person(s)' technical qualifications, Respondents shall notify EPA and Ecology of the identity and
9 qualifications of the replacement(s) within thirty (30) days of the written notice. If EPA and
10 Ecology subsequently disapprove of the replacement(s), EPA and Ecology reserve the right to
11 terminate this Order and to conduct a complete RI/FS, and to seek reimbursement for costs and
12 penalties from Respondents. Respondents reserve the right to dispute EPA or Ecology's attempt
13 to recover such costs. During the course of the RI/FS, Respondents shall notify EPA and
14 Ecology, in writing, of any changes or additions in the personnel used to carry out such work,
15 providing their names, titles, and qualifications. EPA and Ecology shall have the same right to
16 approve changes and additions to personnel as they have hereunder regarding the initial
17 notification.

21 2. Respondents shall conduct activities and submit deliverables as provided
22 in the attached SOW. All such work shall be conducted in accordance with CERCLA, the NCP,
23 MTCA and chapters 173-340 and 173-204 of the Washington Administrative Code (WAC), as
24 now or hereafter amended, and shall be consistent with EPA and Ecology guidance including, but
25 not limited to, the "Interim Final Guidance for Conducting Remedial Investigations and
26 Feasibility Studies under CERCLA" (OSWER Directive # 9355.3-01), "Guidance for Data
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1 Usability in Risk Assessment" (OSWER Directive # 9285.7-05) and guidance referenced therein,
2 as may be amended or modified by EPA and Ecology. The general activities that Respondents
3 are required to perform are identified below, followed by a list of deliverables. The tasks that
4 Respondents must perform are described more fully in the SOW and guidance. Respondents
5 City of Seattle & The Boeing Company shall each have at two points in the RI/FS process a
6 unilateral right to withdraw unilaterally from this Consent Order and decline participating in
7 further work and have no further obligations under this Consent Order. This right to withdraw by
8 each of these Respondents shall occur: 1) at the conclusion of Phase I of the RI as defined in the
9 SOW; and 2) at the conclusion of the RI, including EPA and Ecology's approval of the FS Work
10 Plan. All work performed under this Order shall be in accordance with the schedules herein, and
11 in full accordance with the standards, specifications, and other requirements detailed in the
12 attached SOW and deliverables thereunder, as initially approved or modified by EPA and
13 Ecology, and as may be amended by EPA and Ecology from time to time. For the purposes of
14 this Order, day means calendar day unless otherwise noted in the Order. All Tasks set forth in
15 this Section refer to the SOW.

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19 A. Phase I RI. Respondents shall perform the Phase I RI as set forth
20 in the SOW. Within ten (10) months of the effective date of this Order, Respondents shall
21 submit to EPA and Ecology a Phase I RI Report. If EPA and Ecology disapprove of or require
22 revisions to the Phase I RI Report, in whole or in part, Respondents shall amend and submit a
23 revised Phase I RI Report to EPA and Ecology that is responsive to the directions in all joint
24 EPA and Ecology comments, within sixty (60) days of receiving EPA's and Ecology's joint
25 comments.

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27 B. Scoping For Phase II RI. EPA and Ecology determine the Site-
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1 specific objectives of the RI/FS and devise a general management approach for the Site, as stated
2 in the SOW. Respondents shall conduct the scoping activities as described in the attached SOW
3 and referenced guidance. Respondents shall provide EPA and Ecology with the following
4 deliverables:

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6 1. Phase II RI Work Plan. Within ninety (90) days after EPA and Ecology's
7 approval of the Phase I RI Report, Respondents shall submit a Phase II RI Work Plan to EPA and
8 Ecology. If EPA and Ecology disapprove of or require revisions to the Phase II RI Work Plan, in
9 whole or in part, Respondents shall amend and submit a revised Work Plan to EPA and Ecology
10 which is responsive to the directions in all joint EPA and Ecology comments, within thirty (30)
11 days of receiving EPA and Ecology's joint comments.
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13 2. Sampling and Analysis Plan. Within sixty (60) days after EPA and Ecology's
14 approval of the Phase II Work Plan, Respondents shall submit the Sampling and Analysis Plan to
15 EPA and Ecology. This plan shall consist of a Field Sampling Plan (FSP) and a Quality
16 Assurance Project Plan (QAPP), as described in the SOW and guidance. If EPA and Ecology
17 disapprove of or require revisions to the Sampling and Analysis Plan, in whole or in part,
18 Respondents shall amend and submit a revised Sampling and Analysis Plan to EPA and Ecology
19 which is responsive to the directions in all joint EPA and Ecology comments, within fifteen (15)
20 days of receiving EPA and Ecology's joint comments.
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22 3. Site Health and Safety Plan. Within sixty (60) days after EPA and Ecology's
23 approval of the Phase II Work Plan, Respondents shall submit the Site Health and Safety Plan to
24 EPA and Ecology.
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26 4. Following approval or modification by EPA or Ecology, the Phase II RI Work
27 Plan and the Sampling and Analysis Plan are incorporated by reference herein.
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1 C. Community Relations Plan. EPA and Ecology will prepare a Community
2 Relations/Public Participation Plan, in accordance with EPA guidance, the NCP, and WAC 173-
3 340-600(8). Respondents shall provide information supporting EPA and Ecology's community
4 relations programs.

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6 D. Site Characterization. Following EPA and Ecology's approval or
7 modification of the Phase II RI Work Plan and Sampling and Analysis Plan, Respondents shall
8 implement the provisions of these plans to characterize the Site. Respondents shall complete Site
9 characterization within twelve (12) months of EPA and Ecology approval or modification of the
10 Work Plan and Sampling and Analysis Plan. Respondents shall provide EPA and Ecology with
11 quality-assured analytical data within five (5) days after such data are available, in an electronic
12 format showing the location, medium, and results. Respondents shall provide all analytical data
13 to EPA and Ecology upon request within five (5) days of such request or such other time as EPA
14 and Ecology may agree to. Within seven (7) days of completion of field activities, Respondents
15 shall notify EPA and Ecology, in writing. During Site characterization, Respondents shall
16 provide EPA and Ecology with the following deliverables, as described in the SOW or Work
17 Plan:
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20 1. Technical Memorandum on Modeling of Site Characteristics. Where
21 Respondents propose that modeling is appropriate, Respondents shall submit a technical
22 memorandum on modeling of Site characteristics, as described in the SOW. If EPA and Ecology
23 disapprove of or require revisions to the technical memorandum on modeling of Site
24 characteristics, in whole or in part, Respondents shall amend and submit a revised technical
25 memorandum on modeling of Site characteristics to EPA and Ecology which is responsive to the
26 directions in all joint EPA and Ecology comments, within thirty (30) days of receiving EPA and
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1 Ecology's joint comments.

2 2. Preliminary Site Characterization Summary. Within sixty (60) days of completion
3 of the field sampling and analysis, as specified in the SOW, Respondents shall submit a
4 Preliminary Site Characterization Summary to EPA and Ecology.

5 E. FS Work Plan. As set forth in the SOW, an FS Work Plan shall be
6 developed during the Phase II RI for the performance of the FS. Respondents shall submit a draft
7 FS Work Plan as described in the SOW to EPA and Ecology. If EPA and Ecology disapprove of
8 or require revisions to the FS Work Plan, in whole or in part, Respondents shall amend and
9 submit a revised FS Work Plan to EPA and Ecology which is responsive to the directions in all
10 EPA and Ecology joint comments, within thirty (30) days of receiving EPA and Ecology's
11 comments
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14 F. Draft Remedial Investigation Report. Within sixty (60) days after EPA
15 and Ecology approval of the Preliminary Site Characterization Summary, Respondents shall
16 submit a Draft Phase II RI Report consistent with the SOW, Phase II RI Work Plan, and
17 Sampling and Analysis Plan. If EPA and Ecology disapprove of or require revisions to the Phase
18 II RI report, in whole or in part, Respondents shall amend and submit a revised Phase II RI report
19 to EPA and Ecology which is responsive to the directions in all EPA and Ecology joint
20 comments, within sixty (60) days of receiving EPA and Ecology's comments.

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22 G. Treatability Studies. If required by the FS Work plan, Respondents shall
23 conduct treatability studies. Major components of the treatability studies include determination
24 of the need for, and scope of, studies, the design of the studies, and the completion of the studies,
25 as described in the SOW and FS Work Plan. During treatability studies, Respondents shall
26 provide EPA and Ecology with the following deliverables:
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1 1. Identification of Candidate Technologies Memorandum. This memorandum shall
2 be submitted within thirty (30) days after EPA and Ecology approval of the FS Work Plan. If
3 EPA and Ecology disapprove of or require revisions to the technical memorandum identifying
4 candidate technologies, in whole or in part, Respondents shall amend and submit a revised
5 technical memorandum identifying candidate technologies to EPA and Ecology which is
6 responsive to the directions in EPA and Ecology's comments, within fifteen (15) days of
7 receiving EPA and Ecology's comments.
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9 2. Treatability Testing Statement of Work. If EPA and Ecology determine that
10 treatability testing is required, as set forth in the FS Work Plan, Respondents shall submit a
11 Treatability Testing Statement of Work.
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13 3. Treatability Testing Work Plan. Within thirty (30) days after submission of the
14 Treatability Testing Statement of Work, Respondents shall submit a Treatability Testing Work
15 Plan, including a schedule. If EPA and Ecology disapprove of or require revisions to the
16 Treatability Testing Work Plan, in whole or in part, Respondents shall amend and submit a
17 revised Treatability Testing Work Plan to EPA and Ecology which is responsive to the directions
18 in all EPA or Ecology comments, within fifteen (15) days of receiving EPA or Ecology's
19 comments.
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21 4. Treatability Study Sampling and Analysis Plan. Within thirty (30) days after the
22 identification of the need for a separate or revised QAPP or FSP, Respondents shall submit a
23 Treatability Study Sampling and Analysis Plan. If EPA and Ecology disapprove of or require
24 revisions to the Treatability Study Sampling and Analysis Plan, in whole or in part, Respondents
25 shall amend and submit a revised Treatability Study Sampling and Analysis Plan to EPA and
26 Ecology which is responsive to the directions in all EPA or Ecology comments, within fifteen
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1 (15) days of receiving EPA or Ecology's comments.

2 5. Treatability Study Site Health and Safety Plan. Within thirty (30) days after the
3 identification of the need for a revised Health and Safety Plan, Respondents shall submit a
4 Treatability Study Site Health and Safety Plan.

5 6. Treatability Study Evaluation Report. Within thirty (30) days after completion of
6 any treatability testing, Respondents shall submit a Treatability Study Evaluation Report as
7 provided in the SOW and/or Work Plan. If EPA and Ecology disapprove of or require revisions
8 to the Treatability Study Report, in whole or in part, Respondents shall amend and submit a
9 Revised Treatability Study Report to EPA and Ecology which is responsive to the directions in
10 all EPA or Ecology comments, within fifteen (15) days of receiving EPA or Ecology's comments.

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12 H. Development and Screening of Alternatives. Respondents shall develop
13 an appropriate range of waste management options that will be evaluated through the
14 development and screening of alternatives, as provided in the SOW and FS Work Plan
15 thereunder requiring an FS. During the development and screening of alternatives, Respondents
16 shall provide EPA and Ecology with the following deliverables, as set forth in the FS Work Plan:

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18 1. Memorandum on Remedial Action Objectives.
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20 2. Memorandum on Development and Preliminary Screening of Alternatives,
21 Assembled Alternatives Screening Results and Final Screening. Within thirty (30) days of
22 submittal of the memorandum on remedial action objectives, Respondents shall submit a
23 memorandum summarizing the development and screening of remedial alternatives, including an
24 alternatives array document as described in the FS Work Plan.

25
26 I. Detailed Analysis of Alternatives. Respondents shall conduct a detailed
27 analysis of remedial alternatives, as described in the FS Work Plan. During the detailed analysis
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1 of alternatives, Respondents shall provide EPA and Ecology with the following deliverables and
2 presentation:

3 1. Report on Comparative Analysis and Presentation to EPA and Ecology. Within
4 sixty (60) days of submission of a memorandum on the development and screening of remedial
5 alternatives, Respondents shall submit a report on comparative analysis to EPA and Ecology
6 summarizing the results of the comparative analysis performed between the remedial alternatives.
7 If EPA and Ecology disapprove of or require revisions to the report on comparative analysis,
8 Respondents shall amend and submit a revised report on comparative analysis to EPA and
9 Ecology which is responsive to the directions in all joint EPA and Ecology comments, within
10 fifteen (15) days of receiving EPA and Ecology's joint comments. Within two (2) weeks of
11 submitting the original report on comparative analysis, Respondents shall make a presentation to
12 EPA and Ecology during which Respondents shall summarize the findings of the RI and remedial
13 action objectives, and present the results of the remedy selection criteria evaluation and
14 comparative analysis, as described in the FS Work Plan.

17 2. Draft Feasibility Study Report. Within ninety (90) days of the presentation to
18 EPA and Ecology, Respondents shall submit a Draft FS Report which reflects the findings in the
19 Baseline Risk Assessment. Respondents shall refer to Table 6-5 of the RI/FS Guidance and
20 Ecology guidance for report content and format. If EPA and Ecology disapprove of or require
21 revisions to the Draft FS Report, in whole or in part, Respondents shall amend and submit a
22 Revised FS Report to EPA and Ecology which is responsive to the directions in all EPA and
23 Ecology comments, within fifteen (15) days of receiving EPA and Ecology's comments. The
24 report, as amended, and the administrative record, shall provide the basis for the Proposed Plan
25 under CERCLA §§ 113(k) and 117(a)/Proposed CAP by EPA and Ecology, and shall document
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1 the development and analysis of remedial alternatives.

2 3. EPA and Ecology reserve the right to comment on, modify, and direct changes for
3 all deliverables in writing, and will meet with Respondents in an effort to resolve any significant
4 disputes. At EPA and Ecology's discretion, Respondents must fully correct all deficiencies and
5 incorporate and integrate all information and comments supplied by EPA or Ecology either in
6 subsequent or resubmitted deliverables.
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8 4. Respondents shall not proceed further with any subsequent activities or tasks until
9 receiving EPA and Ecology approval for the following deliverables: Phase II RI Work Plan,
10 Sampling and Analysis Plan, Draft Phase I RI Report, Treatability Testing Work Plan, and
11 Sampling and Analysis Plan, Draft Phase II RI Report, FS Work Plan and Draft FS Report.
12 While awaiting EPA and Ecology approval on these deliverables, Respondents shall proceed
13 with all other tasks and activities which may be conducted independently of these deliverables, in
14 accordance with the schedule set forth in this Consent Order.
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16 5. Upon receipt of the Draft FS Report, EPA and Ecology will evaluate, as
17 necessary, the estimates of the risk to the public and environment that are expected to remain
18 after a particular remedial alternative has been completed.
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20 6. For all remaining deliverables not requiring EPA and Ecology approval,
21 Respondents shall proceed with all subsequent tasks, activities, and deliverables without awaiting
22 EPA and Ecology approval on the submitted deliverable. EPA and Ecology reserve the right to
23 stop Respondents from proceeding further, either temporarily or permanently, on any task,
24 activity, or deliverable at any point during the RI/FS. If EPA and Ecology suspend work on any
25 task, activity or deliverable, the deadline for completion of the suspended task, activity or
26 deliverable shall be extended for the length of the suspension.
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1 7. If Respondents amend or revise a report, plan, or other submittal upon receipt of
2 EPA and Ecology comments, and EPA and Ecology subsequently disapprove of the revised
3 submittal, or if subsequent submittals do not fully reflect EPA and Ecology's directions for
4 changes, EPA and Ecology retain the right to seek penalties, perform their own studies, complete
5 the RI/FS (or any portion of the RI/FS) under CERCLA and the NCP, and MTCA and the WAC,
6 and seek reimbursement from Respondents for costs, and/or seek any other appropriate relief.
7 Respondents reserve all rights consistent with this Order to defend against any such action by
8 EPA or Ecology.
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10 8. If EPA and/or Ecology take over some of the tasks, but not the preparation of the
11 RI/FS, Respondents shall incorporate and integrate information supplied by EPA or Ecology into
12 the Final RI and/or FS Report.
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14 9. Neither failure of EPA and Ecology to expressly approve or disapprove of
15 Respondents' submissions within any specified time period(s), nor the absence of comments,
16 shall be construed as approval by EPA and Ecology. Regardless of whether EPA and Ecology
17 gives express approval for Respondents' deliverables, Respondents are responsible for preparing
18 deliverables acceptable to EPA and Ecology. All EPA and Ecology approvals and disapprovals
19 of deliverables shall be in writing.
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21 10. Respondents shall, prior to any off-Site shipment of hazardous substances from
22 the Site to an out-of-state waste management facility, provide written notification to the
23 appropriate state environmental official in the receiving state and to EPA and Ecology's
24 Designated Project Coordinators of such shipment of hazardous substances. However, the
25 notification of shipments shall not apply to any such off-Site shipments when the total volume of
26 such shipments will not exceed ten (10) cubic yards. The notification shall be in writing, and
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1 shall include the following information, where available: (1) the name and location of the
2 facility to which the hazardous substances are to be shipped; (2) the type and quantity of the
3 hazardous substances to be shipped; (3) the expected schedule for the shipment of the hazardous
4 substances; and (4) the method of transportation. Respondents shall notify the receiving state of
5 major changes in the shipment plan, such as a decision to ship the hazardous substances to
6 another facility within the same state, or to a facility in another state.
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8 9 IX. BASELINE RISK ASSESSMENT

10 1. Respondents shall perform the baseline risk assessment in accordance with EPA and
11 Ecology guidance. The major components of the Baseline Risk Assessment include but may not
12 be limited to contaminant identification, exposure assessment, toxicity assessment, and human
13 health and ecological risk characterization.
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15 16 X. MODIFICATION OF THE WORK PLAN

17 1. If at any time during the RI/FS process, Respondents identify a need for additional
18 data, a memorandum documenting the need for additional data shall be submitted to the EPA and
19 Ecology Project Coordinators within twenty (20) days of identification. EPA and Ecology, in
20 their discretion, will determine whether the additional data will be collected by Respondents and
21 whether it will be incorporated into reports and deliverables.
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23 2. In the event of conditions posing an immediate threat to human health or welfare
24 or the environment, Respondents shall notify EPA and Ecology immediately. In the event of
25 unanticipated or changed circumstances at the Site, Respondents shall notify the EPA and
26 Ecology Project Coordinators by telephone within twenty-four (24) hours of discovery of the
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1 unanticipated or changed circumstances.

2 3. EPA and Ecology may determine that in addition to tasks defined in the initially
3 approved Work Plan, other additional work may be necessary to accomplish the objectives of the
4 RI/FS as set forth in the SOW and Work Plans. Respondents shall perform these response
5 actions in addition to those required by the SOW or any approved Work Plan. Except where
6 necessary to abate an emergency, Respondents shall not perform any remedial activities at the
7 Site inconsistent with this Order unless EPA and Ecology concur in writing with such additional
8 activities. Respondents shall confirm their willingness to perform the additional work, in
9 writing, to EPA and Ecology within seven (7) days of receipt of the EPA and Ecology request, or
10 Respondents shall invoke dispute resolution. Subject to EPA/Ecology resolution of any dispute,
11 Respondents shall implement the additional tasks which EPA and Ecology determine are
12 necessary. The additional work shall be completed according to the standards, specifications,
13 and schedule set forth or approved by EPA and Ecology in a written modification to the Work
14 Plan or written Work Plan Supplement. EPA and Ecology reserve the right to conduct the work
15 themselves at any point, to seek reimbursement from Respondents, and/or to seek any other
16 appropriate relief. If EPA and Ecology determine that conditions at the Site are creating or have
17 the potential to create a danger to human health or welfare on-site or in the surrounding area or to
18 the environment, EPA and Ecology may order Respondents to stop further implementation of
19 this Order for such period of time in the judgment of EPA and Ecology is needed to abate the
20 danger.
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25 XI. QUALITY ASSURANCE

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27 1. Respondents shall assure that work performed, samples taken, and analyses
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1 conducted conform to the requirements of any SOW, the QAPP and guidance identified therein.
2 Respondents will assure that field personnel used by Respondents are properly trained in the use
3 of field equipment and in chain-of-custody procedures.
4

5 **XII. FINAL RI/FS, PROPOSED PLAN, PUBLIC COMMENT, RECORD OF DECISION/
6 CLEANUP ACTION PLAN, AND ADMINISTRATIVE RECORD**
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8 1. EPA and Ecology retain the responsibility for the release to the public of the
9 RI/FS Report. EPA and Ecology retain responsibility for the preparation and release to the
10 public of the Proposed Plan and the Record of Decision/Cleanup Action Plan in accordance with
11 CERCLA, the NCP, MTCA and chapters 173-340 and 173-204 WAC.
12

13 2. EPA and Ecology shall provide Respondents with the Proposed Plan, and Record
14 of Decision/Cleanup Action Plan.

15 3. EPA will determine the contents of its administrative record file for selection of
16 the remedial action. Respondents must submit to EPA and Ecology documents developed during
17 the course of the RI/FS upon which selection of the response action may be based. Respondents
18 shall provide copies of plans, task memoranda, including documentation of field modifications,
19 recommendations for further action, quality assurance memoranda and audits, raw data, field
20 notes, laboratory analytical reports, and other reports concerning the implementation of this
21 Consent Order. Respondents must additionally submit any previous non-privileged studies
22 conducted privately by the Respondents or other previous studies conducted under state, local, or
23 federal authorities relating to selection of the response action, and all communications between
24 Respondents and state, local, or other federal authorities concerning selection of the response
25 action. At EPA and Ecology's discretion, Respondents may establish a community information
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1 repository at or near the Site, to house one copy of the administrative record.

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3 **XIII. PROGRESS REPORTS AND MEETINGS**

4 1. Respondents shall make presentations at, and participate in, meetings at the
5 request of EPA and Ecology during the initiation, conduct, and completion of the RI/FS. In
6 addition to discussion of the technical aspects of the RI/FS, topics will include anticipated
7 problems or new issues. Meetings will be scheduled at EPA and Ecology's discretion.

8
9 2. In addition to the deliverables set forth in this Order, Respondents shall provide to
10 EPA and Ecology monthly progress reports by the tenth (10th) day of the following month. At a
11 minimum, with respect to the preceding month, these progress reports shall: (1) describe the
12 actions which have been taken to comply with this Consent Order during that month; (2) include
13 all results of sampling and tests and all other data received by Respondents; (3) describe work
14 planned for the next two (2) months with schedules relating such work to the overall project
15 schedule for RI/FS completion; and (4) describe all problems encountered and any anticipated
16 problems, any actual or anticipated delays, and solutions developed and implemented to address
17 any actual or anticipated problems or delays.
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21 **XIV. SAMPLING, ACCESS, AND DATA AVAILABILITY/ADMISSIBILITY**

22 1. All results of sampling, tests, modeling, or other data (including raw data)
23 generated by Respondents, or on Respondents' behalf, for the implementation of this Consent
24 Order, shall be submitted to EPA and Ecology in the subsequent Monthly Progress Report as
25 described in the preceding Section of this Order. EPA and Ecology will each make available to
26 the Respondents validated data generated by that agency unless it is exempt from disclosure by
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1 any federal or state law or regulation.

2 2. Respondents will verbally notify EPA and Ecology at least fifteen (15) days prior
3 to conducting significant field events as described in the SOW, Work, Work Plan, or Sampling
4 and Analysis Plan. At EPA and Ecology's verbal or written request, or the request of EPA's
5 oversight assistant, Respondents shall allow split or duplicate samples to be taken by EPA and
6 Ecology (and their authorized representatives) of any samples collected by Respondents in
7 implementing this Consent Order. All split samples of Respondents shall be analyzed by the
8 methods identified in the QAPP.
9

10 3. At all reasonable times, EPA, Ecology, and their authorized representatives shall
11 have the authority to enter and freely move about all property over which the Respondents have
12 possession or control at the Site and off-Site areas where work, if any, is being performed, for the
13 purposes of inspecting conditions, activities, the results of activities, records, operating logs, and
14 contracts related to the Site pursuant to this Order; reviewing the progress of the Respondents in
15 carrying out the terms of this Consent Order; conducting tests as EPA, Ecology or their
16 authorized representatives deem necessary; using a camera, sound recording device, or other
17 documentary type equipment; and verifying the data submitted to EPA and Ecology by the
18 Respondents. Respondents shall allow these persons to inspect and copy all non-privileged
19 records, files, photographs, documents, sampling and monitoring data, and other non-privileged
20 writings related to work undertaken in carrying out this Consent Order. Nothing herein shall be
21 interpreted as limiting or affecting EPA's and Ecology's right of entry or inspection authority
22 under federal or state law. All parties with access to the Site under this paragraph shall comply
23 with all approved Health and Safety Plans required by the SOW. By signing this Consent Order
24 Respondents agree that this Order constitutes reasonable notice of access, and agree to allow
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1 access to the Site at all reasonable times for purposes of overseeing work performed under this
2 Order. If EPA and Ecology desire to obtain access to any manufacturing or process areas which
3 Respondent The Boeing Company has appropriately designated for conducting activities utilizing
4 secrets associated with U.S. Department of Defense (DOD) projects, The Boeing Company may
5 request a reasonable delay to providing such access so that it may confer with EPA's and Ecology
6 representatives regarding the purpose of the inspection in the area and appropriate precautions for
7 protecting DOD secrets.
8

9 4. Respondents may assert a claim of business confidentiality covering part or all of
10 the information submitted to EPA pursuant to the terms of this Consent Order under 40 C.F.R.
11 § 2.203, provided such claim is allowed by Section 104(e)(7) of CERCLA, 42 U.S.C. §
12 9604(e)(7). This claim shall be asserted in the manner described by 40 C.F.R. § 2.203(b), and
13 substantiated at the time the claim is made. Information determined to be confidential by EPA
14 will be given the protection specified in 40 C.F.R. Part 2. If no such claim accompanies the
15 information when it is submitted to EPA, it may be made available to the public by EPA or the
16 state without further notice to the Respondents. Respondents agree not to assert confidentiality
17 or privilege claims with respect to any data related to Site conditions, sampling, or monitoring.
18 This paragraph does not affect any obligation of Ecology to disclose records under state law.
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21 5. In entering into this Order, Respondents waive any objections to the release of any
22 data gathered, generated, or evaluated by EPA, Ecology or Respondents in the performance or
23 oversight of the work that has been verified according to the quality assurance/quality control
24 (QA/QC) procedures required by the Consent Order or any EPA or Ecology-approved Work
25 Plans or Sampling and Analysis Plans. If Respondents object to the release of any other data
26 relating to the RI/FS, Respondents shall submit to EPA and Ecology a report that identifies and
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1 explains its objections, describes the acceptable uses of the data, if any, and identifies any
2 limitations to the use of the data. The report must be submitted to EPA and Ecology within
3 fifteen (15) days of the monthly progress report containing the data.

4 6. If the Site, or the off-Site area that is to be used for access or is within the scope of
5 the RI/FS, is owned in whole or in part by parties other than those bound by this Consent Order,
6 Respondents will use best efforts to obtain Site access agreements from the present owner(s)
7 within one hundred twenty (120) days from the date the EPA or Ecology determines that access
8 is needed. Such agreements shall provide access for EPA and Ecology, their contractors and
9 oversight officials, or their authorized representatives, and such agreements shall specify that
10 Respondents are not EPA or Ecology's representative with respect to liability associated with Site
11 activities. Such agreements shall not limit the authorities of EPA or Ecology to obtain access in
12 any way. Copies of such agreements shall be provided to EPA and Ecology prior to
13 Respondents' initiation of field activities. Respondents' best efforts shall include providing
14 reasonable compensation to any off-Site property owner. If access agreements are not obtained
15 within the time referenced above, Respondents shall immediately notify EPA and Ecology of its
16 failure to obtain access. EPA and/or Ecology may obtain access for Respondents, perform those
17 tasks or activities themselves, or terminate the Consent Order in the event that Respondents
18 cannot obtain access agreements. In the event that EPA and/or Ecology performs those tasks or
19 activities with EPA or Ecology contractors and does not terminate the Consent Order,
20 Respondents shall perform all other activities not requiring access to that Site, and shall
21 reimburse EPA for all EPA costs incurred which are not inconsistent with the NCP and shall
22 reimburse Ecology for all Ecology costs incurred in performing such activities. Respondents
23 shall integrate the results of any such tasks undertaken by EPA or Ecology into its reports and
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1 deliverables. Respondents also agree to indemnify the United States and State of Washington as
2 specified in Section XXV of this Order.

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4 **XV. DESIGNATED PROJECT COORDINATORS**

5 1. Documents including reports, approvals, disapprovals, and other correspondence
6 which must be submitted under this Consent Order, shall be sent by certified mail, return receipt
7 requested, to the following addressees or to any other addressees which Respondents, EPA, and
8 Ecology designate in writing. When documents are sent to Respondents' Project Coordinator,
9 EPA and Ecology shall send electronic notification to each Respondent.
10

11 (a) Five copies of documents submitted to EPA :

12 Allison Hiltner
13 EPA Project Coordinator,
14 U.S. Environmental Protection Agency
15 1200 Sixth Avenue, M/S ECL-111
16 Seattle, WA 98101

17 (b) Four copies of documents submitted to Ecology:

18 Rick Huey
19 Ecology Project Coordinator
20 Department of Ecology
21 3190 160th Avenue S.E.
22 Bellevue, WA 98008

23 (c) Documents submitted to Respondents:

24 D. Michael Johns
25 Wind Ward Environmental, LLC
26 200 West Mercer Street, Suite 401
27 Seattle, WA 98119
28

2. On or before the effective date of this Consent Order, EPA, Ecology, and
Respondents shall each designate their own Project Coordinator. Each Project Coordinator shall
be responsible for overseeing the implementation of this Consent Order. To the maximum extent
possible, communications between Respondents and EPA and Ecology shall be directed to the
Project Coordinator by mail or electronic mail, with copies to such other persons as EPA,

1 Ecology, and Respondents may respectively designate. Communications include, but are not
2 limited to, all documents, reports, approvals, and other correspondence submitted under this
3 Consent Order.

