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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

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).
18

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.
24

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.
8

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.
19

20 3. No voluntary conveyance or relinquishment of title, easement, leasehold,
21 or other interest in any portion of the Site shall be consummated by Respondents without
22 provision for continued implementation of all requirements of this Order and implementation of
23 any remedial actions found to be necessary as a result of this Order. Prior to transfer of any legal
24 or equitable interest Respondents may have in the Site or any portions thereof, Respondents shall
25 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.
3

4 IV. STATEMENT OF PURPOSE

5
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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17
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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1 V. FINDINGS OF FACT

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

4
5 1. The Lower Duwamish Waterway Site (Site) consists of the areal extent of
6 contamination in the Lower Duwamish Waterway. It has served as Seattle's major industrial
7 corridor since it was first created by a widening and straightening of the Lower Duwamish River
8 (and formation of Harbor Island) by the United States Army Corps of Engineers, completed in
9 1911. Industrial uses of and along the Waterway have been extensive over nearly ninety years.
10 The Waterway is also habitat to numerous fish and other aquatic species, and is a migratory
11 corridor for endangered, threatened, and other anadromous fish.

12
13 2. Contaminants found in the waterway include, but are not limited to,
14 polychlorinated biphenyls (PCBs), poly-aromatic hydrocarbons (PAHs), mercury and other
15 metals, and phthalates. The Lower Duwamish Waterway has been the subject of numerous
16 studies by various governmental and private entities which Respondents have agreed to
17 assemble, integrate and evaluate during Phase I of the RI process, as set forth in the attached
18 SOW. Many contaminant releases may have pre-dated the 1970s. Sources of releases include
19 industrial releases, sewer system outfalls and urban run-off from Respondents' facilities.
20

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

23
24 4. The Port of Seattle, is a Washington Port District, duly created under
25 RCW Chap. 53. King County is the most populous county in the state of Washington. The City
26 of Seattle is the most populous municipality in the state of Washington. The Boeing Company is
27 a Delaware Corporation doing business in the state of Washington, primarily engaged in aircraft
28

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.

5
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.

8
9 VI. CONCLUSIONS OF LAW AND DETERMINATIONS

10 EPA and Ecology make the following conclusions of Law and Determinations
11 which Respondents neither admit or deny:

12
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).

15 2. Wastes and constituents thereof at the Site, as identified in the preceding
16 Section are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. §
17 9601(14), and in RCW 70.105D.020(7), or constitute "any pollutant or contaminant" that may
18 present an imminent and substantial danger to public health or welfare under Section 104(a)(1) of
19 CERCLA, 42 U.S.C. § 9604(a)(1).

20
21 3. The presence of hazardous substances at the Site or the past, present, or
22 potential migration of hazardous substances currently located at or emanating from the Site,
23 constitute actual and/or threatened "releases" as defined in Section 101(22) of CERCLA, 42
24 U.S.C. § 9601(22), and RCW 70.105D.020(20).

25
26 4. Each Respondent is a "person" as defined in Section 101(21) of CERCLA,
27 42 U.S.C. § 9601(21), and RCW 70.105D.020(14).

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.
5

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.
12

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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22 VIII. WORK TO BE PERFORMED

23
24 1. For purposes of this Order, an RI/FS also means a Cleanup Study Plan
25 under Chapter 173-204 WAC. All work performed under this Consent Order shall be under the
26 direction and supervision of qualified personnel. Within thirty (30) days of the effective date of
27 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.
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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.

26
27 B. Scoping For Phase II RI. EPA and Ecology determine the Site-

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:

5
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.
12

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.
21

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.
28

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 othertime 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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19
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.
21

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.
8

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.
20

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.
11

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:
17

18 1. Memorandum on Remedial Action Objectives.

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

25 I. Detailed Analysis of Alternatives. Respondents shall conduct a detailed
26 analysis of remedial alternatives, as described in the FS Work Plan. During the detailed analysis
27

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.

7
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.

15
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.

19
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.

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.
9

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.
13

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.
20

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.
7

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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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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26 XI. QUALITY ASSURANCE

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.
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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.
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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.
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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.

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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.
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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.

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.

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XVI. OTHER APPLICABLE LAWS

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

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XVII. RECORD PRESERVATION

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1. All records and documents in Respondents' possession that concern the

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

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

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5 XIX. DELAY IN PERFORMANCE, EPA STIPULATED PENALTIES, ENFORCEMENT

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

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

25 3. Respondents shall make all payments by forwarding a check, made
26 payable to the Hazardous Substance Superfund, to: Mellon Bank, EPA Region 10-
27 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.

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

9) Comparative analysis report.

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

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

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

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

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

(a) The Attorney General may bring an action to enforce this Order in a

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.

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16 XX. FORCE MAJEURE

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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.

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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.

1 XXIV. OTHER CLAIMS

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

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

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16
17 XXV. FINANCIAL ASSURANCE, INSURANCE, AND INDEMNIFICATION

18 1. Respondents shall separately establish and maintain a financial instrument
19 or trust account or other financial mechanism acceptable to EPA and Ecology, including a
20 demonstration that one or more of the Respondents satisfy the requirements of 40 C.F.R. Part
21 264.143(f), sufficient to assure the work and any other obligations required under this Consent
22 Order, including a margin for cost overruns. Within fifteen (15) days after the effective date of
23 this Consent Order, Respondents shall fund the financial instrument or trust account sufficiently
24 to perform the work required under this Consent Order projected for the period beginning with
25 the effective date of the Order through 2002. Beginning January 1, 2003, and on or before the
26 15th calendar day of each calendar year quarter thereafter, Respondents shall fund the financial
27 instrument or trust account sufficiently to perform the work and other activities required under
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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
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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
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Ecology and EPA that the Order or proposed changes to it are inadequate or improper in any respect.

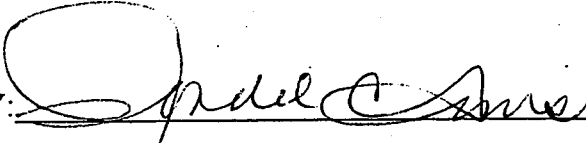
Respondent Port of Seattle:

BY: *M.R. Dinsmore* DATE: 4-19-2000

M.R. Dinsmore, Executive Director

Respondent King County:

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BY:  DATE: 4-19-08

Ron Sims, King County Executive

Respondent City of Seattle:

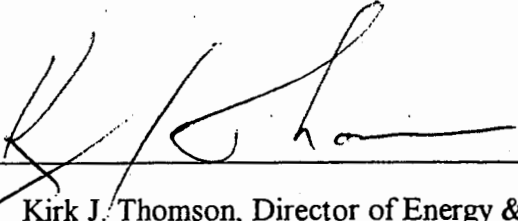
BY: Paul Schell

DATE: 4/19/00

Paul Schell, Mayor

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Respondent The Boeing Company:

BY:  DATE: 4-19-00

Kirk J. Thomson, Director of Energy & Environmental Affairs

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

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

State of Washington, Department of Ecology, Toxics Cleanup Program

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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

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

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 ERA 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.