4 3. EPA, Ecology, and Respondents all have the right to change their
5 respective Project Coordinator. All parties must be notified, in writing, at least ten (10) days
6 prior to the change.

7 4. EPA's Project Coordinator shall have the authority lawfully vested in a
8 Remedial Project Manager (RPM) and On-Scene Coordinator (OSC) by the NCP. EPA's Project
9 Coordinator shall have the authority consistent with the NCP, and Ecology's Project Coordinator
10 shall have the authority under MTCA to halt any work required by this Consent Order, and to
11 take any necessary response when he or she determines that conditions at the Site may present an
12 immediate endangerment to public health or welfare or the environment. The absence of the
13 EPA or Ecology Project Coordinator from the area under study pursuant to this Consent Order
14 shall not be cause for the stoppage or delay of work.

15 5. EPA shall arrange for a qualified person to assist in its oversight and
16 review of the conduct of the RI/FS, as required by Section 104(a) of CERCLA, 42 U.S.C. §
17 9604(a). The oversight assistant may observe work and make inquiries in the absence of EPA,
18 but is not authorized to modify the Work Plan.

19 20 XVI. OTHER APPLICABLE LAWS

21 1. Respondents shall comply with all laws that are applicable when
22 performing work pursuant to this Order. No local, state, or federal permit shall be required for
23 any portion of any action conducted entirely on-site, including studies, where such action is
24 selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621.

25 26 XVII. RECORD PRESERVATION

27 1. All records and documents in Respondents' possession that concern the
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1 implementation of this Order shall be preserved during the conduct of this Consent Order and for
2 a minimum of ten (10) years after completion of the work performed under this Consent Order.
3 Respondents shall acquire and retain copies of all documents that relate to the Site and are in the
4 possession of its employees, agents, contractors and consultants. After this 10-year period,
5 Respondents shall notify EPA and Ecology at least ninety (90) days before the documents are
6 scheduled to be destroyed. If EPA and Ecology request that the documents be saved,
7 Respondents shall, at no cost to EPA and Ecology, give the requesting agency all non-privileged
8 documents or copies of the non-privileged documents.

9 10 XVIII. DISPUTE RESOLUTION

11 1. Any disputes concerning activities or deliverables required under this
12 Order, shall be resolved as follows: If any Respondent objects to any EPA and Ecology notice of
13 disapproval or requirement made pursuant to this Consent Order, the Respondent shall notify
14 EPA's and Ecology's Project Coordinators, in writing, of its objections within fourteen (14) days
15 of receipt of the disapproval notice or requirement. Respondent's written objections shall define
16 the dispute, state the basis of Respondent's objections, and be sent certified mail, return receipt
17 requested. EPA, Ecology and Respondent then have an additional fourteen (14) days from the
18 Respondent's receipt of the return receipt to reach agreement. If an agreement is not reached
19 within fourteen (14) days, the Respondent may request a determination by EPA's Environmental
20 Cleanup Division (ECL) Director and Ecology's Toxics Cleanup Program (TCP) Manager, or
21 his/her successor(s). The ECL Director and TCP Manager's determination is EPA and Ecology's
22 final decision. Respondent shall proceed in accordance with EPA and Ecology's final decision
23 regarding the matter in dispute, regardless of whether Respondent agrees with the decision. If
24 any Respondent does not agree to perform or does not actually perform the work in accordance
25 with EPA and Ecology's final decision, EPA and Ecology each reserve the right in their sole
26 discretion to conduct the work itself, to seek reimbursement from the Respondent(s), to seek
27 enforcement of the decision, to seek penalties, and/or to seek any other appropriate relief.

28 2. No Respondent is relieved of its obligations to perform and conduct

activities and submit deliverables on the schedule set forth in the SOW or any Work Plan, while a matter is pending in dispute resolution. The invocation of dispute resolution does not stay stipulated penalties under this Order.

XIX. DELAY IN PERFORMANCE, EPA STIPULATED PENALTIES, ENFORCEMENT

1. Unless there is Force Majeure as defined in Section XX below, if Respondents fail to complete a deliverable in a timely manner or fail to produce a deliverable of acceptable quality, or otherwise fail to perform in accordance with the requirements of this Order, Respondents shall be liable to EPA for stipulated penalties. Penalties begin to accrue on the day that performance is due or a violation occurs, and extend through the period of correction. Where a revised submission by Respondents is required, stipulated penalties shall continue to accrue until a satisfactory deliverable is produced. EPA will provide written notice for violations that are not based on timeliness; nevertheless, penalties shall accrue from the day a violation commences. EPA and Ecology may, in their discretion, waive imposition of stipulated penalties if they determine that Respondents have attempted in good faith to comply with this Order or in the event of timely cure of defects in initial submissions. If assessed, payment shall be due within thirty (30) days of receipt of a demand letter from EPA.

2. Respondents shall pay interest on the unpaid balance, which shall begin to accrue at the end of the 30-day period, at the rate established by the Department of Treasury pursuant to 30 U.S.C. § 3717. Respondents shall further pay a handling charge of one percent (1%), to be assessed at the end of each thirty-one (31) day period, and a six percent (6%) per annum penalty charge, to be assessed if the penalty is not paid in full within ninety (90) days after it is due.

3. Respondents shall make all payments by forwarding a check, made payable to the Hazardous Substance Superfund, to: Mellon Bank, EPA Region 10-Superfund Accounting, P.O. Box 360903M, Pittsburgh, Pennsylvania 15251.

1 Checks should identify the name of the Site, the Site identification number 10XX, and the
2 title of this Order. A copy of the check and/or transmittal letter shall be forwarded to the
3 EPA and Ecology Project Coordinators.

4 4. For the following major deliverables, stipulated penalties shall accrue in
5 the amount of \$500 per day, per violation, for the first seven days of noncompliance;
6 \$1,000 per day, per violation, for the 8th through 14th day of noncompliance; \$2,500 per
7 day, per violation, for the 15th day through the 30th day; and \$5,000 per day per violation
8 for the 31st day through the 90th day

- 9 1) An original and any revised Work Plan.
- 10 2) An original and any revised Sampling and Analysis Plan.
- 11 3) An original and any revised RI Report.
- 12 4) An original and any revised Treatability Testing Work Plan.
- 13 5) An original and any revised Treatability Study Sampling and Analysis
14 Plan.
- 15 6) An original and any revised FS Report.

16 5. For the following interim deliverables, stipulated penalties shall accrue in the
17 amount of \$250 per day, per violation, for the first week of noncompliance; \$500 per day,
18 per violation, for the 8th through 14th day of noncompliance; \$1,500 per day, per
19 violation, for the 15th day through the 30th day of noncompliance; and \$2,500 per day per
20 violation for the 31st through the 90th day.

- 21 1) Technical memorandum on modeling of Site characteristics.
- 22 2) Preliminary Site Characterization Summary.
- 23 3) Summary of RI data.
- 24 4) Identification of candidate technologies memorandum.
- 25 5) Treatability Testing Statement of Work.
- 26 6) Treatability Study Evaluation Report.
- 27 7) Memorandum on remedial action objectives.

1 8) Memoranda on development and preliminary screening of alternatives,
2 assembled alternatives screening results, and final screening.

3 9) Comparative analysis report.

4 6. For the Monthly Progress Reports, stipulated penalties shall accrue in the amount
5 of \$200 per day, per violation, for the first week of noncompliance; \$500 per day, per
6 violation, for the 8th through 14th day of noncompliance; \$1,000 per day, per violation,
7 for the 15th day through the 30th day; and \$2,000 per day, per violation, for the 31st
8 through the 90th day.

9 7. Respondents may dispute EPA's right to the stated amount of penalties by
10 invoking the dispute resolution procedures under Section XVII herein. Penalties shall
11 accrue, but need not be paid, during the dispute resolution period. If Respondents do not
12 prevail upon resolution, all penalties shall be due to EPA within thirty (30) days of
13 resolution of the dispute. If Respondents prevails upon resolution, no penalties shall be
14 paid.

15 8 In the event that EPA provides for corrections to be reflected in the next
16 deliverable and does not require resubmission of that deliverable, stipulated penalties for
17 that interim deliverable shall cease to accrue on the date of such decision by EPA.

18 9. The stipulated penalties provisions do not preclude EPA from pursuing
19 any other remedies or sanctions which are available to EPA because of Respondents'
20 failure to comply with this Consent Order, including, but not limited to, conduct of all or
21 part of the RI/FS. Payment of stipulated penalties does not alter Respondents' obligation
22 to complete performance under this Consent Order. Nothing in this Section on EPA's
23 imposition of stipulated penalties in any way limits Ecology's authority or capacity to
24 enforce this Order.

25 10. Pursuant to RCW 70.105D.050, the State may enforce this Order as
26 follows:

27 (a) The Attorney General may bring an action to enforce this Order in a
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1 state or federal court.

2 (b) The Attorney General may seek, by filing an action if necessary, to
3 recover amounts spent by Ecology for investigative and remedial actions and orders
4 related to the Site.

5 (c) In the event Respondents refuse, without sufficient cause, to comply
6 with any term of this Order, Respondents will be liable for up to three times the amount
7 of any costs incurred by the State of Washington as a result of its refusal to comply, and
8 civil penalties of up to \$25,000 per day for each day it refuses to comply.

9 (d) This Order is not appealable to the Washington Pollution Control
10 Hearings Board. This Order may be reviewed only as provided under RCW
11 70.105D.060.

12 11. Respondents are each jointly and severally liable to comply with this
13 Order. Failure to comply by one Respondent does not excuse performance by the other
14 Respondents.

15
16 XX. FORCE MAJEURE

17
18 1. "Force Majeure", for purposes of this Consent Order, is defined as any
19 event arising from causes beyond the control of Respondents and of any entity controlled by
20 Respondents, including their contractors and subcontractors, that delays the timely performance
21 of any obligation under this Consent Order notwithstanding Respondents' best efforts to avoid
22 the delay. The requirement that the Respondents exercise "best efforts to avoid the delay"
23 includes using best efforts to anticipate any potential Force Majeure event and best efforts to
24 address the effects of any potential Force Majeure event (1) as it is occurring, and (2) following
25 the potential Force Majeure event, such that the delay is minimized to the greatest extent
26 practicable. Examples of events that are not Force Majeure events include, but are not limited to,
27 increased costs or expenses of any work to be performed under this Order or the financial
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1 difficulty of Respondents to perform such work.

2 2. If any event occurs or has occurred that may delay the performance of any
3 obligation under this Order, whether or not caused by a Force Majeure event, Respondents shall
4 notify, by telephone, the EPA Remedial Project Manager or, in his or her absence, the ECL
5 Director, and Ecology's Project Coordinator within forty-eight (48) hours of when Respondents
6 knew or should have known that the event might cause a delay. Within five (5) business days
7 thereafter, Respondents shall provide, in writing, the reasons for the delay, the anticipated
8 duration of the delay, all actions taken or to be taken to prevent or minimize the delay, a schedule
9 for implementation of any measures to be taken to mitigate the effect of the delay, and a
10 statement as to whether, in the opinion of Respondents, such event may cause or contribute to an
11 endangerment to public health, welfare, or the environment. Respondents shall exercise best
12 efforts to avoid or minimize any delay and any effects of a delay. Failure to comply with the
13 above requirements shall preclude Respondents from asserting any claim of Force Majeure.

14 3. If EPA and Ecology agree that the delay or anticipated delay is attributable
15 to Force Majeure, the time for performance of the obligations under this Order that are directly
16 affected by the Force Majeure event shall be extended by agreement of the parties, pursuant to
17 Section XXVI of this Order, for a period of time not to exceed the actual duration of the delay
18 caused by the Force Majeure event. An extension of the time for performance of the obligation
19 directly affected by the Force Majeure event shall not, of itself, extend the time for performance
20 of any subsequent obligation.

21 4. If EPA and Ecology do not agree that the delay or anticipated delay has
22 been or will be caused by a Force Majeure event, or do not agree with Respondents on the length
23 of the extension, the issue shall be subject to the dispute resolution procedures set forth in
24 Section XVII of this Order. In any such proceeding, to qualify for a Force Majeure defense,
25 Respondents shall have the burden of demonstrating by a preponderance of the evidence that the
26 delay or anticipated delay has been or will be caused by a Force Majeure event, that the duration
27 of the delay was or will be warranted under the circumstances, that Respondents did exercise or
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1 are exercising due diligence by using its best efforts to avoid and mitigate the effects of the delay,
2 and that Respondents complied with the requirements of this Section.

3 5. Should Respondents carry the burden set forth in the preceding Paragraph
4 the delay at issue shall be deemed not to be a violation of the affected obligation of this Consent
5 Order.

6
7 XXI. RESERVATIONS OF RIGHTS AND REIMBURSEMENT OF COSTS

8 1. Subject to the terms and conditions of any applicable consent decrees,
9 EPA reserves the right to bring an action against Respondents under Section 107 of CERCLA, 42
10 U.S.C. § 9607, for recovery of all response costs including oversight costs, incurred by the
11 United States at the Site that are not reimbursed by Respondents, any costs incurred in the event
12 that EPA performs the RI/FS or any part thereof, and any future costs incurred by the United
13 States in connection with response activities conducted under CERCLA at this Site.

14 2. EPA reserves the right to bring an action against Respondents to enforce
15 the cost reimbursement requirements of this Consent Order, to collect stipulated penalties
16 assessed pursuant to this Consent Order, and to seek penalties pursuant to Section 109 of
17 CERCLA, 42 U.S.C. § 9609.

18 3. Except as expressly provided in this Order, each party reserves all rights
19 and defenses it may have. Nothing in this Consent Order shall affect EPA's removal authority or
20 EPA's response or enforcement authorities including, but not limited to, the right to seek
21 injunctive relief, stipulated penalties, statutory penalties, and/or punitive damages.

22 4. Following satisfaction of the requirements of this Consent Order,
23 Respondents shall have resolved their liability to EPA for the work performed by Respondents
24 pursuant to this Consent Order. Respondents are not released from liability, if any, for any
25 response actions taken beyond the scope of this Order regarding removals, other operable units,
26 remedial design/remedial action, or activities arising pursuant to Section 121(c) of CERCLA, 42
27 U.S.C. § 9621(c).

1 5. EPA and Ecology recognize that Respondents are entering into this
2 Consent Order notwithstanding that contamination at the Site may have been caused by entities
3 other than Respondents. In actions concerning the Site, EPA agrees to apply the EPA Orphan
4 Policy, attached as Attachment B.

5 6. Respondents shall pay to Ecology costs incurred by Ecology after the
6 effective date of this Order for the implementation of this Order. These costs shall include work
7 performed by Ecology or its contractors for investigations, remedial actions, oversight and
8 administration. Ecology costs shall include costs of direct activities and support costs of direct
9 activities as defined in WAC 173-340-550(2). Respondents shall pay the required amount within
10 90 days of receiving from Ecology an itemized statement of costs that includes a summary of
11 costs incurred, an identification of involved staff, and the amount of time spent by involved staff
12 members on the project. A general description of work performed will be provided upon request.
13 Itemized statements shall be prepared quarterly. Respondents also may review underlying
14 Ecology oversight cost documentation, including personnel time sheets, travel authorizations,
15 vouchers, and all applicable laboratory and other costs. Failure to pay Ecology's costs within 90
16 days of receipt of the itemized statement of costs will result in interest charges.

17 7. This Consent Order is not a settlement of liability under RCW 70.105D.
18 Ecology's signature on this Consent Order in no way constitutes a covenant not to sue or a
19 compromise of any Ecology rights or authority. Ecology will not, however, bring an action
20 against Respondents to recover remedial action costs paid to and received by Ecology under this
21 Consent Order. In addition, Ecology will not take additional enforcement actions against
22 Respondents to require those remedial actions required by this Consent Order, provided
23 Respondents comply with this Consent Order. Ecology reserves the right, however, to require
24 additional remedial actions at the site should it deem such actions necessary. Ecology also
25 reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting
26 from the releases or threatened releases of hazardous substances from the site.

1 XXII. PAYMENT OF EPA OVERSIGHT COSTS

2 1. Following the issuance of this Consent Order, EPA shall submit to
3 Respondents on a periodic basis an accounting of all response and oversight costs incurred by the
4 United States after the effective date of this Order for the implementation of this Order. Such
5 response costs may include, but are not limited to, costs incurred by the United States in
6 overseeing Respondents' implementation of the requirements of this Consent Order and activities
7 performed by the United States as part of this RI/FS, including any costs incurred to obtain
8 access for Respondents pursuant to this Consent Order, and for community relations activities for
9 this RI/FS. Costs shall include all direct and indirect costs, including, but not limited to, time
10 and travel costs of EPA personnel and associated indirect costs, contractor costs, cooperative
11 agreement costs, compliance monitoring, including the collection and analysis of split samples,
12 inspection of RI/FS activities, site visits, discussions regarding disputes that may arise as a result
13 of this Consent Order, review and approval or disapproval of reports, and costs of redoing any of
14 Respondents' tasks. Any necessary summaries, including, but not limited to EPA's certified
15 Agency Financial Management System summary data (SCORES Reports), or such other
16 summary as certified by EPA, shall serve as basis for payment demands. However, Respondents
17 may review the following underlying EPA oversight cost documentation: EPA personnel time
18 sheets, travel authorizations and vouchers; EPA contractor monthly invoices; and all applicable
19 contract laboratory program (CLP) invoices.

20 2. Respondents shall, within 30 days of receipt of each accounting, remit a
21 certified or cashier's check for the amount of the costs set forth in the accounting. If not paid
22 within 30 days of receipt of the accounting, interest shall accrue from the date of receipt of the
23 accounting through the date of payment. The interest rate is the rate of interest on investments
24 for the Hazardous Substances Superfund in section 107(a) of CERCLA, compounded annually
25 on October 1.

26 3. Checks shall be made payable to the Hazardous Substances Superfund and
27 should include the name of the site, the site identification number 10XX, and the title of this
28

1 Consent Order. Checks shall be forwarded to: Mellon Bank, EPA Region 10-Superfund
2 Accounting, P.O. Box 360903M, Pittsburgh, PA 15251.

3 4. Copies of the transmittal letter and check should be sent simultaneously to
4 the EPA Project Coordinator.

5 5. Respondents agree to limit any disputes concerning costs to accounting
6 errors and the inclusion of costs outside the scope of this Consent Order, including, but not
7 limited to, costs for work which is inconsistent with this Order. Respondents shall identify any
8 contested costs and the basis of its objection. All undisputed costs shall be remitted by
9 Respondents in accordance with the schedule set forth above. Disputed costs shall be paid by
10 Respondents into an interest bearing escrow account while the dispute is pending. Respondents
11 bear the burden of establishing an EPA accounting error or the inclusion of costs outside the
12 scope of this Consent Order.

13
14 XXIII. DISCLAIMER

15 1. Respondents deny liability for most of the hazardous substances at the
16 Site, and by entering into this Consent Order, Respondents do not necessarily agree with EPA
17 and Ecology's Findings of Fact and Conclusions of Law. Furthermore, the participation of
18 Respondents in this Order shall not be considered an admission of liability in any judicial or
19 administrative proceeding other than a proceeding by the United States or the State, including
20 EPA and Ecology, to enforce this Consent Order or a judgment relating to it. Respondents retain
21 all of their defenses consistent with this Order to any actions taken by EPA and/or Ecology and
22 otherwise reserve all of their rights to assert claims against other potentially responsible parties
23 and potentially liable persons at the Site. However, Respondents agree not to contest the validity
24 or terms of this Order, or the procedures underlying or relating to it in any action brought by the
25 United States, including EPA, or the state of Washington, including Ecology, to enforce its
26 terms.

XXIV. OTHER CLAIMS

1. In entering into this Order, Respondents waive any right to seek reimbursement under Section 106(b) of CERCLA, 42 U.S.C. § 9606(b). Respondents also waive any right to present a claim under Section 111 or 112 of CERCLA, 42 U.S.C. §§ 9611 or 9612. This Order does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). Respondents further waive all other statutory and common law claims against EPA and Ecology, including, but not limited to, contribution and counterclaims, relating to or arising out of conduct of the RI/FS.

2. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, subsidiary, or corporation not a signatory to this Consent Order for any liability it may have arising out of, or relating in any way to, the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, pollutants, or contaminants found at, taken to, or taken from the Site.

XXV. FINANCIAL ASSURANCE, INSURANCE, AND INDEMNIFICATION

1. Respondents shall separately establish and maintain a financial instrument or trust account or other financial mechanism acceptable to EPA and Ecology, including a demonstration that one or more of the Respondents satisfy the requirements of 40 C.F.R. Part 264.143(f), sufficient to assure the work and any other obligations required under this Consent Order, including a margin for cost overruns. Within fifteen (15) days after the effective date of this Consent Order, Respondents shall fund the financial instrument or trust account sufficiently to perform the work required under this Consent Order projected for the period beginning with the effective date of the Order through 2002. Beginning January 1, 2003, and on or before the 15th calendar day of each calendar year quarter thereafter, Respondents shall fund the financial instrument or trust account sufficiently to perform the work and other activities required under

1 this Order projected for the succeeding calendar year quarter.

2 2. If at any time the net worth of the financial instrument or trust account is
3 insufficient to perform the work and other obligations under the Order for the upcoming quarter,
4 Respondents shall provide written notice to EPA within seven (7) days after the net worth of the
5 financial instrument or trust account becomes insufficient. The written notice shall describe why
6 the financial instrument or trust account is funded insufficiently and explain what actions have
7 been or will be taken to fund the financial instrument or trust account adequately.

8 3. (a) Prior to commencement of any work under this Order, Respondents
9 shall secure, and shall maintain in force for the duration of this Order, and for two (2) years after
10 the completion of all activities required by this Consent Order, Comprehensive General Liability
11 (CGL) and automobile insurance, with limits of \$ five (5) million dollars, combined single limit,
12 naming the United States as additional insured. The CGL insurance shall include Contractual
13 Liability Insurance in the amount of \$ 1 million per occurrence, and Umbrella Liability Insurance
14 in the amount of \$ 2 million per occurrence.

15 (b) Respondents shall also secure, and maintain in force for the
16 duration of this Order and for two (2) years after the completion of all activities required by this
17 Consent Order the following:

18 i. Professional Errors and Omissions Insurance in the amount of
19 \$1,000,000.00 per occurrence.

20 ii. Pollution Liability Insurance in the amount of \$ 1,000,000.00 per
21 occurrence, covering as appropriate both general liability and professional liability arising from
22 pollution conditions.

23 (c) For the duration of this Order, Respondents shall satisfy, or shall
24 ensure that their contractors or subcontractors satisfy, all applicable laws and regulations
25 regarding the provision of employer's liability insurance and workmen's compensation insurance
26 for all persons performing work on behalf of the Respondents, in furtherance of this Order.

27 (d) If Respondents demonstrates by evidence satisfactory to EPA that
28

1 any contractor or subcontractor maintains insurance equivalent to that described above, or
2 insurance covering the same risks but in a lesser amount, then with respect to that contractor or
3 subcontractor Respondents need provide only that portion of the insurance described above
4 which is not maintained by the contractor or subcontractor.

5 (e) Prior to commencement of any work under this Order, and
6 annually thereafter on the anniversary of the effective date of this Order, Respondents shall
7 provide to EPA certificates of such insurance and a copy of each insurance policy.

8 4. At least seven (7) days prior to commencing any work under this Consent
9 Order, Respondents shall certify to EPA that the required insurance has been obtained by that
10 contractor.

11 5. Respondents agree to indemnify and hold the United States and the State
12 of Washington, their agencies, departments, agents, and employees harmless from any and all
13 claims or causes of action arising from or on account of acts or omissions of Respondents, their
14 employees, agents, servants, receivers, successors, assignees, or any persons including, but not
15 limited to, firms, corporations, subsidiaries, and contractors, in carrying out activities under this
16 Consent Order. The United States and the State of Washington or any agency or authorized
17 representative of those governments shall not be held as a party to any contract entered into by
18 Respondents in carrying out activities under this Consent Order.

19
20 XXVI. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

21 1. The effective date of this Consent Order shall be the date it is signed by
22 the later of EPA and Ecology.

23 2. This Consent Order may be amended by mutual agreement of EPA,
24 Ecology and Respondents. Amendments shall be in writing and shall be effective when signed
25 by Respondents, EPA and Ecology. EPA and Ecology Project Coordinators do not have the
26 authority to sign amendments to the Consent Order.

27 3. No informal advice, guidance, suggestions, or comments by EPA or
28

1 Ecology regarding reports, plans, specifications, schedules, and any other writing submitted by
2 Respondents will be construed as relieving Respondents of their obligation to obtain such formal
3 approval as may be required by this Order. Any deliverables, plans, technical memoranda,
4 reports (other than progress reports), specifications, schedules, and attachments required by this
5 Consent Order are, upon approval by EPA and Ecology incorporated into this Order.

6
7 **XXVII. TERMINATION AND SATISFACTION**

8 1. This Consent Order shall terminate when Respondents demonstrate, in
9 writing, and certify to the satisfaction of EPA and Ecology that all activities required under this
10 Consent Order, as amended by any modifications,, including any additional work, payment of
11 oversight costs, and any stipulated penalties demanded by EPA and Ecology, have been
12 performed and EPA and Ecology have approved the certification. This approval shall not,
13 however, terminate Respondents' obligation to comply with Sections XVII, XXI, and XXII of
14 this Consent Order.

15 2. The certification shall be signed by a responsible official representing each
16 Respondent. Each representative shall make the following attestation: "I certify that the
17 information contained in or accompanying this certification is true, accurate, and complete." For
18 purposes of this Consent Order, a responsible official is a corporate official who is in charge of a
19 principal business function.

20
21 **XXVIII. PUBLIC NOTICE OF ORDER**

22 1. WAC 173-340-600(10)(c) requires a thirty (30) day public comment
23 period before this Agreed Order for a RI/FS becomes effective. Any substantial changes to the
24 Order agreed to by the parties, such as future SOWs, shall also be subject to public notice and
25 opportunity to comment. Ecology and EPA shall be responsible for providing such public notice
26 and reserve the right to modify or withdraw any provisions of this Order or any substantial
27 changes to the Order should public comment disclose facts or considerations which indicate to
28

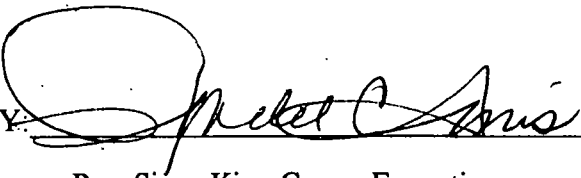
1 Ecology and EPA that the Order or proposed changes to it are inadequate or improper in any
2 respect.

3
4 Respondent Port of Seattle:

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6
7 BY: M.R. Dinsmore DATE: 4-19-2025

8 M.R. Dinsmore, Executive Director
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Respondent King County:

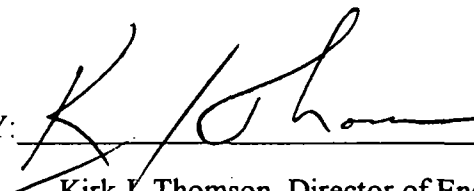
BY:  DATE: 4-19-00
Ron Sims, King County Executive

Respondent City of Seattle:

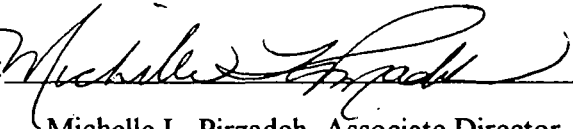
BY: Paul Schell DATE: 4/19/00

Paul Schell, Mayor

Respondent The Boeing Company:

BY:  DATE: 4-19-00
Kirk J. Thomson, Director of Energy & Environmental Affairs

U.S. Environmental Protection Agency, Office of Environmental Cleanup

BY:  DATE: 12/20/00
Michelle L. Pirzadeh, Associate Director

State of Washington, Department of Ecology, Toxics Cleanup Program

BY:  DATE: 12/20/00
James J. Pendowski, Program Manager

Lower Duwamish Waterway Remedial Investigation/Feasibility Study

STATEMENT OF WORK

Prepared for

Lower Duwamish Waterway Group

Port of Seattle

City of Seattle

King County

The Boeing Company

For submittal to

U.S. Environmental Protection Agency

Region 10, Seattle, WA

Washington Department of Ecology

Northwest Regional Office, Bellevue, WA

December 2000

~~CONFIDENTIAL~~
ATTACHMENT A

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INTRODUCTION

This Statement of Work (SOW) is attached to the Lower Duwamish Waterway joint Ecology/EPA Administrative Order on Consent (AOC). The respondents to the AOC are the City of Seattle, King County, The Boeing Company, and the Port of Seattle. The purpose of this SOW is to identify the tasks required to complete a river-wide remedial investigation (RI) and prepare a feasibility study (FS) work plan for the Lower Duwamish Waterway (LDW; see map, Figure 1) (figures and tables are located following the text). To maximize the utility of existing data, the RI will be conducted in two phases. The first phase of the RI will use existing data to provide a framework and process in which to identify locations within the LDW that may be candidates for early action. Early actions may be taken following Phase I. The second phase of the RI will consist of investigations to fill data gaps for the completion of the RI.

A proposed overall process for an LDW Remedial Investigation/Feasibility Study (RI/FS) is presented in Figure 2. The LDW has been the target of extensive environmental sampling. Over the last 5 years, more than 1,000 sediment samples have been collected from the LDW by multiple entities, including the EPA, the National Oceanic and Atmospheric Administration (NOAA), The Boeing Company, King County, the Port of Seattle, the Elliott Bay/Duwamish River Restoration Program (EB/DRP), and the U.S. Army Corps of Engineers (ACOE).

This SOW describes the specific objectives of the Phase I RI, the general objectives of the Phase II RI, and deliverables to be provided for the RI by the respondents. The objectives of the RI are summarized in Table 1.

A proposed schedule for completion of the Phase I RI is presented in Figure 3. This figure also shows the estimated time allotted for agency review of each deliverable. Due to the uncertainty in the specific elements of the Phase II RI, no schedule is shown for this phase in Figure 3. It is anticipated that the Phase II RI could be completed within 18 months following approval of the Phase I RI report. The study objectives for both phases of the RI are identified in Table 1. The RI is broken down into 12 discrete tasks; each is described in a separate section below. Work described in Task 1 will be ongoing throughout the RI process; Tasks 2 to 7 will be completed during Phase I of the RI; Tasks 8 to 13 will be completed during Phase II of the RI. Table 2 gives the list of proposed deliverables for both phases of the RI and the anticipated scheduled agency review time for each Phase I deliverable.

TASK 1 COMMUNICATION

It is anticipated that regularly scheduled meetings of the respondents and the regulatory agencies will be held to review progress during the RI. As appropriate, natural resource trustees and the Lower Duwamish Waterway Community Advisory Group's technical consultant will be included in technical meetings. Following each meeting, email will be sent to all participating parties summarizing the topics discussed.

TASK 2 HISTORICAL REVIEW, SITE CHARACTERIZATION, AND DATA COMPILATION

Prior to beginning data analysis, a comprehensive review of site history, previous and ongoing environmental investigations, physiographic and oceanographic features, biological resources, and demographic characteristics will be conducted for the LDW. This review has several objectives:

- ♦ Identify studies in which data usable for the RI were collected
- ♦ Document investigations of potential chemical sources, source control, and chemical fate and transport
- ♦ Provide a basis for developing the site conceptual model for the ecological risk assessment (ERA) and human health risk assessment (HHRA)

The Phase I RI will use existing chemistry and biological effects data to initially evaluate the nature and extent of contamination in the LDW and to identify potential early action areas. *It is anticipated that sufficient data exist to complete the Phase I RI.*

At a minimum, the following types of data will be assembled from relevant studies and databases and evaluated for possible inclusion in the RI:

- ♦ Sediment chemistry (both bulk and porewater)
- ♦ Summary of pertinent Quality Assurance/Quality Control information from each study
- ♦ Sediment toxicity bioassays
- ♦ Benthic community analyses
- ♦ Salmon life history data
- ♦ Abundance and distribution of biological resources
- ♦ Sensitive and special habitat areas
- ♦ Fish and marine invertebrate home range data/projections
- ♦ Demographic data including socio-economic and ethnicity information

- ♦ Site use information (i.e., public access, commercial, recreational, fish and shellfish consumption, etc.)
- ♦ Potential sources of contamination, including a summary of individual outfalls, surface water, groundwater, stormwater, CSO discharges, and identification of contaminated shoreline fill
- ♦ Tissue chemistry
- ♦ Fish histopathology and biomarker data

Many of the relevant environmental data for the LDW are readily available in electronic format from the Sediment Quality Information System database (SEDQUAL), the Dredge Analysis Information System database (DAIS), and from the electronic archives of the respondents. Data records from these sources will be combined into a single relational database. For this task, the respondents will: 1) develop and submit for agency approval a list of reports to be reviewed for data relevant to the purposes of this RI/FS, 2) develop and submit for agency approval a conceptual design for the database, 3) develop and submit for agency approval criteria for evaluating and accepting data sets, and 4) select data sets to be included in the final database. Electronic copies of the final database, compatible with agency software, will be submitted once a thorough quality assurance review is complete. A memorandum will be prepared and submitted that summarizes the environmental data in the database. This memorandum will also include a list of the datasets excluded from the final database and the reasons for their exclusion.

Geographical information system (GIS) tools will be extensively utilized for data analysis; therefore, all data to be included in the final database must be associated with accurate geographical coordinates. GIS-based maps of station locations and chemical distributions will be prepared as deliverables. The results of the historical review, initial site characterization, and identification of potential early action areas will be included in the Phase I RI report (Task 6). The data file, GIS shapefiles, and meta data will also be provided to the agencies as deliverables.

TASK 3 STUDY DESIGN FOR SCOPING-PHASE RISK ASSESSMENTS

The primary goals of the Phase I RI are to: 1) summarize the existing information concerning the nature and extent of contamination within the LDW, 2) use the existing data, to the extent practical, to identify high priority areas (Task 4), and 3) identify candidate areas for early action (Task 5). These priorities will be established within a framework based on scoping-phase risk assessments for human and ecological health.

The first step in the risk assessments will be to create site conceptual models. Separate models will be created for human and ecological health, although they will be based on similar assumptions. The models will graphically portray the relationships among sources, chemicals, transport mechanisms, and receptors.¹

The conceptual site model for the ERA will include many different organisms that could potentially be impacted by sediment contamination and shows the relationships among species and potential exposure pathways. The conceptual site model for the HHRA will include all potential exposure pathways.

The scoping-phase HHRA and ERA will be conducted in parallel. Study design considerations for each risk assessment are presented in separate sections below.

Scoping-phase human health risk assessment

The scoping-phase HHRA will determine whether chemicals of potential concern found in sediments in the LDW pose unacceptable health risks through fish and shellfish consumption, dermal contact with sediment, and/or direct ingestion of sediment. A key objective will be to develop an exposure assessment that is reasonable, yet protective of the potentially exposed population. At the scoping-phase of the HHRA, site-specific values for many exposure variables may be difficult to determine without additional data collection. For example, exposure parameters used for the fish consumption pathway, such as exposure frequency, exposure duration, and ingestion rates, have not been quantified specifically for the LDW. The scoping-phase assessment will use previously conducted risk assessments from the vicinity of the LDW (Environmental Solutions Group 1999; King County DNR 1999; Weston 1994, 1998) as starting points in assessing risk for the LDW.

Exposure scenarios for adults and children will be evaluated. The representative population groups within each scenario will be those whose potential exposure to site-related chemicals is greatest. For the LDW, these groups are those who consume above-average amounts of fish and shellfish (e.g., members of the Muckleshoot and Suquamish tribes, and Asian and Pacific Islanders) or who fish in the LDW (i.e., Native Americans). In the absence of site-specific data collection, conservative values will be selected for the exposure assessment. Within the exposure assessment, exposure point concentrations (EPCs) will be developed for each exposure pathway evaluated. In general, the area over which EPCs are averaged will reflect spatial use by potential receptors. PCBs and other contaminants of potential concern (COPCs) will be addressed in the scoping-phase HHRA. PCBs in sediments from the LDW have been measured as Aroclors and selected congeners. While the congener data will be used to the extent possible, the primary focus of the scoping-phase risk assessment will be total PCB data as measured by Aroclors.

¹ In risk assessment language, receptors refer to the potentially exposed humans, animals, or plants

The conceptual site model, the exposure assessment, and the toxicity values will be submitted to the agencies as an interim deliverable before the completion of the scoping-phase risk assessment. The exposure assessment will include values for all exposure parameters, including EPCs for chemicals of potential concern.

Scoping-phase ecological risk assessment

Traditionally, the objective of a scoping-phase ERA is to use existing data and conservative assumptions to determine if resident species may be subject to adverse effects from stressors at the site. The ERA, which includes a problem formulation², an analysis phase³, and a risk characterization and uncertainty analysis, provides the basis for focusing further analysis, if justified, on a subset of species, stressors, and pathways by eliminating those that do not appear to be subject to unacceptable risk. Based on the ecological site model, representative species inhabiting the LDW will be selected from each of the key exposure pathways. The process for selecting representative species and endpoints will follow EPA (1998) and other relevant guidance. EPA (1998) outlines three principal criteria for selecting resident species: 1) their ecological relevance, 2) their potential susceptibility to the known or potential stressors, and 3) whether they represent management goals. At a minimum, one or more individual species from each of the following major taxonomic groups will be selected: fish, birds, benthic macroinvertebrates, and mammals.

For each representative species, measures of effect and exposure will be proposed for chemicals of potential concern. For benthic invertebrates, measures of effect and exposure for the scoping phase will be the numerical chemical criteria of the Washington Sediment Management Standards (SMS)⁴ and all relevant benthic tissue effects data. For fish, appropriate technical studies will be reviewed to determine potential associations of chemical concentrations with effects and to assess measures of exposure. For birds and mammals, a simple food-web model will be constructed to calculate potential doses. The model will be based on previous efforts conducted by King County DNR (1999). These doses will be compared to toxicity reference values (TRVs) to estimate risk.

Measures of exposure refer to how exposure is occurring, and are related to chemical fate and transport and life history characteristics of the particular species. Where existing data are insufficient to provide accurate site-specific measures of exposure, conservative assumptions will be made. The measures of exposure are likely to be different for each

² The problem formulation includes the development of assessment endpoints, a conceptual model, and an analysis plan

³ The analysis phase consists of characterizing both ecological exposure and effects

⁴ Chapter 173-204 Washington Administrative Code

representative species. For relatively immobile species such as benthic invertebrates, point estimates of exposure equivalent to a single station location may be appropriate. For mobile species, such as fish and birds, larger spatially averaged concentrations or site usage considerations may be appropriate.

Measures of effect refer to potential adverse impacts to receptor species associated with stressors. Agency databases, peer-reviewed literature, and other relevant toxicological data with appropriate QA/QC documentation will be considered for each of the receptor/stressor combinations. Selected TRVs obtained from secondary sources will be checked using the original primary literature.

PCBs and other COPCs will be addressed in the scoping-phase assessment, particularly for birds and mammals. Total PCBs measured as Aroclors will be used in the scoping-phase assessment, although existing PCB congener data will be used to the extent possible.

The problem formulation for the scoping-phase ecological risk assessment will be submitted to the agencies as an interim deliverable. The problem formulation will consist of a conceptual site model, assessment endpoints, receptors of concern, COPCs and any other stressors under consideration, and the analysis plan for measures of effect and exposure for each representative species. Subsequent to the completion of the problem formulation, draft effect and exposure assessments will be submitted, with proposed exposure concentrations and toxicity data ranges for each receptor species.

Prioritization Methodology for Potential Early Action Areas

A technical memorandum describing the risk-based sediment site prioritization methodology will be submitted to the agencies for review and approval. In identifying high priority areas, the respondents will review sediment site prioritization methodologies that have been used in other similar applications, and will develop a prioritization scheme that adequately represents the range of conditions associated with the potential current risks to human health and the environment. It is anticipated that the selected prioritization methodology will rely on existing environmental data and the results of the scoping-phase risk assessments. Models for prioritizing sediment areas to be evaluated include, among others, those developed by Ecology, EB/DRP, King County, and the Bellingham Bay Pilot Project. The respondents will summarize these approaches and may recommend alternative approaches.

TASK 4 RISK CHARACTERIZATION AND PRIORITY AREA IDENTIFICATION

Following agency approval of the interim deliverables described in Task 3, the scoping-phase risk assessments will be conducted. For each receptor evaluated, the manner in which risks will be characterized and presented is dependent on the specific measures of exposure. The following approaches will be considered, as will other appropriate approaches:

- ♦ For human health, risk estimates will be calculated for both non-carcinogenic and carcinogenic endpoints, depending on the chemical. Separate estimates will be made for each exposure pathway and exposure scenario. In addition, cumulative risk will be evaluated.
 - ♦ Risk estimates for human health from the fish and shellfish consumption pathway will be based on chemical concentrations in muscle or whole-body tissue, as appropriate.
- ♦ For ecological health, the hazard quotient approach⁵ will be used to evaluate potential risk to benthic organisms, fish, birds, and mammals.
 - ♦ For benthic invertebrates, hazard quotients will be calculated using Sediment Quality Standards⁶ and tissue-based risk analysis, as appropriate.
 - ♦ For fish, risk may be characterized based largely on tissue residue values for many of the chemicals of potential concern. Other measures, such as the potential association between chemical concentrations in other environmental media and effects and biological indicators of chemical exposure, may also be considered.
 - ♦ For birds and mammals, risks will be calculated based on predicted doses of chemicals of potential concern compared to TRVs.

The results of the risk characterizations will be used with other risk-based information to make recommendations of high priority areas following the risk-based sediment site prioritization methodology. An uncertainty analysis for each scoping-phase risk assessment will also be conducted.

Priority areas based on the scoping-phase risk assessments will not necessarily be identical for each receptor type, but they are likely to converge on the areas with highest bulk sediment chemical concentrations. The GIS will be used to portray high-priority areas for each receptor simultaneously. Risk-based high priority areas will be considered for potential early action pursuant to Task 5. The scoping-phase risk assessment reports will be finalized within the Phase I RI report (Task 6).

⁵ Hazard quotients are calculated by dividing the measure of exposure by the measure of effect; both must be in the same units

⁶ Chapter 173-204 Washington Administrative Code

TASK 5 IDENTIFICATION OF CANDIDATE AREAS FOR EARLY ACTIONS

Following completion of the sediment prioritization process described in Task 4, management criteria for identifying high priority areas as candidate areas for early action will be developed. Selection criteria will include, but not be limited to, factors such as the priority relative to areas with lower potential ecological and human health risks, the degree of uncertainty in prioritization, the potential for recontamination, and the potential qualitative impact on LDW-wide risks if the area were remediated. Impediments to early action, including habitat alteration issues and landowner constraints, will also be considered. Two technical memoranda will be submitted to the agencies for review and comment: 1) description of selection criteria and 2) data analysis and identification of candidate areas for early action.

TASK 6 PHASE I RI REPORT PRODUCTION

A Phase I RI report will be finalized following completion of all data analyses and the identification of potential areas for early action. The Phase I RI report will:

- ♦ Summarize the characteristics and history of the LDW
- ♦ Summarize previous environmental investigations, including studies related to groundwater and source control
- ♦ Summarize the nature, extent, and sources of contamination affecting the LDW, to the extent possible using existing data
- ♦ Summarize the quantity and quality of data collected and reviewed
- ♦ Present the results of the scoping-phase HHRA and ERA
- ♦ Summarize the process and methods used to determine high priority areas within the LDW based on sediment quality and the scoping-phase HHRA and ERA
- ♦ Identify areas classified as high priority and candidate areas for early action
- ♦ Present an initial identification of ARARs

Deliverables for Task 6 include a draft Phase I RI Report, which will be submitted to the agencies for review and comment, and a final version of the report, once all comments have been addressed.

TASK 7 IDENTIFICATION OF DATA NEEDED TO COMPLETE THE RI

Upon completion of the Phase I RI report and approval of the report by EPA and Ecology, the respondents will identify additional data that may be required to complete the RI. Data gaps will be identified based on an analysis of the uncertainties associated with summarizing the nature and extent of contamination, HHRA exposure parameters, and the results of the scoping-phase risk assessments. In addition, the scoping-phase risk assessments will be used to assess residual risks at the completion of proposed early actions. Data gaps related to addressing risk characterization uncertainties and data that may be needed for management decisions will be prioritized. Costs for collecting these data will also be a consideration. A technical memorandum will be prepared that will identify data gaps in detail, and discuss whether the data gaps should be further investigated. The memorandum will be submitted to the agencies for review and comment.

TASK 8 PREPARE PHASE II RI WORK PLANS

July

After receiving comments from the agencies on the technical memorandum addressing data gaps, the respondents will prepare draft and final Work Plans describing the studies to be conducted as part of the Phase II RI. One component of these studies will be high-resolution analysis for dioxin-like PCB congeners on a subset of environmental samples that will be required to make final risk-based management decisions.

TASK 9 PREPARATION OF PROJECT PLANS FOR CONDUCTING ADDITIONAL STUDIES

Study designs and methods for additional data collection efforts will be documented in project plans, including Sampling and Analysis Plans (SAPs), Quality Assurance Project Plans (QAPPs), and Health and Safety Plans (HSPs), as appropriate. These plans will be submitted for agency review and approval. Preparation of these plans will follow guidance produced by EPA (1999) and Ecology (1991, 1995).

TASK 10 IMPLEMENT ADDITIONAL STUDIES

Once the appropriate project plans are approved by the agencies, the studies will be conducted. Following the completion of each study, a report will be completed and submitted to the agencies, which describes the specific activities accomplished, noting any deviation from the project plans. All deviations from project plans must be approved by EPA and Ecology in advance. Once the data are reviewed and validated, a data report for each study will be prepared and submitted to the agencies.

TASK 11 CONDUCT BASELINE AND RESIDUAL RISK ASSESSMENTS

Baseline and residual HHRA and baseline and residual ERAs will be conducted once the needed data identified in Task 7 have been collected. The risk assessments will be conducted for two exposure regimes: 1) baseline sediment conditions as they exist at the time the RI assessments are done and 2) residual sediment conditions accounting for the effects of the planned early action projects. The latter assessment will be conducted by using characteristics that the sediments will have following planned early actions, as well as characteristics of sediments in unremediated areas, for the exposure assessment. This assessment will provide an estimate of residual risks following early actions, and will be used to determine whether remedial actions, beyond the early actions, are warranted. Because some of the early actions may not be completed when the residual risk assessment is conducted, some uncertainty will remain regarding associated ecological and human health risk reduction. An interim deliverable will be submitted to the agencies to outline an approach for predicting exposures in the post-early action exposure regime.

These risk assessments will refine risk estimates made during the scoping-phase risk assessments through a variety of techniques, including:

- ♦ increased sample size for estimating exposure
- ♦ direct, rather than estimated, measurements of exposure and effect
- ♦ additional exposure scenarios
- ♦ more sophisticated food web modeling
- ♦ probabilistic risk characterization and uncertainty analysis

The fundamental study design will be similar to the scoping-phase risk assessments, but there will be added complexity in some areas. Accordingly, the deliverables specified in Task 3 (conceptual site models, exposure assessments, and problem formulation) will be revised and submitted to the agencies for review.

Draft baseline and residual HHRA and ERA reports will be submitted to the agencies for review and comment. The final baseline and residual risk assessment reports will be included in the Phase II RI report (Task 12).

TASK 12 PHASE II RI REPORT PRODUCTION

The Phase II RI report will include a presentation of all data collected during Phase II and a complete evaluation of the nature and extent of contamination. The final baseline and residual risk assessments for human and ecological health will also be included. The report will describe a process for identifying potential ARARs and remedial actions beyond the early actions identified in the Phase I RI. In addition, the report will specify the risk-based ARARs and other ARARs directly related to the completion of the RI. The draft Phase II RI report will be submitted to the agencies for review and comment. A final version of the report will be submitted once all comments have been addressed.

TASK 13 RIVER-WIDE FEASIBILITY STUDY WORK PLAN

As part of the RI, respondents will prepare a work plan to conduct a river-wide FS. The work plan will be based on the appropriate EPA and Ecology guidance documents for conducting a FS. The FS will include identifying and screening remedial alternatives based on the general range of Duwamish Waterway sediment characteristics (e.g., sediment grain size and TOC), waterway conditions (e.g., water depth, range of flow, and salinity range), and contaminants of concern. The FS work plan will also include a task to develop a detailed comparative analysis of the alternatives to identify those that might be candidates for remedial activities that might be undertaken at the site.

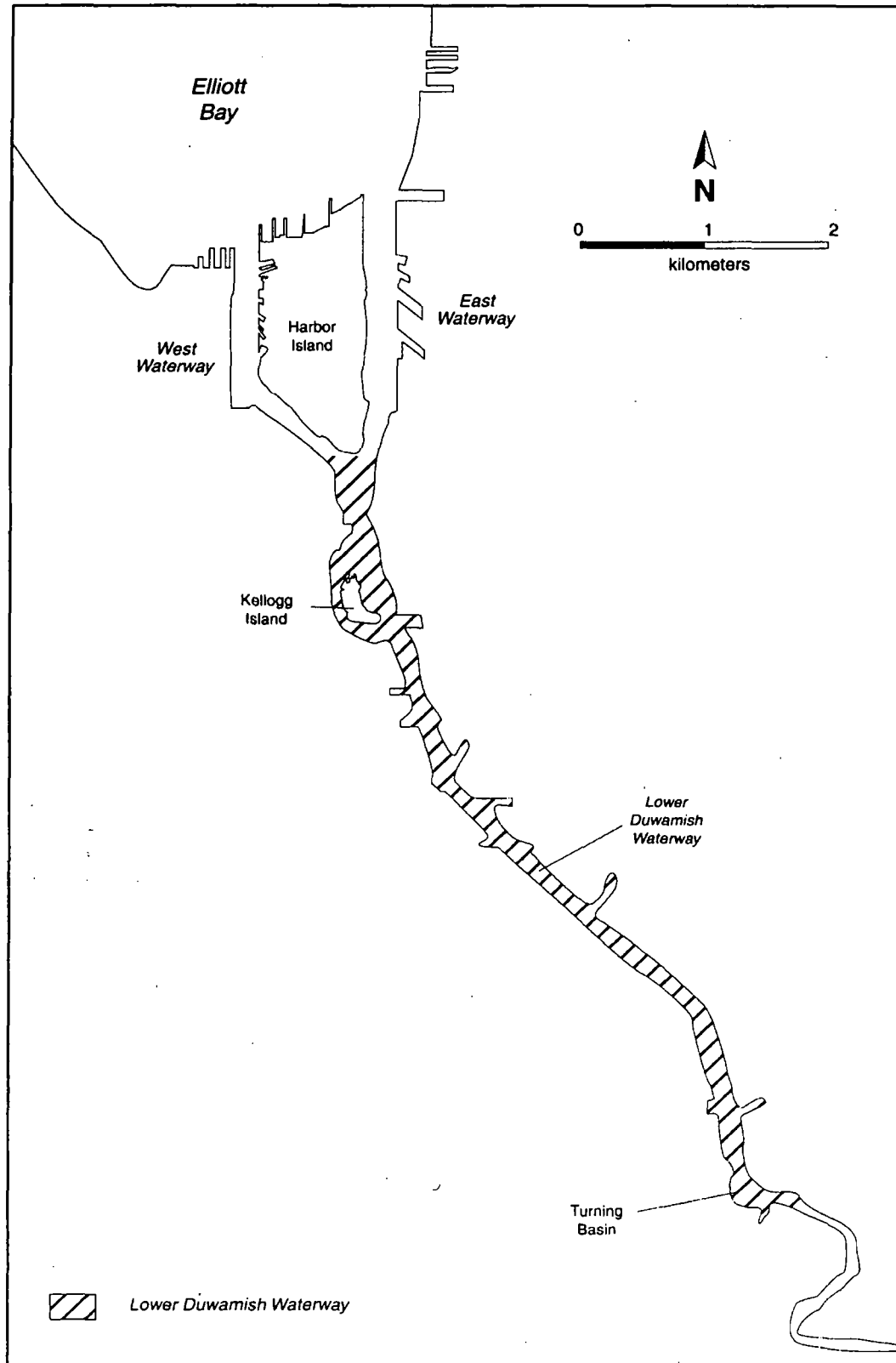


Figure 1. Lower Duwamish Waterway (LDW)

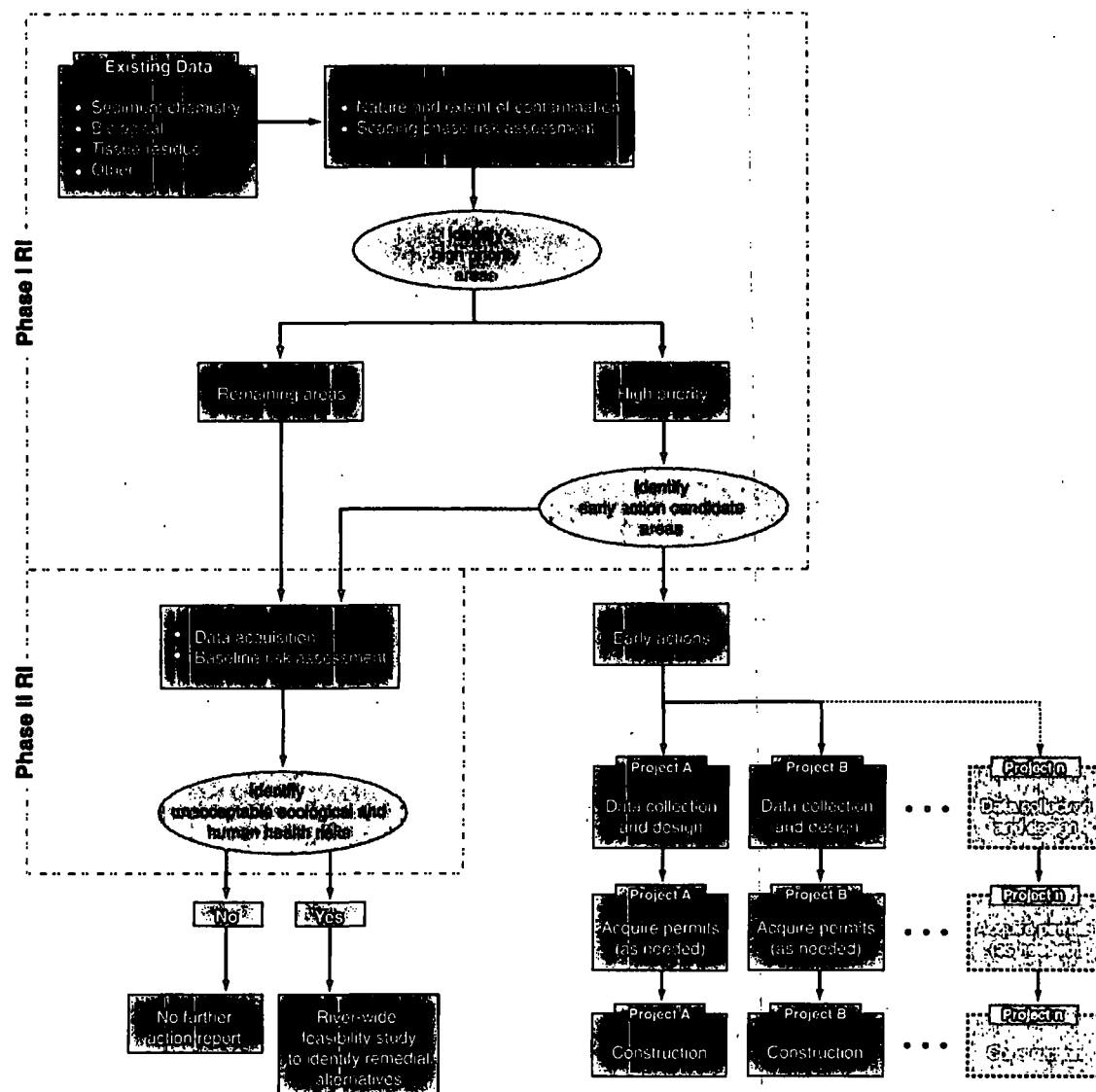


Figure 2. Flowchart of tasks for the Lower Duwamish Waterway RI/FS

Lower Duwamish Waterway Remedial Investigation Phase I Timeline

Page 1 of 1

Months from Project Inception

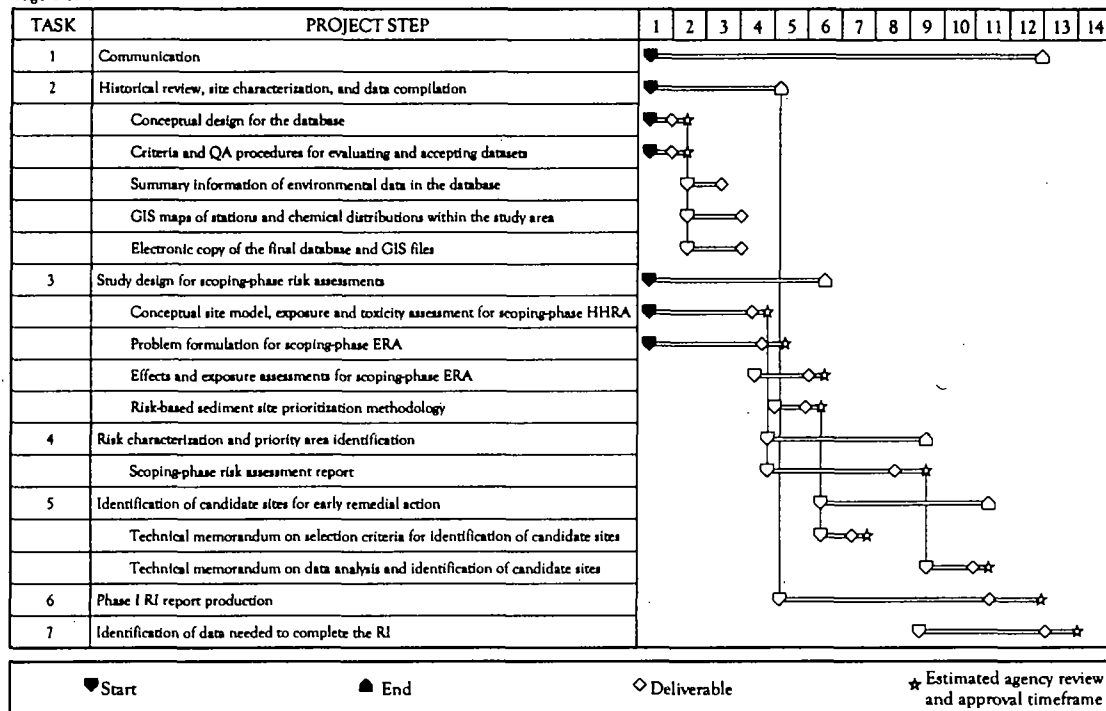


Figure 3. Anticipated schedule for the Lower Duwamish Waterway Phase I RI
[timeline edited and reinserted]

Table 1. Remedial Investigation objectives

Phase I	- Summarize and compile existing data concerning historical environmental investigations and the source, nature, and extent of contamination within the LDW - Use existing data to conduct scoping-phase ERA and HHRA - Identify areas potentially suitable for early actions - Identify additional data necessary to complete the river-wide RI - Prepare Work Plans as needed to complete the river-wide RI
Phase II	- Prepare documentation (SAP, QAPP, HSP) for any additional studies - Implement additional studies to fill data gaps - Use data from additional studies to determine baseline risk in the absence of any early actions, and to determine residual risks assuming all early actions have been conducted - Identify areas where residual risks are above acceptable levels - Prepare Work Plan for river-wide FS

Table 2. List of deliverables⁷**TASK 1: COMMUNICATION**

No work products are anticipated for this task

PHASE I RI**TASK 2: HISTORICAL REVIEW, SITE CHARACTERIZATION, AND DATA COMPILATION**

Conceptual design for database - 10 working days for agency review

Criteria for evaluating and accepting data sets - 10 working days for agency review

List of reports for historical site characterization - 10 working days for agency review

Summary information of environmental data in the database

GIS-based maps of stations and chemical distributions within the LDW

Electronic copy of the final database and GIS files

TASK 3: STUDY DESIGN FOR SCOPING-PHASE RISK ASSESSMENTS

Draft conceptual site model, exposure assessment, and toxicity values for scoping-phase HHRA - 10 working days for agency review

Draft problem formulation for scoping-phase ERA - 20 working days for agency review

Draft effects and exposure assessments for scoping-phase ERA - 10 working days for agency review

Risk-based sediment prioritization methodology - 10 working days for agency review

TASK 4: RISK CHARACTERIZATION AND PRIORITY AREAS IDENTIFICATION

Draft scoping-phase risk assessment report - 30 working days for agency review

TASK 5 IDENTIFICATION OF CANDIDATE AREAS FOR EARLY ACTION

Technical memorandum on selection criteria for identification of candidate areas - 10 working days for agency review

Technical memorandum on data analysis and identification of candidate areas - 10 working days for agency review

TASK 6 PHASE I RI REPORT PRODUCTION

Draft and final Phase I RI report - 45 working days for agency review

TASK 7 IDENTIFICATION OF DATA NEEDED TO COMPLETE THE RI

Draft technical memorandum identifying additional data needs for RI

TASK 8 PREPARATION OF PHASE II RI WORK PLANS

Draft and final Phase II RI Work Plans describing additional studies to be conducted

PHASE II RI**TASK 9 PREPARATION OF PROJECT PLANS FOR CONDUCTING ADDITIONAL STUDIES**

Draft and final project plans, as necessary (SAPs, QAPPs, HSPs)

TASK 10 IMPLEMENT ADDITIONAL STUDIES

Field report for each study

Data report for each study

[continues overleaf]

⁷ Anticipated agency review time for planning purposes only

Table 2, continued

TASK 11 CONDUCT BASELINE AND RESIDUAL RISK ASSESSMENTS

Approach for estimating post early action exposure regime

Conceptual site model and exposure assessment for baseline and residual HHRA

Problem formulation for baseline and residual ERA

Baseline and residual risk assessment reports

TASK 12 PHASE II RI REPORT PRODUCTION

Draft and final Phase II RI report

TASK 13 RIVER-WIDE FS WORK PLANDraft and final river-wide FS work plan

REFERENCES

- Ecology. 1991. Guidelines and specifications for preparing Quality Assurance Project Plans. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Quality Assurance Section, Manchester, WA. May 1991. 91-16.
- Ecology. 1995. Sediment sampling and analysis plan appendix. Washington State Department of Ecology, Sediment Management Unit, Lacey, WA. Prepared by PTI Environmental Services, Bellevue, WA. December 1995.
- Environmental Solutions Group. 1999. Waterway Sediment Operable Unit, Harbor Island Superfund Site. Assessing human health risks from the consumption of seafood: human health risk assessment report. Prepared for Port of Seattle, Lockheed Martin, Todd Pacific Shipyards. Environmental Solutions Group, Seattle, WA.
- EPA. 1998. Guidelines for ecological risk assessment. EPA/630/R-95/002-F. U.S. Environmental Protection Agency, Risk Assessment Forum, Washington, D.C.
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- King County DNR. 1999. King County combined sewer overflow water quality assessment for the Duwamish River and Elliott Bay. Prepared by King County Department of Natural Resources Wastewater Treatment Division and Water and
- Weston. 1994. Remedial investigation report, Harbor Island (Part 2 – Sediment). Volume I. Prepared for the U.S. Environmental Protection Agency, Region 10, Seattle, WA. Roy F. Weston, Seattle, WA.
- Weston. 1998. Remedial investigation report, Pacific Sound Resources, Marine Sediments Unit, Seattle, Washington. Volume I. Prepared for the U.S. Environmental Protection Agency, Region 10, Seattle, WA. Roy F. Weston, Seattle, WA.

ATTACHMENT B

**INTERIM GUIDANCE ON ORPHAN SHARE COMPENSATION
FOR SETTLORS OF REMEDIAL DESIGN/ REMEDIAL ACTION AND
NON-TIME-CRITICAL REMOVALS**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

401 M Street, S.W.

Washington, D.C. 20460

INTERIM GUIDANCE ON ORPHAN SHARE COMPENSATION FOR SETTLORS OF REMEDIAL DESIGN/REMEDIAL ACTION AND NON-TIME CRITICAL REMOVALS

Policy Statement and Purpose

On October 2, 1995, Administrator Browner announced the third in a series of reforms designed to fundamentally change the way EPA implements the Superfund program. Several of these Superfund Reforms are intended to provide greater fairness, reduce litigation and transaction costs, and promote private party cleanup of Superfund sites. One of the cornerstones of the October announcement was the Agency's initiative to exercise its enforcement discretion to provide orphan share compensation at sites where potentially responsible parties (PRPs) agree to perform the cleanup.

The purpose of this interim guidance is to provide Regions with further direction for providing orphan share compensation in settlements with PRPs. This guidance makes clear that, where EPA determines that there is a share which may be equitably attributed to parties who are insolvent or defunct (*i.e.*, the "orphan share") and which would ordinarily be allocated to viable PRPs under principles of joint and several liability, EPA intends to consider this factor in its assessment of the federal compromise it provides in settlement.¹ EPA anticipates that its willingness to contribute to settlement, based in part upon an increased emphasis on the effect of an orphan share, will facilitate settlement with performing parties.

Of course, the Region's consideration of an "orphan share" is only one component of a Region's settlement analysis. Consistent with our historic practice, the total amount of federal compromise in settlement incorporates other factors in addition to the presence or absence of an orphan share, including: (1) litigation or other risks to recovery or performance; (2) cooperation of performing parties; and (3) the resources of parties. This guidance simply establishes limits upon the amounts the Regions may provide as orphan share compensation in light of current fiscal limitations. This policy preserves the application of common law tort principles of joint and several liability by recognizing the impact of joint and several liability in the settlement analysis factors where EPA determines that an orphan share at a given site may be greater than de minimis.

¹ This guidance is intended for settlement purposes only and, therefore, orphan share compensation is appropriate only where settlement occurs. In the event that settlement does not occur, Regions should, as appropriate, pursue PRPs jointly and severally for their performance of cleanup and recovery of response costs. Courts have uniformly found that CERCLA liability is joint and several where the harm is indivisible, which ensures that the costs of cleanup are borne by the parties who contributed to the contamination, rather than the tax-paying public. This guidance does not apply where EPA determines or a court finds that PRPs have met their substantial burden of proving as a defense to joint and several liability that the harm is divisible and reasonably capable of apportionment.

Background

Under CERCLA's joint and several liability system, at sites where there are insolvent or defunct parties who cannot contribute to the cost of cleanup, viable PRPs are required to absorb the shares that may be attributable to such non-viable PRPs. In an effort to mitigate this effect and encourage PRPs to perform cleanup, EPA committed in the October 1995 announcement to compensate performing parties for a limited portion of the orphan share in future cleanup settlements. The Agency stated that this compensation might be accomplished through forgiveness of past costs and of projected oversight costs, and would necessarily be subject to the amount of funding available for the program.

Since the October announcement, however, Congress has not reauthorized Superfund, nor has it provided the Agency with a separate appropriation for orphan share compensation. In addition, Congress has not yet reinstated the Superfund taxing authority -- the principal source of revenue for the Superfund Trust Fund -- which expired at the end of 1995. Until these taxes are reinstated, the Trust Fund will continue to be depleted by costs expended to implement the program and achieve cleanups. Because of this lapse in taxing authority and absence of specific orphan share funding in the FY 96 appropriation, EPA examined ways to compensate a portion of the orphan share within existing appropriations.

EPA also determined that it was important to provide incentives for parties to voluntarily perform cleanups, provide the benefits of this reform to as many qualifying sites as possible, recognize cooperative parties, keep transaction costs low, and use readily available information. Finally, the Agency wants to provide appropriate balance between preserving the Trust Fund and providing meaningful implementation of this reform. Based on these considerations, EPA developed a process that would enable the Regions to implement this reform this fiscal year.

Applicability

This reform applies where: (1) EPA initiates or is engaged in on-going negotiations for a remedial design or remedial action (RD/RA) at a site or for a non-time-critical (NTC) removal at a National Priorities List (NPL) site under the Superfund Accelerated Cleanup Model (SACM); (2) a PRP or group of PRPs agrees to conduct the RD/RA or RA pursuant to a consent decree or the NTC removal pursuant to an administrative order on consent (AOC) or consent decree; and (3) an "orphan share" exists at the site.² For the purposes of this reform, the term "orphan share" refers to that share of responsibility which is specifically attributable to identified parties EPA has determined are: (1) potentially liable; (2) insolvent or defunct; and (3) unaffiliated with any party potentially liable for response costs at the site. This definition of orphan share does not include shares due to, for example: (1) unallocable waste; (2) the difference between a party's

² This guidance is not intended to apply at sites where the only PRPs at the site currently or formerly owned or operated the facility or at federal facilities.

share and its ability to pay; or (3) those parties, such as “de micromis” contributors, municipal solid waste (MSW) contributors or certain lenders or residential homeowners, that EPA would not ordinarily pursue for cleanup costs. See “Policy on CERCLA Enforcement Against Lenders and Government Entities that Acquire Property Involuntarily” (Sept. 22, 1995); “Policy Toward Owners of Property Containing Contaminated Aquifers” (May 24, 1995); “Guidance on CERCLA Settlements with De Micromis Waste Contributors,” OSWER Directive No. 9834.17 (July 30, 1993); “Policy Toward Owners of Residential Property” (July 3, 1991); “Interim Policy on CERCLA Settlements Involving Municipalities and Municipal Wastes” (Dec. 6, 1989).

A party may be considered to be “insolvent” if EPA determines that a party has no ability to pay. A party may be considered to be “defunct” if: (1) the entity has ceased to exist or ceased operations; and (2) the entity has fully dissipated its assets such that the party has no ability to pay. For both the insolvent and the defunct determinations, EPA’s investigation must indicate that there is no successor or other affiliated party that is potentially liable.

Methods for Determining Appropriate Orphan Share Component of Federal Compromise

Compensation for the orphan share component of the federal compromise in settlement may be provided through forgiveness of past costs and reduction of liability for future oversight costs.³ At some sites, forgiveness of some portion of past costs already may have occurred in conjunction with a prior settlement with PRPs at the site. In such cases, those past costs which have been forgiven would not be available for use as compensation under this reform with respect to the same PRPs.

To determine the appropriate orphan share component of the federal compromise at a particular site, Regions should make a rough estimate of the size of the orphan share. At many sites, an estimated range will be sufficient to determine whether the share which may be equitably attributed to insolvent and defunct parties warrants federal compromise. Using total site costs,⁴ Regions should estimate the orphan share based upon equitable factors, such as the

³ Although mixed funding might have been used as compensation under this reform, EPA did not receive a separate appropriation for orphan share compensation and, therefore, any mixed funding provided under this reform would have reduced the funds available for cleanups. As a result, compensation under this reform does not include mixed funding. However, this guidance is not intended to modify or alter EPA’s enforcement discretion to enter into mixed funding agreements under Section 122(b) of CERCLA, 42 U.S.C. § 9622(b).

⁴ “Total site costs” refer to outstanding past costs and future oversight costs at the site or operable unit that is the subject of the ROD or NTC removal and projected ROD or NTC removal costs.

Gore factors.⁵ To ensure that implementation of this reform does not impede cleanup, cause a delay in statutory negotiation deadlines, or result in increased transaction costs, Regions should rely upon readily available or easily obtainable information in making this estimation.

Given current financial constraints, EPA is limiting the amount that Regions can offer in compensation for the orphan share component of the federal compromise to 25 percent of projected ROD remedy/NTC removal costs. First, EPA determined that such a limitation is necessary to moderate the impact on the Trust Fund in light of the expiration of the taxing authority and lack of separate orphan share appropriation. Second, EPA believes that a 25 percent limitation will minimize the incurrence of additional transaction costs and the delay in cleanup negotiations associated with calculation of the orphan share. Finally, a 25 percent limitation will ensure a fairer distribution among sites because it represents the amount at which most sites will have sufficient past costs and future oversight costs to provide compensation for the orphan share component of the federal compromise in settlement.

Accordingly, Regions should maximize compensation for the orphan share component of the federal compromise as long it does not exceed any of the following: (1) the orphan share; (2) the sum of all unreimbursed past costs and EPA's projected costs of overseeing the design and implementation of the Record of Decision (ROD) remedy or NTC removal costs; or (3) 25 percent of the projected ROD remedy or NTC removal costs at the site. This will be considered the maximum amount appropriate for compensating the orphan share component of the federal compromise under this policy.

There is a presumption that Regions will provide the maximum amount appropriate for the orphan share component of the federal compromise. However, in limited circumstances, Regions may, in their discretion, decide that compensation less than the maximum amount is appropriate after consideration of equitable factors, including: (1) PRP fairness to other PRPs, including small businesses, MSW parties, small volume waste contributors and certain lenders and homeowners; (2) PRP cooperation; and (3) size of the orphan share. Regions should give greater consideration to these factors when activities encompassed by the factors occur after issuance of this guidance.

⁵ The "Gore factors" are usually relied upon by courts in making equitable allocations in contribution actions. They include: (1) the amount of hazardous substances involved; (2) the degree of toxicity of the substances; (3) the degree of involvement by parties in the generation, transportation, treatment, storage, or disposal of the substances; (4) the degree of care exercised by the parties with respect to the substances; and (5) the degree of cooperation of the parties with government officials to prevent any harm to public health or the environment. See, e.g., Env'tl. Transp. Servs. v. Ensco, Inc., 969 F.2d 503 (7th Cir. 1992).

Implementation

When providing notice of forthcoming negotiations to PRPs or during on-going negotiations, Regions should indicate whether the site is eligible for this reform and should share any available information about the maximum amount appropriate for compensation. Regions may request PRPs to submit information regarding the size of the orphan share at the site, including a basic rationale and supporting documentation.

Headquarters pre-approval will be required for any settlement at a site where the projected ROD remedy or NTC removal cost exceeds \$30 million. To satisfy this pre-approval requirement, Regions should contact Headquarters, either orally or in writing, prior to conveying a formal settlement offer to a PRP or group of PRPs that includes an orphan share compensation component. Headquarters will then evaluate such proposed compensation in light of site-specific factors, state concerns and national priorities, including meaningful implementation of the reform and impact on the Trust Fund.

For all sites, an analysis of the proposed orphan share compensation provided through forgiveness of past costs and reduction of liability for future oversight costs should be included in the enforcement confidential ten-point settlement analysis submitted to Headquarters. This guidance is not intended to limit EPA's consideration of other settlement factors. The Regions may elect to compromise a greater or lesser amount than that described herein, based upon other factors they would consider in their routine settlement analyses, such as litigation or other risks to recovery or performance, cooperation of the performing parties, and the resources of parties.

Orphan Share Assistance Team

We have established an orphan share assistance team with the Department of Justice to assist Regions in implementation of this important reform. The team will be in contact with Regional staff to resolve issues to ensure results.

For further information concerning this guidance, please contact either Susan Boushell (202-564-5107) or Patricia Mott (202-564-5133) in the Office of Site Remediation Enforcement.

Purpose and Use of this Guidance

This guidance and any internal procedures adopted for its implementation are intended exclusively as guidance for employees of the U.S. Environmental Protection Agency. This guidance is not a rule and does not create any legal obligations. Whether and how EPA applies the guidance to any particular site will depend on the facts at the site.

Addendum to the "Interim CERCLA Settlement Policy" Issued on December 5, 1984**Background**

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), liability is strict, joint and several unless the harm is shown to be divisible. Accordingly, viable potentially responsible parties (PRPs) sometimes have to absorb shares of responsibility that might otherwise be equitably attributed to PRPs who are insolvent or defunct and thus unable to contribute to the costs of cleanup. In order to reduce litigation, encourage PRPs to perform cleanup, and enhance the overall fairness of the Superfund program, the U.S. Environmental Protection Agency (EPA) announced in October 1995 its intention to compensate for a portion of this "orphan share" at sites where PRPs enter into settlements to perform cleanup.

To implement this reform, on June 3, 1996, EPA issued an "Interim Guidance on Orphan Share Compensation for Settlers of Remedial Design/Remedial Action and Non-Time-Critical Removals." Under that policy, EPA will "compensate" parties that agree to perform a remedial action or non-time-critical removal for a portion of the share specifically attributable to insolvent or defunct PRPs, up to 25% of the projected remedy or non-time-critical removal costs, or the total past and future oversight costs, whichever is less. These limitations were included because they moderate the impact on the Trust Fund and minimize the incurrence of additional transaction costs, particularly with respect to calculation of the orphan share.

Policy Statement

When assessing a proposed cost recovery settlement for less than 100% of response costs, the Regions should continue to consider inequities and aggravating factors, litigative risks in proceeding to trial, and the rest of the ten settlement criteria set forth in the "Interim CERCLA Settlement Policy." At sites involving potentially liable insolvent or defunct parties, the Regions may consider the existence of a significant orphan share as an "inequity" or "aggravating factor" within the meaning of the 1984 policy. Any exercise of the Government's discretion to accept a cost recovery settlement offer containing a compromise on this basis will necessarily be a case-by-case decision, to be made after examination of a variety of factors. Among the factors to be considered in determining whether and to what extent to compromise a claim based on the existence of insolvent or defunct parties are the following: (1) the size of the orphan share; (2) the settling PRP's cooperation with the government and other PRPs; and (3) fairness to other parties.

It is the intent of EPA and the Department of Justice that the United States should not enter into settlements that provide incentives or precedents for parties to refuse to enter into agreements for performance of work, believing they may get a better settlement at the time EPA pursues a cost recovery claim. EPA should provide strong incentive for parties to conduct cleanups rather than wait until EPA pursues cost recovery claims. Therefore, except in

extraordinary cases, EPA should not offer an orphan share compromise in a cost recovery settlement to a party that refused a previous settlement offer that included a compromise based on orphan share considerations.¹ Moreover, except in extraordinary cases, a party that does not perform work under a consent agreement should not receive a greater compromise of response costs in a cost recovery settlement based on the existence of an orphan share than it would have received if (1) the party had signed a consent agreement to perform the work, and (2) the orphan share policy had been applied.²

In resolving cost recovery claims, recognition of equitable considerations, including the existence of a significant orphan share, is for settlement purposes only. Where there is indivisible harm, EPA will continue to pursue non-settling parties jointly and severally for all response costs.

Use and Purpose of this Addendum

This policy addendum and any internal procedures adopted for its implementation are intended exclusively as guidance for employees of the U.S. Environmental Protection Agency and the U.S. Department of Justice. This addendum is not a rule and does not create any legal obligations. Whether and how EPA and the Department of Justice apply the guidance set forth in this addendum in any particular case will depend on the facts of the case.

For further information about this addendum, please contact Laura Bulatao (202-564-6028) or Deniz Ergener (202-564-4233) in EPA's Office of Site Remediation Enforcement, or Bob Brook in the Environmental Enforcement Section of the Department of Justice at (202) 514-2738.

¹ For purposes of this addendum and effective upon its issuance, the determination that a case is extraordinary requires the prior written approval of OECA. EPA intends that this requirement will be incorporated into the next set of revisions to the May 19, 1995 memorandum entitled "Office of Enforcement and Compliance Assurance and Regional Roles in Civil Judicial and Administrative Site Remediation Enforcement Cases" (commonly known as the "Roles Memo").

² See footnote 1.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION X
STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

IN THE MATTER OF:)

Lower Duwamish Waterway)

Port of Seattle, King County,)
City of Seattle, The Boeing Company,)

RESPONDENTS)

FIRST AMENDMENT

Proceeding Under Sections 104, 122(a),)
122(d)(3) of the Comprehensive)
Environmental Response, Compensation,)
and Liability Act (CERCLA), as amended,)
42 U.S.C. §§ 9604, 9622(a), 9622(d)(3) and Under the)
Washington State Model Toxics Control Act)
(MTCA), ch. 70.105D RCW.)

U.S. EPA, Region 10
Docket No. CERCLA-
10-2001-0055

Ecology Docket No.
00TCPNR-1895

This First Amendment to the Administrative Order on Consent For Remedial Investigation/ Feasibility Study (AOC) for the Lower Duwamish Waterway (LDW), CERCLA Docket No. 10-2001-0055, issued on December 20, 2000, provides for the performance of the Fishers Study Scope of Work set forth below under the terms and conditions of the AOC by mutual agreement of the Parties in accordance with Section XXVI of the AOC.

This Scope of Work (SOW) for the fishers study for the Lower Duwamish Waterway (LDW) provides a general overview of the work to be performed, a list of deliverables by task, and a schedule for these deliverables.

The goal of the fishers study, consistent with the LDW Fishers Study Road Map, is to gather information from people who either consume seafood from the LDW or who may assist in understanding aspects of LDW seafood consumption in order to improve the effectiveness of the institutional controls needed regarding the seafood consumption pathway. The study is not intended to generate quantitative seafood consumption rates. In addition, risk communication/outreach measures to be implemented during or following the fisher study are not included in this scope; these measures will be explored using different mechanisms and potentially with different parties or groups.

The tasks of the fishers study are summarized in Figure 1 and described briefly below.

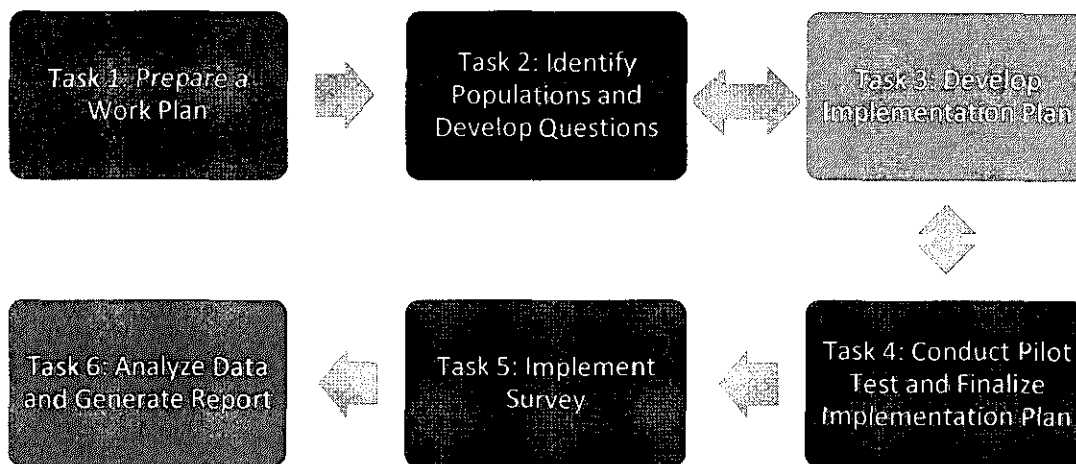


Figure 1. Tasks for the LDW fishers study

- ◆ **Task 1. Prepare a Work Plan.** LDWG will review existing data and draft a work plan for the survey. The draft work plan will be reviewed by EPA/Ecology and finalized following AOC procedures. LDWG will also notify EPA and Ecology of the names, titles, and qualifications of any contractors being used following the procedures in Section VIII of the AOC.
- ◆ **Task 2: Identify Populations and Develop Questions.** LDWG will compile a draft set of survey questions that will be discussed at a community experts workshop.
- ◆ **Task 3: Develop Implementation Plan.** LDWG will draft an implementation plan that will specify the questions to be asked and how the questions will be asked during the survey. The implementation plan will also specify the approach for the pilot test and how the results of the pilot test will be incorporated into the year-long study. The draft implementation plan will be reviewed by EPA/Ecology following AOC procedures.
- ◆ **Task 4: Conduct Pilot Test and Finalize Implementation Plan.** A small pilot test will be conducted to field test the survey to determine if any revisions are needed. Cultural competency training of interviewers will be conducted, if needed. The implementation plan will be revised by LDWG and submitted for approval by EPA/Ecology following AOC procedures.
- ◆ **Task 5. Implement Survey.** The survey will be conducted by the contractor with LDWG oversight for one year to capture seasonal variability.
- ◆ **Task 6. Analyze Data and Generate Report.** LDWG will prepare a draft data report for review by EPA/Ecology. The report will be revised as needed and finalized and approved per the AOC process. Hard copies of survey results will also be submitted (separately) with identifiers removed to protect the privacy of interviewed individuals.

Table 1 provides a schedule, by task, for the completion of deliverables for the LDW fishers study. Project deliverables will be finalized per the Administrative Order on Consent (AOC) process.

Table 1. Schedule for task deliverables

Task	Deliverable	Schedule
Task 1	Notify EPA and Ecology of contactors/subcontractors	Prior to work commencing
	draft work plan	30 working days after approval of Service Directive
	final work plan	30 working days from the receipt of EPA/Ecology comments
Task 2	none	Initiated after final approval of the work plan
Task 3	draft implementation plan	45 working days after workshop in Task 2
Task 4	final implementation plan	30 working days from the receipt of EPA/Ecology comments on revised draft
Task 5		Initiated after final implementation plan approval
Task 6	draft data report	60 working days after completion of year-long survey in Task 5
	final data report	45 working days from the receipt of EPA/Ecology comments

Note: Progress reports will be submitted monthly for the duration of the fishers study, consistent with the requirements set forth in the AOC.

Ecology – Washington State Department of Ecology

EPA – US Environmental Protection Agency

It is so ORDERED and AGREED this ____ day of _____, 2013.

By: _____

Cami Grandinetti

Program Manager

Remedial Cleanup Program

Environmental Cleanup Office

U.S. EPA, Region X

Agreed this _____ day of _____, 2013.

For Respondent Port of Seattle

By

Title _____

Agreed this _____ day of _____ 2013

For Respondent City of Seattle

By

Title _____

Agreed this _____ day of _____, 2013.

For Respondent King County

By

Title _____

Agreed this _____ day of _____, 2013.

For Respondent The Boeing Company

By

Title _____

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION X
STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

IN THE MATTER OF:

Lower Duwamish Waterway

Port of Seattle, King County,
City of Seattle, The Boeing Company,

RESPONDENTS

Proceeding Under Sections 104, 122(a),
122(d)(3) of the Comprehensive
Environmental Response, Compensation,
and Liability Act (CERCLA), as amended,
42 U.S.C. §§ 9604, 9622(a), 9622(d)(3) and Under the
Washington State Model Toxics Control Act
(MTCA), ch. 70.105D RCW.

SECOND AMENDMENT

U.S. EPA, Region 10
Docket No. CERCLA-
10-2001-0055

Ecology Docket No.
00TCPNR-1895

This Second Amendment to the Administrative Order on Consent For Remedial Investigation/ Feasibility Study (AOC) for the Lower Duwamish Waterway (LDW), CERCLA Docket No. 10-2001-0055, issued on December 20, 2000, requires performance of the Enhanced Natural Recovery (ENR)/Activated Carbon (AC) pilot study set forth below under the terms and conditions of the AOC by mutual agreement with the Parties in accordance with Section XXVI of the AOC. This statement of work (SOW) for the ENR/AC pilot study for the Lower Duwamish Waterway (LDW) provides a general overview of the work to be performed, a list of study steps/tasks, and a schedule for deliverables.

The goals of the ENR/AC pilot study are to:

- Verify that ENR amended with AC can be successfully applied in the LDW by monitoring physical placement success (uniformity of coverage and percent of carbon in a placed layer);
- Evaluate performance of ENR/AC compared to ENR alone in locations with a range of polychlorinated biphenyl (PCB) concentrations;
- Assess potential impacts to the benthic community in ENR/AC compared to ENR alone; and
- Assess changes in bioavailability in ENR/AC compared to ENR alone.

In addition, LDWG may propose to evaluate whether ENR/AC will remain stable in scour areas (Category 1 areas).

SECOND AMENDMENT TO LDW RI/FS ORDER - 1



The study is intended to help inform the remedial design for the LDW related to the implementation and effectiveness of remedial technologies. Study results will be used to re-assess and appropriately refine the technology assignment assumptions for ENR, ENR/AC, and (if approved by EPA and Ecology) ENR/AC/scour mitigation applications.

The tasks are briefly described below.

Task 1: Identify Plot Locations (QAPP and Field Collection). First, LDWG will prepare a memorandum which includes tables and figures identifying candidate plot locations for the Pilot Study including a review of existing data and a rationale for selecting plot areas for sampling and send to EPA and Ecology for initial review. Based on initial discussions with EPA and Ecology, LDWG will prepare a Quality Assurance Project Plan (QAPP) for collection of surface sediment samples to be used for confirmation of plot locations. The QAPP will include a Health and Safety Plan for preliminary sampling. After approval of the QAPP, LDWG will collect bulk surface sediment data (e.g., PCB Aroclors, total organic carbon) from proposed plot areas to confirm target sediment concentrations. Validated data from this effort will be provided to EPA/Ecology. Study plot locations and sizes will be finalized in a working meeting with EPA/Ecology.

Task 2: Prepare the Design Package. LDWG will prepare a design package that evaluates sediment data collected under Task 1 and finalizes the design plans for each plot area. The design package will present the selected plot locations, and include existing conditions for each plot, the rationale for the proposed locations, and the proposed size of the test plots. Test plots will be approximately 1/2 acre in size per treatment subplot. The design package will include:

- Contract drawings and technical specifications
- Narrative design report
- QAPP for baseline and post-construction monitoring
- Water quality monitoring plan for construction
- Construction quality assurance plan
- Health and Safety Plan

The design package will also include any evaluations needed for substantive compliance with the Clean Water Act (e.g., Section 404(b)) and the Endangered Species Act.

Technical details regarding the pilot study scope include:

- Evaluate the use of ENR material (e.g., sand) and ENR sand amended with AC. The study will focus on total PCBs as the indicator chemical. Surface sediment and porewater will be analyzed for PCB congeners to assess bioavailability. Information on other contaminants (e.g., polycyclic aromatic hydrocarbons (PAHs)) may be collected for informational purposes, as determined from contaminant concentrations within selected plot locations.
- Use one target carbon dose for all study plots. The proposed carbon dose will be presented in the design package.

- Use one delivery mechanism for all study plots. Material will be placed mechanically. The proposed delivery mechanism will be presented in the design package
- Test two or three paired study plots:
 - ENR and ENR/AC in subtidal area
 - ENR and ENR/AC in intertidal area
 - LDWG may also propose a third paired study plot which includes ENR/AC/scour mitigation and ENR/scour mitigation in areas of limited scour potential.
- The study plots will be selected to include a range of PCB concentrations from the RAL (SQS) up to the CSL.

Task 3: Develop Construction Work Plan. LDWG will develop a Work Plan for construction of the pilot study. This plan will provide the detailed means and methods for conducting the work.

Task 4: Implement Field Pilot Study and Post-Construction Monitoring. LDWG will implement the ENR/AC pilot per the Construction Work Plan. LDWG will collect baseline data prior to placement of the plots and will collect post-construction data. Baseline and post-construction data collection will include, but not be limited to:

- Porewater data (PCBs and potentially other contaminants as determined in the design package);
- Bulk sediment data (additional PCB data if needed), conventional parameters (e.g., total organic carbon), black carbon, and potentially other contaminants as determined in the design package;
- SPI camera surveys for benthic community successional stages and stability (deposition and mixing patterns);
- Benthic infauna surveys (Year 3); and
- Physical conditions of the placed layer (post-construction).

Baseline data will be collected before construction to establish the baseline bioavailability metric. Construction will be conducted during the in-water work window as approved by EPA in consultation with NOAA, USFWS and Tribes, in accordance with the Construction Work Plan. Placement of material will be verified immediately after completion of construction.

Post-construction monitoring will be conducted annually for up to 3 years post-placement (Year 1, Year 2, Year 3). Benthic infauna surveys will be conducted to evaluate community function at the end of the 3-year period. (Another monitoring event may be conducted 5 years post-construction under a separate scope as part of the remedial design effort, to be determined based on results of year 3 monitoring.)

Task 5: Prepare Data Report(s). Validated sampling data will be provided to EPA and Ecology within 75 days after completion of any sampling event (and 90 days after the Year 3 event). Data will be analyzed and reports will be prepared following the Year 1 sampling and at the end of the 3-year monitoring period. The Year 1 report will include the construction completion details, baseline data, and the Year 1 monitoring results.

The Year 3 report will include the Year 2 and Year 3 monitoring results. LDWG will submit draft reports for review by EPA/Ecology. The reports will be revised and finalized and approved per the AOC process.

Table 1 provides a schedule for completing the key deliverables/milestones associated with the LDW Pilot Study. All project deliverables will be submitted by LDWG and revised to address all EPA and Ecology comments in accordance with the schedule in Table 1.

Table 1. Schedule for Task Deliverables/Milestones

Task	Deliverable	Schedule
Task 1: Study Plot Identification (QAPP and Sampling)	Draft Memorandum of candidate plot locations	7 days after issuance of AOC amendment
	Draft QAPP for plot sampling	45 days after submittal of draft memorandum of candidate plot locations to EPA/Ecology
	Final QAPP for plot sampling	20 days after receipt of EPA/Ecology comments
	Validated data to EPA/Ecology	65 days after approval of QAPP
	Finalize Plot Locations	Working meeting with EPA/Ecology to select plots 7 days after submittal of validated data
Task 2: Design Package	Notify EPA and Ecology of design contractor	145 days after issuance of AOC amendment
	Draft Design Report	130 days after selection/approval of plots
	Final Design Report	45 days after receipt of EPA comments
Task 3: Construction Work Plan	Notify EPA and Ecology of Construction Contractor(s)	Within 145 days after approval of the Final Design Report
	Draft Construction Work Plan	60 days after award of construction contractor
	Final Construction Work Plan	25 days from receipt of EPA/Ecology comments
Task 4: Implement Field Pilot Study and Post-Construction Monitoring	Notification for Pilot Study Construction Start	Provide notification to EPA/Ecology 30 days prior to initiation of field construction
	Completion of Construction	Per approved construction schedule
	Completion of Monitoring	3 years after completion of construction
Task 5: Reporting	Sampling data	75 days after completion of any sampling event (90 days after Year 3 event)

	Year 1 Draft Data Report	90 days after completion of Year 1 monitoring event, including data validation
	Year 1 Final Data Report	30 days from the receipt of EPA/Ecology comments
	Year 3 Draft Data Report	90 days after completion of Year 3 monitoring event, including data validation
	Year 3 Final Data Report	30 days from the receipt of EPA/Ecology comments

Note: Progress reports will be submitted monthly for the duration of the pilot study, consistent with the requirements set forth in the AOC.

Ecology – Washington State Department of Ecology

EPA – U.S. Environmental Protection Agency

QAPP –quality assurance project plan

All schedule dates are expressed in calendar days

It is so ORDERED and AGREED this 17 day of July, 2014.

By: Cami Grandinetti
Cami Grandinetti
Remedial Program Manager
Environmental Cleanup Office
U.S. EPA, Region X

By: _____
James J. Pendowski
Program Manager
Toxics Cleanup Program
State of Washington Department of Ecology

	Year 1 Draft Data Report	90 days after completion of Year 1 monitoring event, including data validation
	Year 1 Final Data Report	30 days from the receipt of EPA/Ecology comments
	Year 3 Draft Data Report	90 days after completion of Year 3 monitoring event, including data validation
	Year 3 Final Data Report	30 days from the receipt of EPA/Ecology comments

Note: Progress reports will be submitted monthly for the duration of the pilot study, consistent with the requirements set forth in the AOC.

Ecology – Washington State Department of Ecology

EPA – U.S. Environmental Protection Agency

QAPP –quality assurance project plan

All schedule dates are expressed in calendar days

It is so ORDERED and AGREED this ____ day of _____, 2014.

By: _____
Cami Grandinetti
Remedial Program Manager
Environmental Cleanup Office
U.S. EPA, Region X

By:  7/15/14
James J. Pendowski
Program Manager
Toxics Cleanup Program
State of Washington Department of Ecology

Agreed this 23rd day of June, 2014.

For Respondent City of Seattle

By Carl A. Wang
Title Mayor

Agreed this 1ST day of JULY, 2014.

For Respondent The Boeing Company

By 

Title URSULA ENGLISH
VICE PRESIDENT
ENVIRONMENT HEALTH
AND SAFETY

Agreed this 3rd day of July, 2014.
For Respondent Port of Seattle

By Scott Beckett for Tony Gattitani
Title Deputy CEO

Agreed this 11 day of JULY, 2014.

For Respondent King County

By Dan Court

Title EXECUTIVE

The EPA issued a record of decision for the Lower Duwamish Waterway Superfund Site on November 21, 2014 (the “Lower Duwamish Waterway ROD”). The Lower Duwamish Waterway ROD selected remedial actions for the in-waterway portion of the Lower Duwamish Waterway Superfund Site. In addition, the Lower Duwamish Waterway ROD identifies pre-remedial design activities, including baseline sampling of a variety of environmental media and a survey of waterway users that may be conducted before remedial design.

Third Amendment

EPA, Ecology, and Respondents agree to amend the RI/FS AOC as follows:

1. The work performed pursuant to this Third Amendment shall comply with CERCLA and its implementing regulations, the National Contingency Plan, 40 C.F.R. Part 300 and shall be subject to the review and approval of the EPA. With the exceptions of the authority to review (except as a support agency) and approve work, resolve disputes (excluding Ecology's ability to resolve disputes related to its cost recovery), or enforce work performed under this Third Amendment, Ecology shall retain all rights and obligations it has under the RI/FS AOC, including those rights of access and cost recovery conferred to it by Sections XIV and XXII of the RI/FS AOC.
2. The objectives of this Third Amendment are identified in **Paragraphs numbered 1 through 5 of** Section 1 of the attached Statement of Work for Third Amendment to the AOC.
3. For the purposes of this Amendment, Paragraph 3 of Section X (Modification of the Work Plan) of the AOC shall be deleted and replaced by the following:

EPA may identify gaps in the work required under the Third Amendment that prevent the accomplishment of the objectives of the Third Amendment **as defined above**. In that event, EPA may request in writing that LDWG perform additional work under this Third Amendment, as necessary for the accomplishment of these objectives. Respondents shall confirm their willingness to perform such additional work, in writing, to EPA within twenty-one (21) days of receipt of the EPA request, or Respondents shall invoke dispute resolution. Subject to EPA resolution of any dispute, Respondents shall implement the additional work requested by EPA. The additional work shall be completed according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to a plan or written work plan supplement. EPA reserves the right to conduct the work at any point, to seek reimbursement from Respondents, and/or seek any other appropriate relief. If EPA determines that conditions at the Site are creating or have the potential to create a danger to human health or welfare on-site or in the surrounding area or to the environment, EPA may order Respondent to stop further implementation of this Order for such period of time in the judgement of EPA is needed to abate the danger.

4. The amounts paid by Respondents to the EPA Hazardous Superfund pursuant to the requirements of Section XXII (Payment of EPA Oversight Costs) of the AOC shall be deposited by EPA into the Lower Duwamish Waterway Superfund Site Special Account pursuant to Section XXI (Reservations of Rights and Reimbursement of Costs) of the AOC to be retained and used to conduct or finance response actions at or in connection with the Lower Duwamish Waterway Superfund Site. In addition, EPA has several other site-specific accounts related to the Lower Duwamish Waterway Superfund Site

within the EPA Hazardous Superfund. Funds held in such site specific accounts may be transferred to the Lower Duwamish Waterway Superfund Site Special Account if EPA determines that the funds are no longer needed to finance or otherwise support the implementation of response actions related to response action for which such site specific account was created. After completion of response actions at or in connection with the Lower Duwamish Waterway Superfund Site, any funds remaining in the Lower Duwamish Waterway Site Specific Account may be transferred by EPA to the EPA Hazardous Substance Superfund.

5. The list of deliverables identified in Paragraph 4 of Section XIX (Delay in Performance, EPA Stipulated Penalties, Enforcement) of the AOC is amended to delete deliverables (3) through (6) ;and to include the original and any revised Quality Assurance Project Plan, Data Evaluation Report, Report for Waterway Survey and Assessment of In-Water Structures, Recovery Category Recommendations Report, and Design Strategy Recommendations Report identified in the attached SOW.
6. The list of deliverables identified in Paragraph 5 of Section XIX (Delay in Performance, EPA Stipulated Penalties, Enforcement) is amended to delete deliverables (1) through (9) and include any final data report and any final technical memorandum identified in the attached SOW.
7. Respondents shall, subject to and conditioned upon the prior approval of EPA, implement the activities required by the attached SOW, which is incorporated into and enforceable under the terms of the AOC as amended by this Third Amendment.

It is so ORDERED AND AGREED this _____ day of _____, 2_____.

BY: _____
 Shawn Blocker
 Unit Manager Office of Environmental Cleanup
 Region 10
 United States Environmental Protection Agency

DATE: _____

By:  _____
 James J. Pendowski
 Program Manager
 Toxics Cleanup Program
 Washington Department of Ecology

DATE: 3/24/16

BY: Cami Grandinetti
Cami Grandinetti
Manager, Remedial Cleanup Program
Office of Environmental Cleanup
U. S. Environmental Protection Agency, Region X

DATE: 4/27/16

EFFECTIVE DATE: 4/27/16

Agreed this 14 day of April, 2018
For Respondent Port of Seattle

By: *Ted Fick*
Name Ted Fick
Title CEO Port of Seattle

Agreed this 11 day of April, 2018
For Respondent City of Seattle

By: 

Name: Edward B. Murray

Title: Mayor

Agreed this 30 day of MARCH, 2016
For Respondent King County

By: Dow Constantine

Dow Constantine
King County Executive

Agreed this 1 day of April, 2015 ~~2016~~
For Respondent The Boeing Company SCS

By: SC S Shestak
Name STEVEN C SHESTAK
Title Director of Environment
The Boeing Co.

Appendix A: Statement of Work for Third Amendment of the LDW AOC

Pre-Design Studies

This Statement of Work (SOW) for the Third Amendment of the Lower Duwamish Waterway Superfund Site (LDW) administrative order on consent (AOC) provides an overview of remedial design phase pre-design work to be performed (Pre-Design Studies), a list of tasks, and a schedule of deliverables. The requirements of the Selected Remedy are summarized in the Record of Decision (ROD) issued in November 2014, including Section 13.

I. Objectives of Pre-Design Studies

The overall objective of the Pre-Design Studies is to advance the implementation of the Selected Remedy for the LDW. More specifically, the Lower Duwamish Waterway Group, referred to herein as LDWG or Respondents, shall perform work, as described in Section II below, to:

1. consistent with Section 13.2.3 of the ROD, to establish post-Early Action Area (EAA) cleanup baseline conditions in environmental media (sediments, surface water, porewater, tissue), to evaluate the effectiveness of EAA cleanups and the degree to which natural recovery has occurred since the Remedial Investigation/Feasibility Study (RI/FS), to serve as a baseline for comparison to post-remedial action data, and to aid in the evaluation of source-control,
2. perform a survey of waterway users and an assessment of in-water structures to inform recovery category recommendations and technology assignments,
3. support development of appropriate and effective institutional controls for consumption of LDW resident seafood,
4. identify other site-wide and area-specific remedial design and remedial action information needs, and
5. develop a strategy for remedial design phasing.

To help EPA ensure that all remedial design data needs are addressed in the appropriate sequence and without delay, LDWG shall describe the environmental data types and other information needed in order to complete remedial design, including baseline data, site-wide data, area-specific data, and remedial design data needs specifically identified in the ROD. LDWG is not required to fill area-specific pre-design data needs under this AOC amendment except as described below.

This SOW does not require LDWG to duplicate characterization required pursuant to a Model Toxics Control Act (MTCA) order. The design strategy developed in Task 10 will further specify and facilitate the implementation of remaining pre-design investigations and remedial design work.

II. Work to be Performed

LDWG shall implement the tasks below for planning, implementation, and reporting of the various Pre-Design Studies.

Task 1: Work Plan. LDWG shall submit a work plan and a schedule for phasing, sequencing, and implementing the tasks required to meet the objectives of this AOC amendment. The Work Plan shall include the RI/FS conceptual site model, updated as appropriate, and data quality objectives (DQOs) for analytical data collection. The Work Plan must include a data management plan for laboratory, Geographic Information System (GIS) locational point data, and spatial data deliverables that is consistent with the EPA Region 10 (January 2014 draft or later) Data Management Plan.

In advance of the initial Work Plan submittal LDWG shall provide a draft annotated outline along with tables and figures showing proposed phasing, sampling types, stratification approach, conceptual sample locations and numbers, and analytical methods, with a supporting memorandum detailing the rationale for the approach, to facilitate input from EPA and stakeholders.

Baseline Sampling: The baseline sampling shall establish a statistically-based LDW-wide baseline dataset of environmental media that is spatially consistent with anticipated future long term monitoring data collection efforts and that will provide a basis for comparison with future LDW-wide data collection to assess progress toward achieving Applicable, Relevant, and Appropriate Requirements (ARARs) and the cleanup levels for Remedial Action Objectives (RAOs) 1, 2, and 4, at the spatial scales indicated in the ROD, Table 19. While more intensive post-remedial action baseline characterization relative to RAO 3 will be developed during remedial design, surface sediment baseline samples obtained under this AOC amendment shall be analyzed for comparison to RAO 3 cleanup levels in Table 20 of the ROD and shall include locations representative of a range of conditions in the MNR areas (>SCO and <SCO) identified in Figure 18 of the ROD.

Baseline porewater samples from the biologically active zone will be collected in ENR and MNR areas identified in Figure 18 of the ROD, collocated with a subset of sediment samples. The porewater samples will be analyzed for cPAHs, PCBs, arsenic, and dioxins/furans, with relevant analyses (OC, AVS/SEM) and additional metals data reporting as determined necessary by EPA. EPA may approve use of passive sampling for organics and may approve reduced PCB and arsenic analysis if, based on existing porewater data for PCBs and arsenic (e.g. ongoing RARE, Activated Carbon Pilot, and MIT studies), additional PCBs and arsenic data are not necessary.

This AOC amendment does not include the comprehensive area-specific baseline characterization necessary in the future to assess remedy performance in remediated areas and to document progress towards natural recovery in Monitored Natural Recovery (MNR) and Enhanced Natural Recovery (ENR) areas. Data quality objectives for this future monitoring will be determined in remedial design.

Other Characterization: The Work Plan shall include targeted sampling for the following purposes, to the extent they are not addressed by baseline sampling:

- to help the Washington Department of Ecology assess the sufficiency of contaminant source control,
- to observe site-wide trends and changes in surface sediment quality and surface water quality over time,

- to support comparisons of actual to predicted natural recovery,
- to improve the understanding of the relationship between clam, porewater, and sediment.

To advance these objectives, subject to the limitations in Section I, the sampling design will include reoccupation of some sediment sampling locations sampled in the RI/FS, particularly MNR areas; sampling of surface water to assess variability on a sitewide scale, sufficient for use in future trend analyses; seep sampling in LDW near where existing data are insufficient to demonstrate that groundwater is not a significant ongoing source of contamination or contaminant remobilization above the RALs; and sediment sampling near outfalls and in intertidal eroding bank areas between plus 4-feet Mean Lower Low Water (MLLW) and Mean Higher High Water (MHHW).

Identification of other data needs: The Work Plan shall identify additional time-critical data needs for area-specific pre-design purposes and shall generally describe the data types, use and general sequence of engineering and planning information needed for the detailed engineering design phase. The Work Plan shall indicate the process and lead time for obtaining this information, so that EPA can ensure that the tasks will proceed in a timely fashion.

The description of data needs for area-specific pre-design purposes may be at a lower level of detail than Data Quality Objectives (DQOs) for characterization required under this AOC amendment, but shall be comprehensive and shall include estimated timelines for obtaining information or environmental data. In addition to information needed to define areas and volumes for application of remedial technologies, the data needs shall consider the EAAs and other ongoing or completed sediment cleanup projects, the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995), ongoing work (such as the Fisher Study, Pollutant Loading Assessment, RARE study, and activated carbon pilot study) and other anticipated remedial design decisions, information needs and criteria. This includes information that may be needed for determining operations areas, material and equipment storage areas, access roads, truck routes and vessel management planning, waterway access and staging areas, cap thicknesses (in accordance with EPA and USACE (1998), cover, habitat, and backfill material types and acceptance criteria (for habitat material, see Section 13.2.1.1), compliance with ARARs, criteria for selection of activated carbon or other carbon sequestering material (in ENR areas, if proposed, and as a component of caps), candidate material sources, sediment dredging and dewatering methods, dredged material disposal methods, environmental protection and monitoring.

Task 2. Existing data compilation technical memorandum. LDWG shall compile available data for sediments (including incoming suspended sediments from the Green/Duwamish River and storm drain and CSO solids), shoreline bank soils, surface water, porewater, groundwater, and fish tissue, including relevant data obtained or made available after April 2010 and/or associated with EAA monitoring. LDWG shall obtain data from EIM, LDWG parties, EPA/Ecology, and others as practicable.

LDWG shall review sampling data collected within the LDW Superfund site. Those which meet current Superfund data quality requirements shall be compiled and presented in tables and maps. Sources of data within the site that does not meet these requirements shall be referenced in the compilation, as was done for the RI/FS. LDWG shall compile and present data collected

upstream of the site also, providing an overview for each data set of the data quality assurance approach. The upstream data may be used in the future for Superfund decisions. LDWG shall update the groundwater data set for upland areas following the general approach used in the Phase I RI, compiling data for the COCs in the ROD (Tables 19 and 20) and for VOCs. At this time LDWG is not required to perform data quality reviews of groundwater, upstream, storm drain, and CSO solids data under this AOC amendment.

LDWG shall submit for EPA review and approval a draft technical memorandum summarizing the sources and types of data, sampling years, number of samples, and data quality reviews where conducted. Sample locations shall be presented in tabular form and plotted on GIS figures. The figures shall include outfall locations, in-water and over-water structures, and property lines. Compiled data shall be included in an appendix. The GIS figures shall include layers with RI/FS data.

The technical memorandum shall include an assessment of the ongoing RARE, Activated Carbon Pilot, and MIT study plans and, as available, results to determine if additional information is needed regarding the relationship between contaminants in tissue, sediment and porewater.

Task 3: Quality Assurance Project Plan (QAPP). LDWG shall prepare a Quality Assurance Project Plan (QAPP) for EPA review and approval. The QAPP shall address collection of data necessary based on a review of existing data to achieve the DQOs of the approved work plan.

The QAPP shall comply with current EPA guidance. For phased field efforts, QAPP addenda or multiple QAPPs may be necessary. The QAPP shall address surface sediment, intertidal subsurface sediment, surface water, fish and shellfish tissue, and porewater baseline samples, as required in the ROD. The QAPP will consider temporal variations in surface water and will provide for multiple rounds of surface water sampling. The QAPP will identify the appropriate times for sampling the different tissue types.

The QAPP shall include the DQOs refined and adjusted if necessary based on the compilation of existing data. It shall include all appropriate supporting documentation, such as a Field Sampling Plan and Health and Safety Plan. The QAPP shall include a statistically based rationale for the number of samples of each sampled medium, compositing schemes, and locations. Data gathering detailed in the QAPP shall meet the DQOs approved by EPA. The sampling approach below outlines a minimum sampling approach that will be revised as necessary based on the DQOs:

- ◆ Subtidal and intertidal sediment will be collected sitewide from the 0 to 10 cm interval and other depth intervals as required to meet the DQOs. The samples shall be analyzed for all COCs listed in the ROD, Tables 19 and 20, and associated conventional parameters (e.g., total organic carbon, grain size, percent solids). Polychlorinated biphenyl (PCB) congeners will be analyzed on a subset of samples. The congener data must be sufficient to assess the relationship between the PCB congener and Aroclor analytical results and must achieve detection limits to support establishment of baseline conditions

relative to the RAO 1 cleanup level. A subset of samples will be analyzed for the contaminants in ROD Tables 14 and 18.

- ◆ Intertidal areas will also be sampled over the 0 to 45cm depth and analyzed for the COCs listed in Table 19 of the ROD. A subset of samples will be analyzed for the contaminants in the ROD, Table 14.
- ◆ Surface water sampling will be distributed across the LDW, including samples upstream and in each of the three LDW reaches [River Mile 0.0-2.2, 2.2-4.0, and 4.0-5.0]) to assess ambient conditions over time relative to surface water quality ARARs. Samples will include whole water grabs collected at appropriate depths at each location. The surface water sample design will be based on assessing CERCLA compliance with ARARs under various waterway conditions. Several rounds of sampling are anticipated as part of the baseline sampling as necessary to address variability. Samples will initially be analyzed for all analytes in Washington Water Quality Standards (WQS) (WAC173-201A), national recommended AWQC (CWA Section 304[a]), and NTR (40 CFR 131.36(b)(1) as applied to Washington, 40 CFR 131(d)(14)), and other parameters as necessary to meet the DQOs. The QAPP may propose a statistical basis for reducing the surface water analytes to the contaminants that exceeded Ambient Water Quality Criteria (AWQC), the National Toxics Rule (NTR), or Washington WQS values after initial sampling rounds, as noted in ROD Section 13.2.3.
- ◆ Tissue samples will be collected from various species of fish and shellfish and various tissue types (e.g. whole-body, fillet) selected based on a review of species sampled during the RI and of the Fisher Study results. Tissue results will be used to track progress of cleanup actions for RAO 1 (human health seafood consumption) and RAO 4 (ecological seafood consumption by river otter). Samples will be analyzed for PCBs as Aroclors, arsenic, Dioxin/Furans, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), lipids, and solids. A subset will also be analyzed for the contaminants in Tables 14 and 18 of the ROD, and for PCB congeners.
- ◆ Porewater and seeps will be sampled and analyzed as required by the data quality objectives. The QAPP will identify appropriate analyses of seep or porewater samples for contaminants.

Task 4: Sampling and Analysis. After approval of the QAPP (or QAPPs for each sampling event), LDWG shall collect and analyze samples per the approved QAPP schedule(s).

Task 5: Sampling Data Report. For each sampling event, LDWG shall submit a data report for review and approval by EPA. Each data report must include a description of the field effort, any deviations from the approved QAPP, and validated data in tabulated format, data validation reports, laboratory data reports, and photographs documenting the work conducted. LDWG shall submit the data in electronic data deliverables format to EPA and shall upload the data to both the Environmental Information Management (EIM) system and water quality exchange (WQX).

Task 6: Data Evaluation Report. LDWG shall submit a data evaluation report for EPA review and approval. The report must present a narrative interpretation of data and results, results of statistical analyses, the data and statistics in tabular and graphic format, including maps and clear

graphics. The report must present baseline characterization results and other analytical data, statistical evaluations, and supporting calculations. The report shall compare baseline data to the cleanup levels in the ROD, Tables 19 and 20, and target tissue concentrations in the ROD, Table 21.

To assess the effects of the EAA cleanups on risk-driver surface weighted average concentration (SWAC) reduction, LDWG shall compare the results of the baseline sediment sampling with the RI/FS pre-EAA SWACs and BCM post-EAA model predictions. LDWG shall also compare the bedload composition model (BCM) input parameters (bed replacement, upstream, and lateral chemistry values) against available measured results for these inputs, and make recommendations for revised input parameters that may be used in future modeling for refined natural recovery predictions.

The report must specify whether the data met the DQOs, identify data gaps and issues, and present recommendations to resolve them with additional field characterization or other work.

LDWG shall prepare a GIS map with layers for RI/FS data, data collected by LDWG for baseline and other purposes under this SOW, and sediment data compiled under Task 2. If requested by EPA, LDWG shall prepare or support EPA preparation to make the GIS map web-accessible.

Task 7: Work Plan for Waterway User Survey and Assessment of In-Water Structures.

LDWG shall submit a work plan for the survey of waterway users and assessment of in-water structures, for EPA review and approval. The work plan shall describe the approach and rationale, a list of contacts to be surveyed, questions to be asked, participants and documentation methods, and a schedule. It shall include details of planned assessment and mapping of in-water structures.

The primary objective of the Waterway User Survey, described in Section 13.2.3 of the ROD, is to better understand the current and reasonably anticipated vessel operations, including those of tribal fishing, maneuvering and anchoring of ships, barges and tugs; use of spuds; and other activities such as berth and wharf maintenance. Information about activities that may disturb the sediment bed will inform EPA decisions regarding Recovery Categories and will support development of location-specific use restrictions that would prohibit activities that may damage caps, such as tug maneuvering and spudding. The survey shall also provide information to inform plans for vessel management during construction and to support EPA decisions about development of location-specific use restrictions and technology assignments that would allow for fewer restrictions on the use of certain areas, as described in Section 13.2.4 of the ROD.

The assessment of in-water structures will help interpret the user survey and identify areas where structural or access restrictions (e.g. under-pier areas and the vicinity of dolphins/pilings, bulkheads, and riprapped or engineered shorelines) may require adjustments to sampling, cleanup technology application, or remedial design, as described in Section 13.2.1.3 of the ROD.

Task 8: Report for Waterway User Survey and Assessment of In-Water Structures. Upon approval of the Waterway User Survey and Structures Assessment Work Plan, LDWG shall conduct the survey. Once the survey has been completed, LDWG shall update the GIS layer for structures and shall submit a report that summarizes activities and results. The report must include an updated map and updated GIS layer of in-waterway structures.

Task 9: Recovery Category Recommendations Report. Based on the waterway user survey and in-water structure assessment, LDWG shall submit a report providing any recommended modifications to assignment of Recovery Categories in the ROD, for EPA review and approval. The report shall include figures identifying current and reasonably anticipated uses and shall compare these to the physical criteria in ROD Table 23. The report shall include narrative, graphics, and GIS files with proposed adjustments to assignments of Recovery Category. Other information, such as refined sedimentation rates and contaminant trends based on new data, shall be included, if available, and further proposed adjustments to Recovery Categories provided for EPA to consider, as provided under Empirical Contaminant Trend Criteria in ROD Table 23.

The report shall also identify areas where adjustments may be necessary to the application of cleanup technologies, either to accommodate operational needs or to inform institutional controls on the use of such areas.

Task 10: Design Strategy Recommendations Report. LDWG shall submit for EPA review and approval a conceptual approach for completing the engineering design of the LDW Selected Remedy, based on the data needs identified in Task 1, the compilation of existing data, the other information and analyses generated in this SOW, and source control information available from Ecology. Conceptual strategies for acquiring the necessary pre-design information will be discussed, including types of data needing to be collected, phasing of investigations, remedial design sampling strategies, confirmation of technology assignments and boundaries, and acquisition of engineering data and planning information needed to complete the detailed designs.

Task 11: Support for Development of Seafood Consumption Institutional Controls.

The ROD calls for minimizing reliance on seafood consumption advisories to the extent practicable, and the Selected Remedy includes waterway-wide institutional controls to reduce human exposure to contaminants. Section 13.2.8 of the ROD calls for convening an advisory group as a means for the affected community and local agencies to work together on mitigating the impacts of the cleanup on the affected community. Section 13.2.4 states: 'EPA anticipates relying on the existing Washington Department of Health (WDOH) fish and shellfish consumption advisories. Information obtained through the ongoing study of fishing and fish and shellfish consumption patterns, will be used to develop appropriate and effective institutional controls (ICs) for fishers and consumers of LDW resident seafood (such as outreach and education programs).' EPA believes that to be effective and appropriate the ICs must be tailored to the affected community and built with community input.

LDWG shall, as directed by EPA, support development and implementation of institutional controls for LDW seafood consumption by providing, funding, or participating in the following until completion of Tasks 1-10 of this amendment: (1) a planning group responsible for development and implementation of a plan for institutional controls; (2) incentives for participation on the planning group by community members who have relevant knowledge or experience, subject to public agencies' legal authority to provide such incentives; (3) technical materials to support the institutional controls; (4) pilot testing of potential institutional control tools, such as outreach campaigns developed using community based social marketing principles; (5) assessment of the pilot test and revisions to the plan, and (6) assessment of the plan's success and recommendations for future ICs on the LDW.

III. Community Involvement

EPA is updating its Community Involvement Plan (CIP). As requested by EPA, LDWG shall continue to support EPA's community involvement activities. This will include providing online access to initial submissions and updates of deliverables to (1) Community Advisory Groups, (2) Technical Assistance Grant recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. All community involvement activities conducted by LDWG at EPA's request are subject to EPA's oversight.

IV. Technical Specifications

LDWG shall submit electronic data in accordance with the Region 10 Data Management Plan (May 2014) and associated guidance and templates. Sampling and monitoring data must be submitted in standard regional Electronic Data Deliverable (EDD) format. LDWG shall upload the data into EPA's WQX database and into Ecology's EIM database. LDWG shall provide EPA with a copy of the files created to load data into the WQX database.

Spatial data, including spatially-referenced data and geospatial data, must be submitted following the procedures in the "U.S. EPA Region 10 Geographic Information Systems (GIS) Data Deliverable Guidance for External Entities"; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). The GIS data must be submitted to EPA on discs at the same time as the final reports are submitted. If requested by EPA, LDWG shall provide GIS data used in sampling plans, Quality Assurance Project Plans, monitoring reports, studies, pre-remedial design sampling reports, or other submittals where GIS and mapping programs were used to generate maps, diagrams, and other visual aids. Discs containing this information shall be sent to the EPA Project Manager. Contact EPA with questions or to request assistance for GIS submission requirements.

Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at <https://edg.epa.gov/EME/>.

Each file must include an attribute name for each site unit or sub-unit submitted. Consult <http://www.epa.gov/geospatial/policies.html> for any further available guidance on attribute identification and naming. Spatial data submitted by LDWG does not, and is not intended to, define the boundaries of the Site.

V. Schedule of Deliverables

In accordance with the schedule in Table 1 below and the AOC process, LDWG shall submit all project deliverables below to EPA for review and approval. Following initial draft, EPA comments shall be fully addressed in a revision due 30 working days from LDWG receipt of EPA comments, unless otherwise approved or directed by EPA.

Table 1. Schedule for Task Deliverables/Milestones

Task	Deliverable	Schedule in Calendar Days
Task 1: Work Plan	Outline	210 days from effective date of this AOC amendment (assumes 180 days for LDWG consultant contracting process. LDWG shall seek to complete the contracting as soon as possible. Contracting delays may be a basis for an extension request).
	Draft Work Plan	60 days from EPA comments on the Outline
Task 2: Existing data compilation and data gaps technical memorandum	Draft Technical Memorandum	255 days from effective date of this AOC amendment. A later submittal date for compiled groundwater may be proposed in the Task 1 work plan.
Task 3: QAPP and associated support documents	Draft QAPP and associated support documents	45 days after EPA approval of Task 1 Work Plan. A schedule for a QAPP addendum for seep sampling may be proposed in the Task 1 work plan.
Task 4: Sampling and Analysis	Conduct sampling	Initiate and complete sampling per approved QAPP schedule.
Task 5: Data Report.(for each sampling round)	Draft Data Report (and electronic data deliverable / upload to EIM and WQX)	21 days after receipt of validated data (for each round)
Task 6: Data Evaluation Report.	Draft Data Evaluation Report	60 days after submittal of Draft Data Report
Task 7: Work Plan - Waterway User Survey and Assessment of In-Water Structures.	Draft Work Plan	225 days after effective date of this AOC amendment
Task 8: Report - Waterway User Survey Report and Assessment of In-Water Structures.	Conduct Survey and Assessment	Initiate within 30 days of EPA approval of Task 7 Work Plan
	Draft Report	45 days from completion of Task 8 Survey
Task 9: Recovery Category Recommendations	Draft Recovery Category Recommendations	45 days after approval of Task 8 Draft Survey and Assessment Report
Task 10: Design Strategy Recommendations Report	Draft Design Strategy Recommendations Report	60 days after submittal of Task 8 Draft Survey and Assessment Report

The EPA issued a record of decision for the Site on November 21, 2014 (the “Lower Duwamish Waterway ROD”). The Lower Duwamish Waterway ROD selected remedial actions for the in-waterway portion of the Site.

Source control is an integral part of the strategy for addressing contamination throughout the Site. An objective of the source control is to find and sufficiently control sources before commencing in-waterway remediation. Ecology is the lead agency for implementing source control actions and uses its existing regulatory authorities to control sources. For purposes of assessing adequacy of source control in the immediate source area to the LDW, Ecology has divided the LDW into three reaches: upper, middle, and lower. Consistent with Sections 4.2 and 13.2.7 of the LDW ROD, EPA intends to commence remedial action for the LDW Site or a segment thereof after a source control determination for the LDW Site or segment thereof is made.

The objectives of this Fourth Amendment are to: 1) design the remedy for river mile 3.0 to river mile 5 of Lower Duwamish Waterway Site (the “LDW Upper Reach”), consistent with the Lower Duwamish Waterway ROD and CERCLA; 2) incorporate and supersede the work being carried out under the Third Amendment to this AOC in support of the development of seafood consumption institutional controls for the Site; and (3) provide for timely periodic monitoring of selected site conditions, as necessary. The attached Scope of Work (SOW) provides an overview of the work to be performed, a list of deliverables, and a schedule for these deliverables.

Fourth Amendment

EPA, Ecology, and Respondents agree to amend the RI/FS AOC as follows:

1. The work performed pursuant to this Fourth Amendment shall comply with CERCLA and its implementing regulations, the National Contingency Plan, 40 C.F.R. Part 300 and shall be subject to the review and approval of EPA. With the exceptions of the authority to review (except as a support agency) and approve work, resolve disputes (excluding Ecology’s ability to resolve disputes related to its cost recovery), or enforce work performed under this Fourth Amendment and any subsequent amendment to the RI/FS AOC, Ecology shall retain all rights and obligations it has under the RI/FS AOC, including those rights of access and cost recovery conferred to it by Sections XIV and XXII of the RI/FS AOC. EPA will provide Ecology with an opportunity to review and comment on any submittal requiring EPA approval before EPA approves, modifies or disapproves the submittal. However, a failure by EPA to allow such an opportunity to Ecology shall not be a basis for Respondents to dispute an EPA decision to approve, modify or disapprove a submittal.
2. EPA and Respondents may by written agreement modify the work provided for by this Fourth Amendment.
3. For the purposes of this Fourth Amendment, Paragraph 3 of Section X (Modification of the Work Plan) of the RI/FS AOC shall be deleted and replaced by the following:

EPA may identify gaps in the work required under the Fourth Amendment that prevent the accomplishment of the objectives of the Fourth Amendment as defined above. In that event, EPA may request in

writing that LDWG perform additional work under this Fourth Amendment, as necessary for the accomplishment of these objectives. Respondents shall confirm their willingness to perform such additional work, in writing, to EPA within twenty-one (21) days of receipt of the EPA request, or Respondents shall invoke dispute resolution. Subject to EPA resolution of any dispute, Respondents shall implement the additional work requested by EPA. The additional work shall be completed according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to a plan or written work plan supplement. EPA reserves the right to conduct the work at any point, to seek reimbursement from Respondents, and/or seek any other appropriate relief. If EPA determines that conditions at the Site are creating or have the potential to create a danger to human health or welfare on-site or in the surrounding area or to the environment, EPA may order Respondent to stop further implementation of this Order for such period of time in the judgement of EPA is needed to abate the danger.

4. The amounts paid by Respondents to the EPA Hazardous Superfund pursuant to the requirements of Section XXII (Payment of EPA Oversight Costs) of the RI/FS AOC shall be deposited by EPA into the Lower Duwamish Waterway Superfund Site Special Account pursuant to Section XXI (Reservations of Rights and Reimbursement of Costs) of the RI/FS AOC to be retained and used to conduct or finance response actions at or in connection with the Site. In addition, EPA has several other site-specific accounts related to the Site within the EPA Hazardous Superfund. Funds held in such site specific accounts may be transferred to the Lower Duwamish Waterway Superfund Site Special Account if EPA determines that the funds are no longer needed to finance or otherwise support the implementation of response actions related to response action for which such site specific account was created. After completion of response actions at or in connection with the Site, any funds remaining in the Lower Duwamish Waterway Site Specific Account may be transferred by EPA to the EPA Hazardous Substance Superfund.
5. Remove and replace Paragraph 1 of Section XV with the following:

All deliverables under this AOC shall be submitted in writing unless otherwise specified. All deliverables must be submitted by deadlines in the SOW attached to this Amendment or as otherwise approved by EPA. Unless otherwise requested by the EPA Project Coordinator, Respondents shall submit all deliverables to EPA in electronic form (native format and web-ready pdf) with a single hard copy of the first draft and the final version of all documents subject to EPA comment.

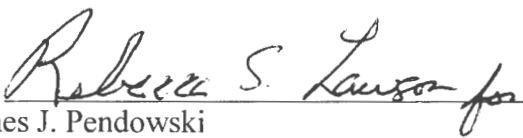
Technical specifications for sampling and monitoring data and spatial data are addressed in the SOW attached to this Amendment. If any deliverable includes maps, drawings, or other exhibits that are in color or larger than 8.5" by 11", Respondents shall also provide EPA with paper copies of such exhibits.

6. The list of deliverables identified in Paragraph 4 of Section XIX (Delay in Performance, EPA Stipulated Penalties, Enforcement) of the RI/FS AOC is amended to delete deliverables (3) through (6) and to include the original and revised Remedial Design Work Plan, and originals of the Preliminary Remedial Design, the Intermediate Remedial Design, the Pre-Final Remedial Design, and the Final Remedial Design.
7. The basis for violations identified in Paragraph 5 of Section XIX (Delay in Performance, EPA Stipulated Penalties, Enforcement) is amended to delete deliverables (1) through (9) and to include the original and final deliverables requiring EPA approval identified in the attached SOW except for a monthly progress report and those deliverables identified in Paragraph 6 above.
8. Respondents shall, subject to and conditioned upon the prior approval of EPA, implement the activities required by the attached SOW, which is incorporated into and enforceable under the terms of the RI/FS AOC as amended by this Fourth Amendment.
9. All work required by the Task 11 of the Third Amendment to the RI/FS AOC shall be incorporated into and superseded by this Fourth Amendment to the RI/FS AOC.

It is so ORDERED AND AGREED this ninth day of July, 2018.

BY: 
Shawn Blocker
Unit Manager Office of Environmental Cleanup
Region 10
United States Environmental Protection Agency

DATE: 7/9/18

By: 
James J. Pendowski
Program Manager
Toxics Cleanup Program
Washington Department of Ecology

DATE: 7/3/2018

EFFECTIVE DATE: July 9, 2018
Agreed this 15 day of June, 2018
For Respondent Port of Seattle

By: SR Mtl
Name Stephen Mednick
Title Executive Director

Effective July 9, 2018

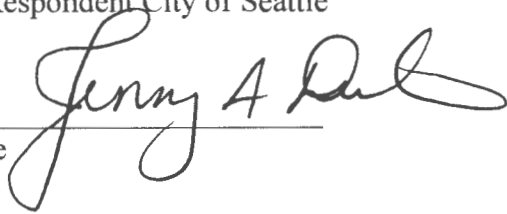
Agreed this ____ day of _____, 2018

For Respondent City of Seattle

By: _____

Name

Title

A handwritten signature in black ink, appearing to read "Jenny A. Paul", is written over a horizontal line. The signature is fluid and cursive.

Agreed this 24 day of May, 2018
For Respondent King County

By: Dow Conch
Name
Title

Agreed this 22 day of May, 2018
For Respondent The Boeing Company

By: SL Shestag
Name Steven L Shestag
Title Director, EHS Environment

Attachment to Fourth Amendment of the *Administrative Order on Consent for Remedial Investigation/Feasibility Study*, U.S. EPA, Region 10 Docket No. CERCLA 10-2001-0055, Ecology Docket No 00TCPNR-1895 (12/20/2000)

REMEDIAL DESIGN
STATEMENT OF WORK
LDW UPPER REACH
LOWER DUWAMISH WATERWAY SUPERFUND SITE
Seattle, King County, State of Washington
EPA Region 10
May 2018

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1. INTRODUCTION AND BACKGROUND

1.1 Introduction. This Statement of Work (SOW) sets forth the procedures and requirements for implementing Amendment #4 (also referred to as AOC4 or the Fourth Amendment) of the Administrative Order on Consent for Remedial Investigation (RI)/Feasibility Study (FS) of the Lower Duwamish Waterway Superfund Site (Site or LDW) (U.S. EPA Region 10 Docket No. CERCLA 10-2001-0055, Ecology Docket N. 00TCPNR-1895, RI/FS AOC). Amendment #4 work includes remedial design for the upper reach of the Site, as defined in Section 3.2 below, and other tasks enumerated in this SOW, in accordance with the Record of Decision for the Site signed November 21, 2014 (ROD).

1.2 Structure of the SOW.

- Section 2 (Continued Development and Implementation of Seafood Consumption Institutional Controls (ICs)) sets forth the process for continuing to develop, pilot and/or implement outreach for appropriate and effective institutional controls related to seafood consumption.
- Section 3 (Remedial Design) sets forth the process for developing the Remedial Design (RD), which includes the submission of specified primary deliverables.
- Section 4 (Periodic Monitoring of Selected Site Conditions) sets forth elements of site monitoring to be performed by the year 2023 to generate tissue data relevant to human health risk and to assess polychlorinated biphenyls (PCB) trends in surface water quality. Respondents shall perform this work under AOC4 unless it is performed pursuant to another administrative order or Consent Decree.
- Section 5 (Deliverables) describes the content of supporting deliverables and the general requirements regarding Respondents' submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 6 (Schedule) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the RD.
- Section 7 (References) provides a list of references, including URLs.

1.3 The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the RI/FS AOC, have the meanings assigned to them in CERCLA, in such regulations, or in the RI/FS AOC, except that the term "Paragraph" or "¶" means a paragraph of the SOW, and the term "Section" means a section of the SOW, unless otherwise stated.

2. CONTINUED DEVELOPMENT AND IMPLEMENTATION OF SEAFOOD CONSUMPTION ICs

- 2.1** This section incorporates and supersedes RI/FS AOC amendment #3 Task 11 (Support for Development of Seafood Consumption Institutional Controls). Respondents are responsible for costs incurred by EPA related to work performed under this section through the date of EPA approval of the upper reach Final (100 percent) Remedial Design, unless otherwise agreed to by EPA and Respondents. Respondents shall provide, fund, or participate in the following: (1) a planning group responsible for development and implementation of a plan for institutional controls; (2) incentives for participation on the planning group by community members who have relevant knowledge or experience, subject to public agencies' legal authority to provide such incentives; (3) technical materials to support the institutional controls; (4) pilot testing of potential institutional control tools, such as outreach campaigns developed using community based social marketing principles; (5) assessment of the pilot test and revisions to the plan, and (6) assessment of the plan's success and recommendations for future ICs on the LDW.
- 2.2** Respondents shall provide support for planning and managing the meetings of the Healthy Fish Consumption Consortium.
- 2.3** Respondents shall fund a cooperative agreement between EPA and Public Health Seattle & King County. The tasks under the Cooperative Agreement include: establishing a community based participatory process and producing a Duwamish Seafood Consumption IC Plan; providing on-going direct health promotion and outreach to implement the Duwamish Seafood Consumption ICs; building capacity of community partners that serve the affected communities to design, pilot test and implement community focused IC tools; monitoring and evaluating the IC program effectiveness, as well as provide regular Progress Reports; and developing recommendations for adaptively managing the program and ensuring continued community capacity building.

3. REMEDIAL DESIGN

- 3.1** The remedial design is generally defined as those activities to be undertaken to develop final construction plans and specifications, general provisions, special requirements, and all other technical documentation necessary to solicit bids for construction of the remedial action. The remedial design also includes identification of the required documentation to be provided by the construction contractor, subject to approval by EPA during the construction phase, and annotated outlines, conceptual plans, or initial drafts of certain documents to be finalized after construction.
- 3.2** Respondents shall design the selected remedy in the LDW ROD as it applies in the LDW Upper Reach. The LDW Upper Reach (LDW-UR) is defined as River Mile 3.0 to River Mile 5.

- 3.3** Plans and specifications shall be submitted in accordance with the schedule set forth in Section 5 of this SOW. Subject to inclusion in the RD Work Plan and approval by the EPA, Respondents may submit more than one set of design submittals reflecting different components of the remedial action. Remedial design work, including plans and specifications, shall be developed in accordance with the EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive No. 9355.0-4A) and shall demonstrate that the remedial action shall meet all requirements of the ROD. The Respondents shall meet regularly with the EPA to discuss design issues.
- 3.4** Respondents shall use EPA guidance documents as the basis for development of work plans, quality assurance project plans, sampling plans, water quality monitoring plans, and other documents. The remedial design and supporting deliverables shall be consistent with current technical guidance, including but not limited to Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, 2005; Guidance for In Situ Subaqueous Capping of Contaminated Sediments, 2012; Contaminated Sediments Remediation: Remedy Selection for Contaminated Sediments, 2014, and shall meet professional engineering standards for sediment remediation sites.
- 3.5** Remedial Design will progress from the preliminary design phase (30%) through 60%, 90%, and final (100%), with deliverables as identified below and in the RDWP. As information is developed during the phases of design, Respondents shall be prepared to present information and receive input through the Community Involvement process, which includes the Roundtable and other public fora.

4. PERIODIC MONITORING OF SELECTED SITE CONDITIONS

- 4.1** Respondents shall repeat elements of the Pre-Design Studies work plan developed under RI/FS AOC Amendment #3 for the Site as a whole (1) to assess fish and crab tissue concentrations for Remedial Action Objective 1 risk drivers as conditions in the waterway continue to change due to remediation activities and ongoing source control; and (2) to assess PCB trends in near-bottom surface water using passive samplers. Respondents shall perform this monitoring no less than five years from the baseline monitoring performed under AOC3 unless it is performed pursuant to another administrative order or Consent Decree.
- 4.2** For work to be done under this section, Quality Assurance Project Plan (QAPP) addendums and a data report that includes data evaluation (see supporting documents) shall be submitted per the Schedule of Deliverables in Section 5.

5. DELIVERABLES

5.1 Applicability. Respondents shall submit deliverables for EPA comment or approval or comment as specified in the Section 5. Copies of deliverables shall be provided, as directed by EPA, to Ecology, the Muckleshoot Tribe, and the Suquamish Tribe to ensure a reasonable opportunity for review and comment. As requested by EPA, Respondents shall provide additional hard copies for use in Community Involvement, including the LDW Roundtable.

5.2 Technical Specifications

- (a) LDWG shall submit electronic data in accordance with the Region 10 Data Management Plan (May 2014) and associated guidance and templates. Respondents shall submit sampling and monitoring data in Region 10 Electronic Data Deliverable (EDD) format. Respondents shall upload the data into EPA's SCRIBE and into Ecology's EIM database. Respondents shall provide EPA with a copy of the files created to load data into the EPA database.
- (b) Spatial data, including spatially-referenced data and geospatial data, shall be submitted following the procedures in the "U.S. EPA Region 10 Geographic Information Systems (GIS) for External Entities"; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). The GIS data must be submitted to EPA on disc at the same time as the final reports are submitted. If requested by EPA, LDWG shall provide GIS data used in sampling plans, QAPPs, reports, or other submittals where GIS and mapping programs were used to generate maps, diagrams, and other visual aids. Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at <https://edg.epa.gov/EME/>.
- (c) Each file must include an attribute name for each site unit or sub-unit submitted. Consult <https://www.epa.gov/geospatial/geospatial-policies-and-standards> for any further available guidance on attribute identification and naming.
- (d) Spatial data submitted by Respondents does not, and is not intended to, define the boundaries of the Site.

5.3 Remedial Design Work Plan. Respondents shall submit a Remedial Design (RD) Work Plan (RDWP) for EPA approval. The RDWP shall include a proposed plan and schedule for implementing all RD activities for the LDW Upper Reach and

identification and development of all RD supporting documents. The RDWP must include:

- (a) A description of the overall management strategy for performing the RD.
- (b) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring in the LDW Upper Reach;
- (c) A description of the responsibility and authority of all organizations and key personnel involved with the development of the RD;
- (d) A discussion of additional challenges, data needs, investigations or retesting necessary to initiate or complete the remedial design (e.g., how to characterize and remediate areas with structural or access restrictions);
- (e) A Pre-Design Investigations (PDI) Work Plan, as specified in Section 4.4.
- (f) Descriptions of any applicable permitting requirements and other regulatory requirements (including but not limited to Applicable or Relevant and Appropriate Requirements (ARARs) identified in the ROD);
- (g) Description of plans for obtaining access in connection with RD and RA, such as property acquisition, property leases, and/or easements, and for developing institutional controls in accordance with the ROD;
- (h) Proposed approach to reporting data from Pre-Design Investigation (PDI);
- (i) Discussion of existing data (e.g., upstream suspended solids data, source control storm drain solids data, flow and other hydrodynamic data, pre-design data, and EAA monitoring data) and data to be collected as part of design or following construction that will assist in anticipating the quality of surface sediments over time. This discussion shall include a conceptual site model (CSM) that considers suspended and bedded sediments, including dredge residuals, and how they move during and after construction, to aid in interpreting monitoring outcomes in the Upper Reach; and
- (j) A comprehensive listing and brief description of elements of remedial design to be addressed or supporting deliverables to be submitted as part of remedial design, including but not limited to those listed below or described in ¶ 4.9 (Components of Supporting Deliverables).
 - (1) QAPPs and health and safety plan [HSP].
 - (2) Remedial action basis of design report, including.
 - (i) Narrative basis of design of dredge, cap, ENR, and MNR>SCO elements, including supporting technical evaluations.

- (ii) Permitting and site access.
- (iii) Construction sequence, scheduling and cost estimate.
- (iv) Anticipated long-term monitoring and maintenance approaches, including any expected measures for climate change adaptation.
- (v) Evaluation of institutional controls requirements for caps
- (vi) Archaeological monitoring and discovery.
- (vii) Transportation and disposal approaches.
- (viii) Scheduling and coordination of work under this SOW with other in-water work or navigation or development projects on the bank and intertidal or subtidal areas, if they may substantively affect remedial design or construction in the LDW Upper Reach.
- (ix) Green and sustainable remediation evaluation and implementation approach.
- (x) Approach to implementation and assurance of institutional controls.
- (xi) Geotechnical basis of design.
- (xii) Sediment excavation prism verification.
- (3) Water quality monitoring plan.
- (4) Biological assessment.
- (5) Construction quality assurance plan.

5.4 Pre-Design Investigation. The purpose of the PDI is to address data needs for completion of design, by conducting field investigations.

- (a) **PDI Work Plan.** Respondents shall submit a PDI Work Plan (PDIWP) per Section 4.4.b, for EPA approval. The PDIWP must include:
 - (1) An evaluation and summary of existing data and description of data gaps;
 - (2) A strategy for timely characterization, testing or data gathering to support delineation of areas where each remedial technology applies and engineering design, a discussion of the timing and type of data collection needed to document ARARs compliance, and a plan for natural recovery monitoring where required;

- (3) A conceptual sampling plan including proposals and clearly stated rationales for any proposed tiering analyses or phasing of work to refine recovery categories, apply remedial technologies, including natural recovery, and design the remedy. The sampling plan shall identify media to be sampled, general location type and purpose, field sampling and lab analyses, bathymetric, hydrogeologic, and geotechnical studies, and an estimated number and spatial density of samples; and
 - (4) A schedule for implementing the PDI work.
- (b) **PDI Quality Assurance Project Plan.** A QAPP addresses sample collection, analysis and data handling. The QAPP must include a field sampling plan and an explanation of Respondents' data quality objectives, quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. The QAPP shall address disposal of Investigation Derived Waste. Respondents shall submit a QAPP for each field sampling effort and shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005).
- (1) To ensure that Respondents' Labs perform all analyses using EPA-accepted methods (i.e., the methods documented in EPA Contract Laboratory Program (CLP) SOW for Inorganic Superfund Methods (ISM02.4, October, 2016); EPA CLP SOW for Organics Superfund Methods (SOM02.4, October, 2016); EPA CLP SOW for High Resolution Superfund Methods (HRSM01.2, October, 2014), or as updated; other methods acceptable to EPA;
 - (2) To ensure that Respondents' Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;
 - (3) To ensure that Respondents validate data in accordance with EPA-accepted data validation guidelines: National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA-540-R-2017-001, January, 2017); National Functional Guidelines for Organic Superfund Methods Data Review (EPA-540-R-2017-002, January, 2017) National Functional Guidelines for High Resolution Superfund Methods Data Review (EPA-542-B-16-001, April, 2016) or as updated.
- (c) **PDI Health and Safety Plan(s).** A Health and Safety Plan (HASP) describes all activities to be performed to protect on site personnel and others transiting the area or living or working nearby from physical, chemical, and all other hazards posed by the Work. Respondents shall develop HASPs in accordance with EPA's Emergency Responder Health and Safety and Occupational Safety and Health

Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. EPA does not approve the HASP, but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.

- (d) **PDI Data.** Respondents shall submit data in accordance with the Schedule of Deliverables.
- (e) **PDI Data Evaluation Report.** This report shall include:
 - (1) Summary of the investigations performed;
 - (2) Summary of investigation results;
 - (3) Narrative interpretation of data and results, with supporting figures and tables, including updated graphics (similar to ROD Figure 18 or more detailed) of where specific remedial technologies and details of how the decision trees in the ROD (Figure 19 and corrected Figure 20) were applied;
 - (4) Results of statistical and modeling analyses, as applicable;
 - (5) Photographs documenting the work conducted; and
 - (6) Conclusions and recommendations for RD, including design parameters and criteria, and identification of any remaining data gaps needed to support the design.

5.5 Should additional data be needed to support the design, a QAPP addendum shall be submitted 30 days after submittal of the draft PDI Data Evaluation Report.

5.6 Preliminary (30%) RD. Respondents shall submit a Preliminary (30%) RD for EPA's comment. The Preliminary RD must include the following elements and deliverables:

- (a) A basis of design report providing descriptions of the analyses conducted to select the design approach, including a summary and detailed justification of design assumptions, restrictions and objectives to be used in design of the selected remedy; Essential supporting calculations shall be included (at least one sample calculation presented for each significant or unique design calculation, such as cap thickness or propeller wash modeling)
- (b) Preliminary plans and drawings, and a list of all drawings to be included in the intermediate, pre-final and final design;
- (c) An outline of required specifications;

- (d) Identification of candidate transloading location(s), transport methods, and permitted upland off-site landfill facility, and import material sources
 - (e) A schedule, contracting strategy, contractor requirements, any needed controls and monitoring to comply with ARARs and minimize impacts (in accordance with Section 13.2.5 and Section 13.2.8 of the ROD), and plans to manage potential conflicts with other in-water work, treaty-protected uses, navigation, recreation and commerce, and upland developments and land use changes that may affect remedial design and construction in the Upper Reach;
 - (f) Access and easement requirements.
 - (g) Descriptions of how compliance with ARARs will be achieved and documented, specifying documentation requirements associated with ARARs identified in Table 26 (such as a Biological Assessment, Compensatory Mitigation Plan if needed, Archaeological Discovery plan);
 - (h) An outline and description of Long Term Maintenance, and Monitoring Plan (LTMMP) elements for the Upper Reach;
 - (i) An outline of an Institutional Controls Implementation and Assurance Plan (ICIAP), including an evaluation of the most appropriate institutional, proprietary controls and location-specific use restrictions needed to ensure long-term effectiveness, consistent with ROD Section 13.2.4 (This ICIAP is distinct from plans developed under Section 2 of this SOW).
- 5.7 Intermediate (60%) RD.** Respondents shall submit the Intermediate (60%) RD for EPA's comment. The Intermediate RD must: (a) be a continuation and expansion of the Preliminary RD; (b) address EPA's comments regarding the Preliminary RD; and (c) include the elements and deliverables required for the Preliminary (30%) RD at a 60% level of completion.
- 5.8 Pre-Final (90%) RD.** Respondents shall submit the Pre-final (90%) RD for EPA's comment. The Pre-final RD must be a continuation and expansion of the previous design submittal and must address EPA's comments regarding the Intermediate RD. The Pre-final RD will serve as the approved Final (100%) RD if EPA approves the Pre-final RD without comments. The Pre-final RD must include:
- (a) A complete set of construction drawings and specifications that are: (1) certified by a registered Professional Engineer; (2) suitable for procurement; and (3) follow the Construction Specifications Institute's MasterFormat (or equivalent) and meet other relevant standards for design of sediment cleanup;
 - (b) A survey and engineering drawings showing existing features in the LDW Upper Reach, such as property boundaries, easements, bathymetry, structures to be protected or removed, and other relevant conditions;

- (c) A specification for all necessary construction documentation, including but not limited to photographs and videos, bathymetric surveys, and GPS coordinates); and
- (d) Those elements listed for the Preliminary Design, as well as the following (unless previously approved by the EPA):
- (e) Draft Construction Quality Assurance Plan (CQAP).
- (f) Draft Water Quality Monitoring Plan.
- (g) Draft QAPP/HSP for remedial action construction and monitoring activities.
- (h) Draft Permitting and Site Access Plan.
- (i) Outline of ICIAP, including specific IC elements for each affected area.
- (j) Required elements of a vessel management plan (to be finalized by contractor)
- (k) Annotated outline and conceptual description of LTMMP elements specific to the Upper Reach, discussing how the elements and schedule fit into a likely LTMMP approach for the LDW site as a whole.
- (l) Habitat Area Identification. For the purpose of complying with Endangered Species Act and Section 404 of the Clean Water Act (CWA) (see Table 26 of the ROD), Respondents shall identify habitat areas and proposed elevations and substrate materials for caps, ENR, or placement of backfill materials in any identified habitat areas and shall identify any areas where loss of aquatic habitat is unavoidable.
- (m) Draft Biological Assessment.
- (n) Draft CWA 404 and Section 10 Rivers and Harbors Act of 1899 memorandum
- (o) Engineer's Capital and Operation and Maintenance Cost Estimate.
- (p) Engineer's Construction Project Schedule.
- (q) Community Outreach and Communications Plan
- (r) Any additional plans identified in the Remedial Design Work Plan.

5.9 Final (100%) RD. Respondents shall submit the Final (100%) RD for EPA approval. The Final RD must address EPA's comments on the Pre-final RD and must include final versions of all Pre-final RD elements and deliverables. The ICIAP and LTMMP will remain as annotated outlines in the Final RD.

5.10 Components of Remedial Design Reports. Respondents shall submit each of the following supporting deliverables for EPA approval with each Remedial Design submittal, except as specified in Sections 5.6, 5.7, and 5.8 above. Respondents shall develop the deliverables in accordance with all applicable regulations, guidance, and policies (see Section 7 (References)). Respondents shall update and refine supporting deliverables related to design in accordance with the degree of design completion (30/60/90/100%) or as directed by EPA.

- (a) **LDW Upper Reach Water Quality Monitoring Plan.** The purpose of the LDW Upper Reach Water Quality Monitoring Plan (WQMP) is to obtain information during construction to identify water quality impacts that may be caused by remedy construction; The WQMP must include:
- (1) Description of the data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;
 - (2) Description of how performance data will be analyzed, interpreted, and reported, and/or other Site-related requirements;
 - (3) Description of the communications and response protocols to respond to detected exceedances of water quality parameters as defined in the EPA 401 memo;
 - (4) Description of deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, data reports and data evaluation reports to EPA; and
 - (5) Description of additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) that would be triggered in the event that monitoring results indicate higher than expected concentrations of TSS or the contaminants of concern in surface water.
- (b) **Construction Quality Assurance Plan.** The purpose of the CQAP is to describe planned and systemic activities that provide confidence that the RA construction will satisfy all plans, specifications, and related requirements, including quality objectives. In addition, the purpose is to describe the activities to verify that RA construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQAP must:
- (1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQAP;

- (2) Describe the requirements to be met to achieve completion of the LDW Upper Reach RA;
 - (3) Describe the key performance standards and quality control elements required of the Contractor in the technical specifications;
 - (4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQAP
 - (5) Describe procedures for tracking construction deficiencies from identification through corrective action;
 - (6) Describe procedures for documenting all CQAP activities; and
 - (7) Describe procedures for retention of documents and for final storage of documents.
- (c) **Emergency Response Plan.** Specifications for an Emergency Response Plan (ERP) shall be submitted as part of the 30/60/90 and 100% design submittal to address requirements for clear procedures in the event of an accident or emergency during remedial construction (for example, vessel or equipment damage, failure or power outages, unauthorized discharges to water, water impoundment failure, bank slope failure, etc.). The ERP may be updated in future as part of the remedial action work plan (RAWP). Specifications for the ERP shall address:
- (1) Name of the person or entity responsible for responding in the event of an emergency incident;
 - (2) Plans for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;
 - (3) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), consistent with the regulations under 40 C.F.R. Part 112, describing measures to prevent, and contingency plans for, spills and discharges;
 - (4) Notification activities in the event of a release of hazardous substances requiring reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004; and
 - (5) A description of all necessary actions in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.

- (d) **Community Outreach and Communications Plan (COCP).** The COCP shall describe actions being taken to minimize the potential impacts including safety issues of remedy implementation on the community (e.g. residents, businesses, fishers, commuters, waterway users) and a plan for communicating with and responding to the community. Safety and other community concerns about construction will also be discussed with the Round Table during RD.
- (e) **Archeological Discovery Plan.** For the purpose of complying with historical and archaeological preservation requirements, Respondents shall document any districts, sites, buildings, structures or objects included or eligible for inclusion in the National Register of Historic Places potentially impacted by remedy implementation and shall include specifications for an archaeological discovery plan to ensure protection of Native American artifacts and cultural or archaeological resources.
- (f) **Biological Assessment.** With the 90% RD, Respondents shall submit a biological assessment for EPA review and use in consultation related to the Endangered Species Act.
- (g) **Compensatory Mitigation Plan.** If necessary to comply with Clean Water Act Section 404 requirements, Respondents shall submit a plan for compensatory mitigation.
- (h) **Section 408 Compliance Documentation.** Respondents shall include documentation necessary to evaluate compliance with 33 U.S.C. Section 403 and Section 408.

6. SCHEDULE

- 6.1 **Applicability and Revisions.** All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Schedule of Deliverables set forth below. Deliverables not identified below shall be due in accordance existing requirements (progress reports), an EPA approved schedule proposed by Respondents or as directed by EPA. Respondents may propose changes to the Schedule of Deliverable for EPA approval. Upon EPA's approval, the revised schedule supersedes the schedule set forth below and previously-approved schedules.
- 6.2 **General.** Unless otherwise approved by EPA, submittal revisions following initial EPA comments shall be due 30 days from receipt of the comments. Subsequent revisions shall be due 14 days or as directed in EPA comments on the prior revision.

**Schedule of Deliverables –
Fourth Amendment of RI/FS AOC**

Item	Deliverable, Task	SOW or (AOC) reference	Deadline
1	Notification of contractor/sub-contractor selection	(RI/FS AOC VIII, 1)	150 days from Amendment #4 effective date
2	RDWP	5.3	120 days from Issuance of Notice to Proceed to Contractor
3	PDIWP	5.4a	same as #2 above
4	PDI QAPP/HSP	5.4b/c	60 days after receipt of EPA comments on the revised draft PDIWP
5	Completion of PDI field work	5.4a	In accordance with the schedule in the approved PDIWP, unless otherwise approved by EPA.
6	PDI Data	5.4d	For each round of data collection, 10 days after Respondents' receipt of validated PDI sampling data.
7	PDI Data Evaluation Report – Phase I	5.4e	60 days after Respondents' submittal of PDI data for first phase of data collection to EPA.
8	PDI Data Evaluation Report – Phase II	5.4e	45 days after Respondents' submittal of PDI data for second phase of data collection to EPA.
9	Preliminary (30%) RD submittal	5.6	45 days from EPA approval of PDI Data Evaluation Report - Phase II.
10	Intermediate (60%) RD Submittal	5.7	120 days after EPA comments on Preliminary RD.
11	Pre-final (90%) RD Submittal	5.8	90 days after EPA comments on Intermediate RD.
12	Final (100%) RD	5.9	60 days after EPA comments on Pre-final RD.
13	Periodic Monitoring QAPP Addendum	4.2	4 years from Amendment #4 effective date
14	Periodic Monitoring Data / Evaluation Report	4.2	5 years from Amendment #4 effective date

7. REFERENCES

7.1 The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the two EPA Web pages listed in ¶ 7.2:

- (a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).
- (b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).
- (c) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).
- (d) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G-90/001 (Apr. 1990).
- (e) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).
- (f) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).
- (g) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).
- (h) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. Part 300 (Oct. 1994).
- (i) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).
- (j) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).
- (k) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).
- (l) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).
- (m) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).

- (n) Quality management systems for environmental information and technology programs -- Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).
- (o) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005).
- (p) USEPA Office of Solid Waste and Emergency Response. Geospatial Superfund Site Data Definition and Recommended Practices Memo. OLEM Directive 9200.2-191. (November 29, 2017)
- (q) Principles for Greener Cleanups (Aug. 2009), <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>.
- (r) Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, EPA-540-R-05-012 Office of Solid Waste and Emergency Response OSWER 9355.0-85 December 2005
- (s) Guidance for In Situ Subaqueous Capping of Contaminated Sediments, USACE 2012
- (t) Contaminated Sediments Remediation: Remedy Selection for Contaminated Sediments, ITRC 2014
- (u) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM02.4 (October 2016).
- (v) USEPA Contract Laboratory Program Statement of Work for Organic Superfund Methods (Multi-Media, Multi-Concentration), ISM02.4 (October 2016).
- (w) EPA CLP SOW for High Resolution Superfund Methods (HRSM01.2, October, 2014)
- (x) National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA-540-R-2017-001, January, 2017)
- (y) National Functional Guidelines for Organic Superfund Methods Data Review (EPA-540-R-2017-002, January, 2017)
- (z) National Functional Guidelines for High Resolution Superfund Methods Data Review (EPA-542-B-16-001, April, 2016)
- (aa) Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance," OSWER 9355.7-18 (Sep. 2011).

- (bb) Construction Specifications Institute's MasterFormat 2012, available from the Construction Specifications Institute, <http://www.csinet.org/masterformat>.
- (cc) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012).
- (dd) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012).
- (ee) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), <https://www.epa.gov/superfund/superfund-post-construction-completion>.
- (ff) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003. Mar. 2001, reissued May 2006.

7.2 A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance <https://www.epa.gov/superfund/superfund-policy-guidance-and-laws>

Test Methods Collections <https://www.epa.gov/measurements/collection-methods>

For any regulation or guidance referenced in the RI/FS AOC or Amendment #4 the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance.

In December 2000, the City of Seattle, King County, the Port of Seattle, and the Boeing Company (“Respondents”) entered into an *Administrative Order on Consent for Remedial Investigation/Feasibility Study*, U.S. EPA, Region 10 Docket No. CERCLA 10-2001-0055, Ecology Docket No 00TCPNR-1895 (12/20/2000) (the “RI/FS AOC”) with the United States Environmental Protection Agency (“EPA”) and the Washington State Department of Ecology (“Ecology”). Respondents performed a remedial investigation and feasibility study for the Lower Duwamish Waterway Superfund Site (“Site” or “LDW”) under the oversight of EPA and Ecology pursuant to the RI/FS AOC. The RI/FS AOC has been amended Four times to provide for the performance of additional studies related to the Site. The First Amendment, effective March 19, 2013, provides for the performance of the Fisher Study for the LDW. The Second Amendment, effective July 17, 2014, provides for the performance of the Enhanced Natural Recovery (ENR)/Activated Carbon (AC) pilot study. The Third Amendment, effective April 27, 2016, provides for the performance of pre-remedial design studies. The Fourth Amendment, effective July 9, 2018, provides for remedial design (RD) of the LDW Upper Reach. The Respondents continue to perform these studies pursuant to the terms of the RI/FS AOC.

The EPA issued a record of decision for the Site on November 21, 2014 (the “Lower Duwamish Waterway ROD”). The Lower Duwamish Waterway ROD selected remedial actions for the in-waterway portion of the Site.

Source control is an integral part of the strategy for addressing contamination throughout the Site. An objective of the source control is to find and sufficiently control sources before commencing in-waterway remediation. Ecology is the lead agency for implementing source control actions and uses its existing regulatory authorities to control sources. For purposes of assessing adequacy of source control in the immediate source area to the LDW, Ecology has divided the LDW into three reaches: upper, middle, and lower. Consistent with Sections 4.2 and 13.2.7 of the LDW ROD, EPA intends to commence remedial action for the LDW Site or a segment thereof after a source control determination for the LDW Site or segment thereof is made.

The objectives of this Fifth Amendment are to: 1) design the remedy for river mile 1.6 to river mile 3 of the Lower Duwamish Waterway Superfund Site (the “LDW Middle Reach”), consistent with the Lower Duwamish Waterway ROD and CERCLA; (2) summarize available Puget Sound seafood data, identify data gaps, and recommend additional sampling, as necessary, to refine ROD background levels of contamination in seafood; (3) provide for timely periodic monitoring of clam tissues to correspond with fish and crab tissue sampling under the Fourth Amendment; and (4) continue support of the seafood consumption institutional controls for the Site following completion of the Fourth Amendment. The attached Scope of Work (SOW) provides an overview of the work to be performed, a list of deliverables, and a schedule for these deliverables.

Fifth Amendment

EPA, Ecology, and Respondents agree to amend the RI/FS AOC as follows:

1. The work performed pursuant to this Fifth Amendment shall comply with CERCLA and its implementing regulations, the National Contingency Plan, 40 C.F.R. Part 300 and shall be subject to the review and approval of EPA. With the exceptions of the authority to review (except as a support agency) and approve work, resolve disputes (excluding Ecology’s ability to resolve disputes related to its cost recovery), or enforce work performed under this Fifth Amendment and any subsequent amendment to the RI/FS AOC, Ecology shall retain all rights and obligations it has under the RI/FS AOC, including those rights of access and cost recovery conferred to it by Sections XIV and XXII of the RI/FS AOC. EPA will provide Ecology with an opportunity to review and comment on any submittal requiring EPA approval before EPA approves, modifies or disapproves the submittal. However, a failure by EPA to allow such an opportunity to Ecology shall not be a basis for Respondents to dispute an EPA decision to approve, modify or disapprove a submittal.
2. EPA and Respondents may by written agreement modify the work provided for by this Fifth Amendment.

3. For the purposes of this Fifth Amendment, Paragraph 3 of Section X (Modification of the Work Plan) of the RI/FS AOC shall be deleted and replaced by the following:

EPA may identify gaps in the work required under the Fifth Amendment that prevent the accomplishment of the objectives of the Fifth Amendment as defined above. In that event, EPA may request in writing that LDWG perform additional work under this Fifth Amendment, as necessary for the accomplishment of these objectives. Respondents shall confirm their willingness to perform such additional work, in writing, to EPA within twenty-one (21) days of receipt of the EPA request, or Respondents shall invoke dispute resolution. Subject to EPA resolution of any dispute, Respondents shall implement the additional work requested by EPA. The additional work shall be completed according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to a plan or written work plan supplement. EPA reserves the right to conduct the work at any point, to seek reimbursement from Respondents, and/or seek any other appropriate relief. If EPA determines that conditions at the Site are creating or have the potential to create a danger to human health or welfare on-site or in the surrounding area or to the environment, EPA may order Respondent to stop further implementation of this Order for such period of time in the judgement of EPA is needed to abate the danger.

4. The amounts paid by Respondents to the EPA Hazardous Superfund pursuant to the requirements of Section XXII (Payment of EPA Oversight Costs) of the RI/FS AOC shall be deposited by EPA into the Lower Duwamish Waterway Superfund Site Special Account pursuant to Section XXI (Reservations of Rights and Reimbursement of Costs) of the RI/FS AOC to be retained and used to conduct or finance response actions at or in connection with the Site. In addition, EPA has several other site-specific accounts related to the Site within the EPA Hazardous Superfund. Funds held in such site specific accounts may be transferred to the Lower Duwamish Waterway Superfund Site Special Account if EPA determines that the funds are no longer needed to finance or otherwise support the implementation of response actions related to response action for which such site specific account was created. After completion of response actions at or in connection with the Site, any funds remaining in the Lower Duwamish Waterway Site Specific Account may be transferred by EPA to the EPA Hazardous Substance Superfund.
5. Remove and replace Paragraph 1 of Section XV with the following:

All deliverables under this AOC shall be submitted in writing unless otherwise specified. All deliverables must be submitted by deadlines in

the SOW attached to this Amendment or as otherwise approved by EPA. Unless otherwise requested by the EPA Project Coordinator, Respondents shall submit all deliverables to EPA in electronic form (native format and web-ready pdf) with a single hard copy of the first draft and the final version of all documents subject to EPA comment. Technical specifications for sampling and monitoring data and spatial data are addressed in the SOW attached to this Amendment. If any deliverable includes maps, drawings, or other exhibits that are in color or larger than 8.5" by 11", Respondents shall also provide EPA with paper copies of such exhibits.

6. The list of deliverables identified in Paragraph 4 of Section XIX (Delay in Performance, EPA Stipulated Penalties, Enforcement) of the RI/FS AOC is amended to delete deliverables (3) through (6) and to include the original and revised Remedial Design Work Plan, and originals of the Preliminary Remedial Design, the Intermediate Remedial Design, the Pre-Final Remedial Design, and the Final Remedial Design.
7. The basis for violations identified in Paragraph 5 of Section XIX (Delay in Performance, EPA Stipulated Penalties, Enforcement) is amended to delete deliverables (1) through (9) and to include the original and final deliverables requiring EPA approval identified in the attached SOW except for a monthly progress report and those deliverables identified in Paragraph 6 above.
8. Respondents shall, subject to and conditioned upon the prior approval of EPA, implement the activities required by the attached SOW, which is incorporated into and enforceable under the terms of the RI/FS AOC as amended by this Fifth Amendment.

It is so ORDERED AND AGREED this _____ day of _____, 2021.

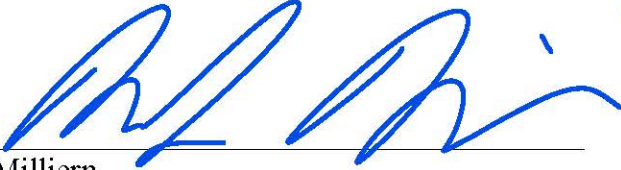
KIRA LYNCH

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LYNCH
Date: 2021.07.08 15:09:03
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BY: _____

DATE: _____

Kira Lynch
Chief, Remedial Cleanup Branch Unit Manager of the Superfund and Emergency
Management Division
Region 10
United States Environmental Protection Agency

By: 

DATE: 7/8/2021

Brock Milliern
Program Manager
Toxics Cleanup Program
Washington Department of Ecology

EFFECTIVE DATE: _____

Agreed this 24th day of June, 2021

For Respondent Port of Seattle

By: Stephen P. Metruck  Digitally signed by
Stephen P. Metruck
Date: 2021.06.24
22:30:20 -07'00'

Name **Stephen P. Metruck**

Title **Executive Director**

Agreed this ____ day of _____, 2021
For Respondent City of Seattle

By: Jenny A. Durkan

Name

Title

Agreed this 1 day of JUNE, 2021
For Respondent King County

By: Daw Constantine
Name DON CONSTANTINE
Title EXECUTIVE

Agreed this 29 day of June, 2021
For Respondent The Boeing Company

By: SC L. Sifestas
Name STEVEN L. SIFESTAS
Title Senior Director
Environmental Sustainability
The Boeing Co.

REMEDIAL DESIGN
STATEMENT OF WORK
LDW MIDDLE REACH
LOWER DUWAMISH WATERWAY SUPERFUND SITE
Seattle, King County, State of Washington
EPA Region 10
May 2021

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1. INTRODUCTION AND BACKGROUND

- 1.1 Introduction.** This Statement of Work (SOW) sets forth the procedures and requirements for implementing Amendment #5 (also referred to as AOC5 or the Fifth Amendment) of the Administrative Order on Consent for Remedial Investigation (RI)/Feasibility Study (FS) of the Lower Duwamish Waterway Superfund Site (Site or LDW) (U.S. EPA Region 10 Docket No. CERCLA 10-2001-0055, Ecology Docket N. 00TCPNR-1895, RI/FS AOC). Amendment #5 work includes remedial design for the middle reach of the Site, as defined in Section 3.2 below, and other tasks enumerated in this SOW, in accordance with the Record of Decision for the Site signed November 21, 2014 (ROD).

Work associated with sitewide Seafood Consumption Institutional Controls, periodic monitoring of fish, crabs, and surface water, and design of the remedy for the Upper Reach will continue under AOC4. Upon EPA approval of the 100% design submittal for the Upper Reach, Respondents shall continue the Seafood Consumption Institutional Controls work under AOC5, as described in this SOW, until EPA approval of the 100% design submittal for the Middle Reach. Respondents shall ensure that work under AOC5 and AOC4 is coordinated to minimize conflicts and address design needs for overlapping or contiguous areas.

1.2 Structure of the SOW.

- Section 2 (Continued Implementation of Seafood Consumption Institutional Controls (ICs)) sets forth the process for continuing to support the implementation of institutional controls related to seafood consumption.
- Section 3 (Remedial Design) sets forth the process for developing the Remedial Design (RD), which includes the submission of specified primary deliverables.
- Section 4 (Periodic Monitoring of Selected Site Conditions) sets forth elements of site monitoring to be performed by the year 2023.
- Section 5 (Compilation and Assessment of Fish and Shellfish Tissue Data to Refine Background Concentrations) sets forth the process for recommending additional fish and shellfish sampling if needed to further refine background tissue concentrations, as required per Section 8.3.2 of the ROD.
- Section 6 (Deliverables) describes the content of supporting deliverables and the general requirements regarding Respondents' submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 7 (Schedule) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the RD.
- Section 8 (References) provides a list of references, including URLs.

The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the RI/FS AOC, have the meanings assigned to them in CERCLA, in such regulations, or in the RI/FS AOC, except that the term “Paragraph” or “¶” means a paragraph of the SOW, and the term “Section” means a section of the SOW, unless otherwise stated.

2. CONTINUED IMPLEMENTATION OF SEAFOOD CONSUMPTION ICs

- 2.1** This section incorporates Support for Implementation of Seafood Consumption Institutional Controls. Respondents are responsible for costs incurred by EPA related to work performed under this section from the date of EPA approval of the upper reach Final (100%) Remedial Design through the date of EPA approval of the middle reach Final (100%) Remedial Design. Respondents shall provide, fund, or participate in the following: (1) a planning group responsible for implementation of a plan for institutional controls; (2) incentives for participation on the planning group by community members who have relevant knowledge or experience, subject to public agencies’ legal authority to provide such incentives; (3) technical materials to support the institutional controls; (4) pilot testing of potential institutional control tools, such as outreach campaigns developed using community based social marketing principles; (5) revisions to the plan, and (6) assessment of the plan’s success and recommendations for future ICs on the LDW.
- 2.2** Respondents shall provide support for planning and managing the meetings of the Healthy Fish Consumption Consortium.
- 2.3** Respondents shall fund a cooperative agreement between EPA and Public Health Seattle & King County. The tasks under the Cooperative Agreement include: continuation of a community based participatory process for the Duwamish Seafood Consumption IC Plan; providing on-going direct health promotion and outreach to implement the Duwamish Seafood Consumption ICs; building capacity of community partners that serve the affected communities to design, pilot test and implement community focused IC tools; monitoring and evaluating the IC program effectiveness, as well as providing regular Progress Reports; and developing recommendations for adaptively managing the program and ensuring continued community capacity building.

3. REMEDIAL DESIGN

- 3.1** The remedial design is generally defined as those activities to be undertaken to develop final construction plans and specifications, general provisions, special requirements, and all other technical documentation necessary to solicit bids for construction of the remedial action. The remedial design also includes identification of the required documentation to be provided by the construction contractor, subject to approval by EPA during the construction phase, and annotated

outlines, conceptual plans, or initial drafts of certain documents to be finalized after construction.

- 3.2 Respondents shall design the selected remedy in the LDW ROD as it applies in the LDW Middle Reach. The LDW Middle Reach (LDW-MR) is defined as River Mile 1.6 to River Mile 3.0.
- 3.3 Plans and specifications shall be submitted in accordance with the schedule set forth in Section 7 of this SOW. Subject to inclusion in the RD Work Plan and approval by the EPA, Respondents may submit more than one set of design submittals reflecting different components of the remedial action. Remedial design work, including plans and specifications, shall be developed in accordance with the EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive No. 9355.0-4A) and shall demonstrate that the remedial action shall meet all requirements of the ROD. The Respondents shall meet regularly with the EPA to discuss design issues.
- 3.4 Respondents shall use EPA guidance documents as the basis for development of work plans, quality assurance project plans, sampling plans, water quality monitoring plans, and other documents. The remedial design and supporting deliverables shall be consistent with current technical guidance, including but not limited to Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, 2005; Guidance for In Situ Subaqueous Capping of Contaminated Sediments, 2012; Contaminated Sediments Remediation: Remedy Selection for Contaminated Sediments, 2014, and shall meet professional engineering standards for sediment remediation sites.
- 3.5 Remedial Design will progress from the preliminary design phase (30%) through 60%, 90%, and final (100%), with deliverables as identified below and in the RDWP. As information is developed during the phases of design, Respondents shall be prepared to present information and receive input through the Community Involvement process, which includes the Roundtable and other public fora.

4. PERIODIC MONITORING OF SELECTED SITE CONDITIONS

- 4.1 AOC Amendment #4 requires Respondents to repeat elements of the Pre-Design Studies work plan developed under RI/FS AOC Amendment #3 for the Site as a whole, specifically to assess dissolved PCBs in near bottom surface water using passive samples and to sample fish and crab tissue samples for Remedial Action Objective 1 contaminants of concern as conditions in the waterway continue to change due to remediation activities, natural recovery processes, and ongoing source control.
- 4.2 Under AOC Amendment #5, Respondents shall add collection of clam tissue data to the AOC Amendment #4 fish and crab sampling. Sampling plans and reports

prepared for AOC Amendment #4 periodic monitoring work shall include clam sampling plans and results.

5. COMPILATION AND ASSESSMENT OF FISH AND SHELLFISH TISSUE TO REFINER BACKGROUND CONCENTRATIONS

- 5.1** Section 8.2.3 of the ROD states that fish and shellfish target tissue concentrations based on background data are uncertain because they were developed with a limited dataset. The ROD calls for collection of additional fish and shellfish background data during the remedial design phase to increase understanding of non-urban tissue concentrations of the human health COCs.
- 5.2** Respondents shall compile and assess data gathered in Puget Sound since the dataset used for the ROD was established. Respondents shall recommend additional Puget Sound seafood sampling that may be necessary to establish statistically supported non-urban background levels for human health COCs in LDW relevant fish and shellfish species.
- 5.3** The data compilation and assessment, including any recommendations for additional Puget Sound seafood sampling, shall be presented in a technical report.

6. DELIVERABLES

- 6.1 Applicability.** Respondents shall submit deliverables for EPA comment or approval or comment as specified in this Section. Copies of deliverables shall be provided, as directed by EPA, to Ecology, the Muckleshoot Tribe, and the Suquamish Tribe to ensure a reasonable opportunity for review and comment. As requested by EPA, Respondents shall provide additional hard copies for use in Community Involvement, including the LDW Roundtable.
- 6.2 Technical Specifications**
- (a) LDWG shall submit electronic data in accordance with the Region 10 Data Management Plan (May 2014) and associated guidance and templates. Respondents shall submit sampling and monitoring data in Region 10 Electronic Data Deliverable (EDD) format. Respondents shall upload the data into EPA's SCRIBE and into Ecology's EIM database. Respondents shall provide EPA with a copy of the files created to load data into the EPA database.
- (b) Spatial data, including spatially-referenced data and geospatial data, shall be submitted following the procedures in the "U.S. EPA Region 10 Geographic Information Systems (GIS) for External Entities"; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If

applicable, submissions should include the collection method(s). The GIS data must be submitted to EPA on disc at the same time as the final reports are submitted. If requested by EPA, LDWG shall provide GIS data used in sampling plans, QAPPs, reports, or other submittals where GIS and mapping programs were used to generate maps, diagrams, and other visual aids. Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at <https://edg.epa.gov/EME/>.

- (c) Each file must include an attribute name for each site unit or sub-unit submitted. Consult <https://www.epa.gov/geospatial/geospatial-policies-and-standards> for any further available guidance on attribute identification and naming.
- (d) Spatial data submitted by Respondents does not, and is not intended to, define the boundaries of the Site.

6.3 Remedial Design Work Plan. Respondents shall submit a Remedial Design (RD) Work Plan (RDWP) for EPA approval. The RDWP shall include a proposed plan and schedule for implementing all RD activities for the LDW Middle Reach and identification and development of all RD supporting documents. The RDWP must include:

- (a) A description of the overall management strategy for performing the RD.
- (b) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring in the LDW Middle Reach;
- (c) A description of the responsibility and authority of all organizations and key personnel involved with the development of the RD;
- (d) A discussion of additional challenges, data needs, investigations or retesting necessary to initiate or complete the remedial design (e.g., how to characterize and remediate areas with structural or access restrictions);
- (e) A Pre-Design Investigations (PDI) Work Plan, as specified in Section 6.4.
- (f) Descriptions of any applicable permitting requirements and other regulatory requirements (including but not limited to Applicable or Relevant and Appropriate Requirements (ARARs) identified in the ROD);

- (g) Description of plans for obtaining access in connection with RD and RA, such as property acquisition, property leases, and/or easements, and for developing institutional controls in accordance with the ROD;
- (h) Proposed approach to reporting data from Pre-Design Investigation (PDI);
- (i) Discussion of existing data (e.g., upstream suspended solids data, source control storm drain solids data, flow and other hydrodynamic data, pre-design data, and EAA monitoring data) and data to be collected as part of design or following construction that will assist in anticipating the quality of surface sediments over time. This discussion shall include a conceptual site model (CSM) that considers suspended and bedded sediments, including dredge residuals, and how they move during and after construction, to aid in interpreting monitoring outcomes in the Middle Reach; and
- (j) A comprehensive listing and brief description of elements of remedial design to be addressed or supporting deliverables to be submitted as part of remedial design, including but not limited to those listed below or described in ¶ 6.10 (Components of Remedial Design Reports).
 - (1) QAPPs and health and safety plan [HSP].
 - (2) Remedial action basis of design report, including.
 - (i) Narrative basis of design of dredge, cap, ENR, and MNR>SCO elements, including supporting technical evaluations.
 - (ii) Permitting and site access.
 - (iii) Construction sequence, scheduling and cost estimate.
 - (iv) Anticipated long-term monitoring and maintenance approaches, including any expected measures for climate change adaptation.
 - (v) Evaluation of institutional controls requirements for caps
 - (vi) Archaeological monitoring and discovery.
 - (vii) Transportation and disposal approaches.
 - (viii) Scheduling and coordination of work under this SOW with other in-water work or navigation or development projects on the bank and intertidal or subtidal areas, if they may substantively affect remedial design or construction in the LDW Middle Reach.
 - (ix) Green and sustainable remediation evaluation and implementation approach.

- (x) Approach to implementation and assurance of institutional controls.
- (xi) Geotechnical basis of design.
- (xii) Sediment excavation prism verification.
- (3) Water quality monitoring plan.
- (4) Biological assessment.
- (5) Construction quality assurance plan.

6.4 Pre-Design Investigation. The purpose of the PDI is to address data needs for completion of design, by conducting field investigations.

- (a) **PDI Work Plan.** Respondents shall submit a PDI Work Plan (PDIWP) per Section 6.4.b, for EPA approval. The PDIWP must include:
 - (1) An evaluation and summary of existing data and description of data gaps;
 - (2) A strategy for timely characterization, testing or data gathering to support delineation of areas where each remedial technology applies and engineering design, a discussion of the timing and type of data collection needed to document ARARs compliance, and a plan for natural recovery monitoring where required;
 - (3) A conceptual sampling plan including proposals and clearly stated rationales for any proposed tiering analyses or phasing of work to refine recovery categories, apply remedial technologies, including natural recovery, and design the remedy. The sampling plan shall identify media to be sampled, general location type and purpose, field sampling and lab analyses, bathymetric, hydrogeologic, and geotechnical studies; and
 - (4) A schedule for implementing the PDI work.
 - (5) A sampling design that uses the conceptual site model for the Middle Reach and multiple lines of conceptual and statistical evidence to identify RAL exceedance areas with a targeted level of accuracy and uncertainty. The specifics of sampling design will be in the QAPP and QAPP addendum.
 - (6) Phasing of sampling and tiering for chemical and physical analysis will be limited to no more than 2 phases with no more than 2 analytical tiers within a phase, unless further tiering or phasing does not affect the project schedule and is approved by EPA. The purpose of this is to ensure timely completion of the pre-design investigation to support future design.

- (7) Interpolation methods will be used in identifying RAL exceedance areas for design. Any interpolation model that is used for decisions, including additional sample placement shall be accompanied with an uncertainty analysis that summarizes the parameters selected for the model and the prediction accuracy and uncertainty of the model. A new uncertainty analysis shall be generated for each completed phase that incorporates new sample data.
 - (8) A minimum of 20% of the samples collected to ensure spatial coverage will be analyzed for dioxin/furans to ensure development of a complete dataset.
 - (9) The approach to be used to override existing data with new results shall be identified in the pre-design investigation work plan, including criteria for overriding subsurface data in limited cases (e.g., if the sampled location was later dredged), proximity requirements, and a process for evaluating discrepancies between existing and new data (e.g., magnitude of increase or decrease) that will be flagged for discussion and approval by EPA.
- (b) **PDI Quality Assurance Project Plan.** A QAPP addresses sample collection, analysis and data handling. The QAPP must include a field sampling plan, maps of sampling locations, and an explanation of Respondents' data quality objectives, quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. The QAPP shall address disposal of Investigation Derived Waste. Respondents shall submit a QAPP for each field sampling effort and shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005).
- (1) To ensure that Respondents' Labs perform all analyses using EPA-accepted methods (i.e., the methods documented in EPA Contract Laboratory Program (CLP) SOW for Inorganic Superfund Methods (ISM02.4, October, 2016); EPA CLP SOW for Organics Superfund Methods (SOM02.4, October, 2016); EPA CLP SOW for High Resolution Superfund Methods (HRSM01.2, October, 2014), or as updated; other methods acceptable to EPA;
 - (2) To ensure that Respondents' Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;
 - (3) To ensure that Respondents validate data in accordance with EPA-accepted data validation guidelines: National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA-540-R-2017-001,

January, 2017); National Functional Guidelines for Organic Superfund Methods Data Review (EPA-540-R-2017-002, January, 2017) National Functional Guidelines for High Resolution Superfund Methods Data Review (EPA-542-B-16-001, April, 2016) or as updated.

- (c) **PDI Health and Safety Plan(s).** A Health and Safety Plan (HASP) describes all activities to be performed to protect on site personnel and others transiting the area or living or working nearby from physical, chemical, and all other hazards posed by the Work. Respondents shall develop HASPs in accordance with EPA's Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. EPA does not approve the HASP, but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.
 - (d) **PDI Data.** Respondents shall submit data in accordance with the Schedule of Deliverables.
 - (e) **PDI Data Evaluation Reports Phase I and II.** This report shall include:
 - (1) Summary of the investigations performed;
 - (2) Summary of investigation results;
 - (3) Narrative interpretation of data and results, with supporting figures and tables, including updated graphics (similar to ROD Figure 18 or more detailed) of where specific remedial technologies and details of how the decision trees in the ROD (Figure 19 and corrected Figure 20) were applied;
 - (4) Results of statistical and modeling analyses, as applicable;
 - (5) Photographs documenting the work conducted; and
 - (6) Conclusions and recommendations for RD, including design parameters and criteria, and identification of any remaining data gaps needed to support the design.
- 6.5** Should additional data be needed to support the design, a QAPP addendum shall be submitted per the schedule in Section 7.
- 6.6 Preliminary (30%) RD.** Respondents shall submit a Preliminary (30%) RD for EPA's comment. The Preliminary RD must include the following elements and deliverables:
- (a) A basis of design report providing descriptions of the analyses conducted to select the design approach, including a summary and detailed justification of design

assumptions, restrictions and objectives to be used in design of the selected remedy; Essential supporting calculations shall be included (at least one sample calculation presented for each significant or unique design calculation, such as cap thickness or propeller wash modeling)

- (b) Preliminary plans and drawings, and a list of all drawings to be included in the intermediate, pre-final and final design;
 - (c) An outline of required specifications;
 - (d) Identification of candidate transloading location(s), transport methods, and permitted upland off-site landfill facility, and import material sources
 - (e) A schedule, contracting strategy, contractor requirements, any needed controls and monitoring to comply with ARARs and minimize impacts (in accordance with Section 13.2.5 and Section 13.2.8 of the ROD), and plans to manage potential conflicts with other in-water work, treaty-protected uses, navigation, recreation and commerce, and upland developments and land use changes that may affect remedial design and construction in the Middle Reach;
 - (f) Access and easement requirements.
 - (g) Descriptions of how compliance with ARARs will be achieved and documented, specifying documentation requirements associated with ARARs identified in Table 26 (such as a Biological Assessment, Compensatory Mitigation Plan if needed, Archaeological Discovery plan);
 - (h) An outline and description of Long Term Maintenance, and Monitoring Plan (LTMMP) elements for the Middle Reach;
 - (i) An outline of an Institutional Controls Implementation and Assurance Plan (ICIAP), including an evaluation of the most appropriate institutional, proprietary controls and location-specific use restrictions needed to ensure long-term effectiveness, consistent with ROD Section 13.2.4 (This ICIAP is distinct from plans developed under Section 2 of this SOW).
- 6.7 Intermediate (60%) RD.** Respondents shall submit the Intermediate (60%) RD for EPA's comment. The Intermediate RD must: (a) be a continuation and expansion of the Preliminary RD; (b) address EPA's comments regarding the Preliminary RD; and (c) include the elements and deliverables required for the Preliminary (30%) RD at a 60% level of completion.
- 6.8 Pre-Final (90%) RD.** Respondents shall submit the Pre-final (90%) RD for EPA's comment. The Pre-final RD must be a continuation and expansion of the previous design submittal and must address EPA's comments regarding the Intermediate RD.

The Pre-final RD will serve as the approved Final (100%) RD if EPA approves the Pre-final RD without comments. The Pre-final RD must include:

- (a) A complete set of construction drawings and specifications that are: (1) certified by a registered Professional Engineer; (2) suitable for procurement; and (3) follow the Construction Specifications Institute's MasterFormat (or equivalent) and meet other relevant standards for design of sediment cleanup;
- (b) A survey and engineering drawings showing existing features in the LDW Middle Reach, such as property boundaries, easements, bathymetry, structures to be protected or removed, and other relevant conditions;
- (c) A specification for all necessary construction documentation, including but not limited to photographs and videos, bathymetric surveys, and GPS coordinates); and
- (d) Those elements listed for the Preliminary Design, as well as the following (unless previously approved by the EPA):
- (e) Draft Construction Quality Assurance Plan (CQAP).
- (f) Draft Water Quality Monitoring Plan.
- (g) Draft QAPP/HSP for remedial action construction and monitoring activities.
- (h) Draft Permitting and Site Access Plan.
- (i) Outline of ICIAP, including specific IC elements for each affected area.
- (j) Required elements of a vessel management plan (to be finalized by contractor)
- (k) Annotated outline and conceptual description of LTMMP elements specific to the Middle Reach, discussing how the elements and schedule fit into a likely LTMMP approach for the LDW site as a whole.
- (l) Habitat Area Identification. For the purpose of complying with Endangered Species Act and Section 404 of the Clean Water Act (CWA) (see Table 26 of the ROD), Respondents shall identify habitat areas and proposed elevations and substrate materials for caps, ENR, or placement of backfill materials in any identified habitat areas and shall identify any areas where loss of aquatic habitat is unavoidable.
- (m) Draft Biological Assessment.
- (n) Draft CWA 404 and Section 10 Rivers and Harbors Act of 1899 memorandum
- (o) Engineer's Capital and Operation and Maintenance Cost Estimate.

- (p) Engineer's Construction Project Schedule.
- (q) Community Outreach and Communications Plan
- (r) Any additional plans identified in the Remedial Design Work Plan.

6.9 Final (100%) RD. Respondents shall submit the Final (100%) RD for EPA approval. The Final RD must address EPA's comments on the Pre-final RD and must include final versions of all Pre-final RD elements and deliverables. The ICIAP and LTMMP will remain as annotated outlines in the Final RD.

6.10 Components of Remedial Design Reports. Respondents shall submit each of the following supporting deliverables for EPA approval with each Remedial Design submittal, except as specified in Sections 6.6, 6.7, and 6.8 above. Respondents shall develop the deliverables in accordance with all applicable regulations, guidance, and policies (see Section 8 (References)). Respondents shall update and refine supporting deliverables related to design in accordance with the degree of design completion (30/60/90/100%) or as directed by EPA.

- (a) **LDW Middle Reach Water Quality Monitoring Plan.** The purpose of the LDW Middle Reach Water Quality Monitoring Plan (WQMP) is to obtain information during construction to identify water quality impacts that may be caused by remedy construction; The WQMP must include:
 - (1) Description of the data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;
 - (2) Description of how performance data will be analyzed, interpreted, and reported, and/or other Site-related requirements;
 - (3) Description of the communications and response protocols to respond to detected exceedances of water quality parameters as defined in the EPA 401 memo;
 - (4) Description of deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, data reports and data evaluation reports to EPA; and
 - (5) Description of additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) that would be triggered in the event that monitoring results indicate higher than expected concentrations of TSS or the contaminants of concern in surface water.

- (b) **Construction Quality Assurance Plan.** The purpose of the CQAP is to describe planned and systemic activities that provide confidence that the RA construction will satisfy all plans, specifications, and related requirements, including quality objectives. In addition, the purpose is to describe the activities to verify that RA construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQAP must:
- (1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQAP;
 - (2) Describe the requirements to be met to achieve completion of the LDW Middle Reach RA;
 - (3) Describe the key performance standards and quality control elements required of the Contractor in the technical specifications;
 - (4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQAP
 - (5) Describe procedures for tracking construction deficiencies from identification through corrective action;
 - (6) Describe procedures for documenting all CQAP activities; and
 - (7) Describe procedures for retention of documents and for final storage of documents.
- (c) **Emergency Response Plan.** Specifications for an Emergency Response Plan (ERP) shall be submitted as part of the 30/60/90 and 100% design submittal to address requirements for clear procedures in the event of an accident or emergency during remedial construction (for example, vessel or equipment damage, failure or power outages, unauthorized discharges to water, water impoundment failure, bank slope failure, etc.). The ERP may be updated in future as part of the remedial action work plan (RAWP). Specifications for the ERP shall address:
- (1) Name of the person or entity responsible for responding in the event of an emergency incident;
 - (2) Plans for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;
 - (3) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), consistent with the regulations under 40 C.F.R. Part 112, describing measures to prevent, and contingency plans for, spills and discharges;

- (4) Notification activities in the event of a release of hazardous substances requiring reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004; and
 - (5) A description of all necessary actions in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.
- (d) **Community Outreach and Communications Plan (COCP).** The COCP shall describe actions being taken to minimize the potential impacts including safety issues of remedy implementation on the community (e.g. residents, businesses, fishers, commuters, waterway users) and a plan for communicating with and responding to the community. Safety and other community concerns about construction will also be discussed with the Round Table during RD.
 - (e) **Archeological Discovery Plan.** For the purpose of complying with historical and archaeological preservation requirements, Respondents shall document any districts, sites, buildings, structures or objects included or eligible for inclusion in the National Register of Historic Places potentially impacted by remedy implementation and shall include specifications for an archaeological discovery plan to ensure protection of Native American artifacts and cultural or archaeological resources.
 - (f) **Biological Assessment.** With the 90% RD, Respondents shall submit a biological assessment for EPA review and use in consultation related to the Endangered Species Act.
 - (g) **Compensatory Mitigation Plan.** If necessary to comply with Clean Water Act Section 404 requirements, Respondents shall submit a plan for compensatory mitigation.
 - (h) **Section 408 Compliance Documentation.** Respondents shall include documentation necessary to evaluate compliance with 33 U.S.C. Section 403 and Section 408.

7. SCHEDULE

- 7.1 Applicability and Revisions.** All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Schedule of Deliverables set forth below. Deliverables not identified below shall be due in accordance existing requirements (progress reports), an EPA approved schedule proposed by Respondents or as directed by EPA. Respondents may propose changes to the Schedule of Deliverable for EPA approval. Upon

EPA's approval, the revised schedule supersedes the schedule set forth below and previously-approved schedules.

- 7.2 General.** Unless otherwise approved by EPA, submittal revisions following initial EPA comments shall be due 30 days from receipt of the comments. Subsequent revisions shall be due 14 days or as directed in EPA comments on the prior revision.

Schedule of Deliverables – Fifth Amendment of RI/FS AOC

Item	Deliverable, Task	SOW or (AOC) reference	Deadline
1	Notification of contractor/sub-contractor selection	(RI/FS AOC VIII, 1)	180 days from Amendment #5 effective date
2	RDWP	6.3	135 days from Issuance of Notice to Proceed to Contractor
3	PDIWP	6.4a	same as #2 above
4	PDI QAPP/HSP	6.4b/c	same as #2 above
5	Completion of PDI field work	6.4a	In accordance with the schedule in the approved PDIWP, unless otherwise approved by EPA.
6	Phase 1 PDI Data Submittal	6.4d	10 days after Respondents' receipt of validated PDI sampling data from Tier 1, or from Tier 2 if there are two or more tiers of analysis.
7	PDI Phase 1 Data Evaluation Report and Phase II QAPP Addendum	6.4b/e	80 days after Respondents' submittal of the PDI data for Phase 1 data collection to EPA.
	Phase II PDI Data Submittal	6.4e	10 days after Respondents' receipt of validated PDI sampling data from Tier 1, or from Tier 2 if there are two or more tiers of analysis
8	PDI Phase II Data Evaluation Report	6.4e	60 days after Respondents' submittal of PDI Phase II data to EPA.
9	Preliminary (30%) RD submittal	6.6	45 days from EPA approval of PDI Phase II Data Evaluation Report.
10	Intermediate (60%) RD Submittal	6.7	120 days after EPA comments on Preliminary RD.
11	Pre-final (90%) RD Submittal	6.8	90 days after EPA comments on Intermediate RD.
12	Final (100%) RD	6.9	60 days after EPA comments on Pre-final RD.
13	Periodic Monitoring QAPP Addendum for clam tissue	4	For clams: concurrent with plans for 2023 fish and crab sampling required under AOC Amendment #4.

14	Periodic Monitoring Data Evaluation Report	4	For clams, included with or concurrent with reporting of fish and crab sampling required under AOC Amendment #4.
15	Fish and Shellfish Background Compilation Report	5	15 months from Amendment #5 effective date.

8. REFERENCES

8.1 The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the two EPA Web pages listed in ¶ 8.2:

- (a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).
- (b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).
- (c) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).
- (d) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G-90/001 (Apr. 1990).
- (e) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).
- (f) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).
- (g) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).
- (h) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. Part 300 (Oct. 1994).
- (i) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).

- (j) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).
- (k) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).
- (l) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).
- (m) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).
- (n) Quality management systems for environmental information and technology programs -- Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).
- (o) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005).
- (p) USEPA Office of Solid Waste and Emergency Response. Geospatial Superfund Site Data Definition and Recommended Practices Memo. OLEM Directive 9200.2-191. (November 29, 2017)
- (q) Principles for Greener Cleanups (Aug. 2009), <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>.
- (r) Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, EPA-540-R-05-012 Office of Solid Waste and Emergency Response OSWER 9355.0-85 December 2005
- (s) Guidance for In Situ Subaqueous Capping of Contaminated Sediments, USACE 2012
- (t) Contaminated Sediments Remediation: Remedy Selection for Contaminated Sediments, ITRC 2014
- (u) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM02.4 (October 2016).
- (v) USEPA Contract Laboratory Program Statement of Work for Organic Superfund Methods (Multi-Media, Multi-Concentration), ISM02.4 (October 2016).
- (w) EPA CLP SOW for High Resolution Superfund Methods (HRSM01.2, October, 2014)

- (x) National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA-540-R-2017-001, January, 2017)
- (y) National Functional Guidelines for Organic Superfund Methods Data Review (EPA-540-R-2017-002, January, 2017)
- (z) National Functional Guidelines for High Resolution Superfund Methods Data Review (EPA-542-B-16-001, April, 2016)
- (aa) Recommended Evaluation of Institutional Controls: Supplement to the “Comprehensive Five-Year Review Guidance,” OSWER 9355.7-18 (Sep. 2011).
- (bb) Construction Specifications Institute’s MasterFormat 2012, available from the Construction Specifications Institute, <http://www.csinet.org/masterformat>.
- (cc) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012).
- (dd) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012).
- (ee) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), <https://www.epa.gov/superfund/superfund-post-construction-completion>.
- (ff) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003. Mar. 2001, reissued May 2006.

8.2 A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance <https://www.epa.gov/superfund/superfund-policy-guidance-and-laws>

Test Methods Collections <https://www.epa.gov/measurements/collection-methods>

For any regulation or guidance referenced in the RI/FS AOC or Amendment #5 the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10

IN THE MATTER OF:	)	
	)	U.S. EPA Region 10
	)	CERCLA Docket No. 10-2001-0055
Lower Duwamish Waterway	)	
Seattle, WA	)	
	)	
Port of Seattle, City of Seattle,	)	
King County, The Boeing Company	)	
	)	
Respondents	)	
	)	
Proceeding Under Sections 104, 122(a)	)	SIXTH AMENDMENT
and 122(d)(3) of the Comprehensive	)	
Environmental Response, Compensation,	)	
and Liability Act, 42 U.S.C. §§ 9604,	)	
9622(a) and 122(d)(3)	)	
	)	

Introduction

In December 2000, the City of Seattle, King County, the Port of Seattle, and the Boeing Company (“Respondents”) entered into an *Administrative Order on Consent for Remedial Investigation/Feasibility Study*, U.S. EPA, Region 10 Docket No. CERCLA 10-2001-0055, Ecology Docket No 00TCPNR-1895 (12/20/2000) (the “RI/FS AOC”) with the United States Environmental Protection Agency (“EPA”) and the Washington State Department of Ecology (“Ecology”). Respondents performed a remedial investigation and feasibility study for the Lower Duwamish Waterway Superfund Site (“Site” or “LDW”) under the oversight of EPA and Ecology pursuant to the RI/FS AOC. The RI/FS AOC has been amended five times to provide for the performance of additional studies related to the Site. The First Amendment, effective March 19, 2013, provided for the performance of the Fisher Study for the LDW. The Second Amendment, effective July 17, 2014, provided for the performance of the Enhanced Natural Recovery (ENR)/Activated Carbon (AC) pilot study. The Third Amendment, effective April 27, 2016, provided for the performance of pre-remedial design studies. The Fourth Amendment, effective July 9, 2018, provides for remedial design (RD) of the LDW Upper Reach. The Fifth Amendment, effective July 8, 2021, provides for RD of the LDW Middle Reach. The Respondents continue to perform these studies pursuant to the terms of the amended RI/FS AOC.

The EPA issued a Record of Decision for the Site on November 21, 2014 (the “Lower Duwamish Waterway ROD”). The Lower Duwamish Waterway ROD selected remedial actions for the in-waterway portion of the Site.

Source control is an integral part of the strategy for addressing contamination throughout the Site. An objective of the source control endeavor is to find and sufficiently control sources upland of the waterway before commencing in-waterway remediation. Ecology is the lead agency for implementing source control actions and uses its existing regulatory authorities to control sources. For purposes of assessing adequacy of source control in the immediate source area to the LDW, Ecology has divided the LDW into three reaches: upper, middle, and lower. Consistent with Sections 4.2 and 13.2.7 of the LDW ROD, EPA intends to commence remedial action for the LDW Site or a segment thereof after a source control determination for the LDW Site or segment thereof is made.

The objective of this Sixth Amendment is to terminate the amended RI/FS AOC.

Sixth Amendment

EPA, Ecology, and Respondents agree to amend and terminate the amended RI/FS AOC as follows:

1. With the exception of XVII (Record Preservation), Section XVIII (Dispute Resolution), Section XXII (Payment of EPA Oversight Costs) and Section XXIV (Other Claims) of the amended RI/FS AOC, the amended RI/FS AOC shall, despite the terms of Section XXVII (Termination and Satisfaction) of the amended RI/FS AOC, terminate on the date a consent decree that provides for implementation of remaining remedial design and remedial action for the LDW Site (RD/RA Consent Decree) is entered by the United States District Court for the Western District of Washington (hereafter the Effective Date). Under Section XXI.4 of the amended RI/FS AOC, the requirements of the amended RI/FS AOC will have been satisfied with respect to work performed up to the Effective Date and all remaining amended RI/FS AOC obligations to perform work will be subsumed into the RD/RA Consent Decree.
2. Section XVIII (Dispute Resolution), Section XXII (Payment of EPA Oversight Costs), and Section XXIV (Other Claims) of the amended RI/FS AOC shall terminate on the date Respondents pay EPA for all oversight costs that are incurred by EPA pursuant to the amended RI/FS AOC from October 1, 2022 up to the Effective Date. Payment of the oversight costs EPA incurs during this period shall be made pursuant to the terms of Section XXII (Payment of EPA Oversight Costs).
3. Section XXI (Reservation of Rights and Reimbursement of Costs) and Section XXIV (Other Claims) shall remain in effect after the Effective Date only for Respondents that do not sign the RD/RA Consent Decree.

4. The amounts paid by Respondents to the EPA Hazardous Superfund pursuant to this Sixth Amendment and the requirements of Section XXII (Payment of EPA Oversight Costs) of the amended RI/FS AOC shall be deposited by EPA into the Lower Duwamish Waterway Superfund Site Special Account pursuant to Section XXI (Reservations of Rights and Reimbursement of Costs) of the amended RI/FS AOC to be retained and used by EPA to conduct or finance response actions at or in connection with the Site. In addition, EPA has several other site-specific accounts related to the Site within the EPA Hazardous Superfund. Funds held in such site-specific accounts may be transferred to the Lower Duwamish Waterway Superfund Site Special Account if EPA determines that the funds are no longer needed to finance or otherwise support the implementation of response actions for which such site-specific account was created. After completion of response actions at or in connection with the Site, any funds remaining in the Lower Duwamish Waterway Site Specific Account may be transferred by EPA to the EPA Hazardous Substance Superfund.

It is so ORDERED AND AGREED this _____ day of _____, 2023.

By: **KIRA LYNCH**
 Kira Lynch
 Chief, Remedial Cleanup Branch Unit Manager,
 Superfund and Emergency Management Division
 Region 10
 United States Environmental Protection Agency

Digitally signed by KIRA
 LYNCH
 Date: 2024.02.01
 21:03:14 -08'00'

DATE: _____

By: **Kimberly Wooten**

 Kimberly Wooten
 Northwest Region Office
 Section Manager
 Toxics Cleanup Program
 Washington Department of Ecology

Digitally signed by
 Kimberly Wooten
 Date: 2024.01.30
 16:47:14 -08'00'

DATE: _____

Agreed this 2nd day of January, 2024
For Respondent Port of Seattle

By: Pete Ramels

Name: Pete Ramels

Title: General Counsel

Agreed this 12/20/2023
day of _____, 2023
For Respondent City of Seattle

By: 
Andrew Lee (Dec 20, 2023 16:23 PST)

Name: Andrew Lee

Title: General Manager / CEO

Agreed this 29 day of December,
2023 For Respondent King County

By: 

Name: Dow Constantine

Title: King County Executive

Agreed this 12 day of January, 2024
For Respondent The Boeing Company

By: 

Name: Thiess Lindsay

Title: Director of Remediation and Policy Risk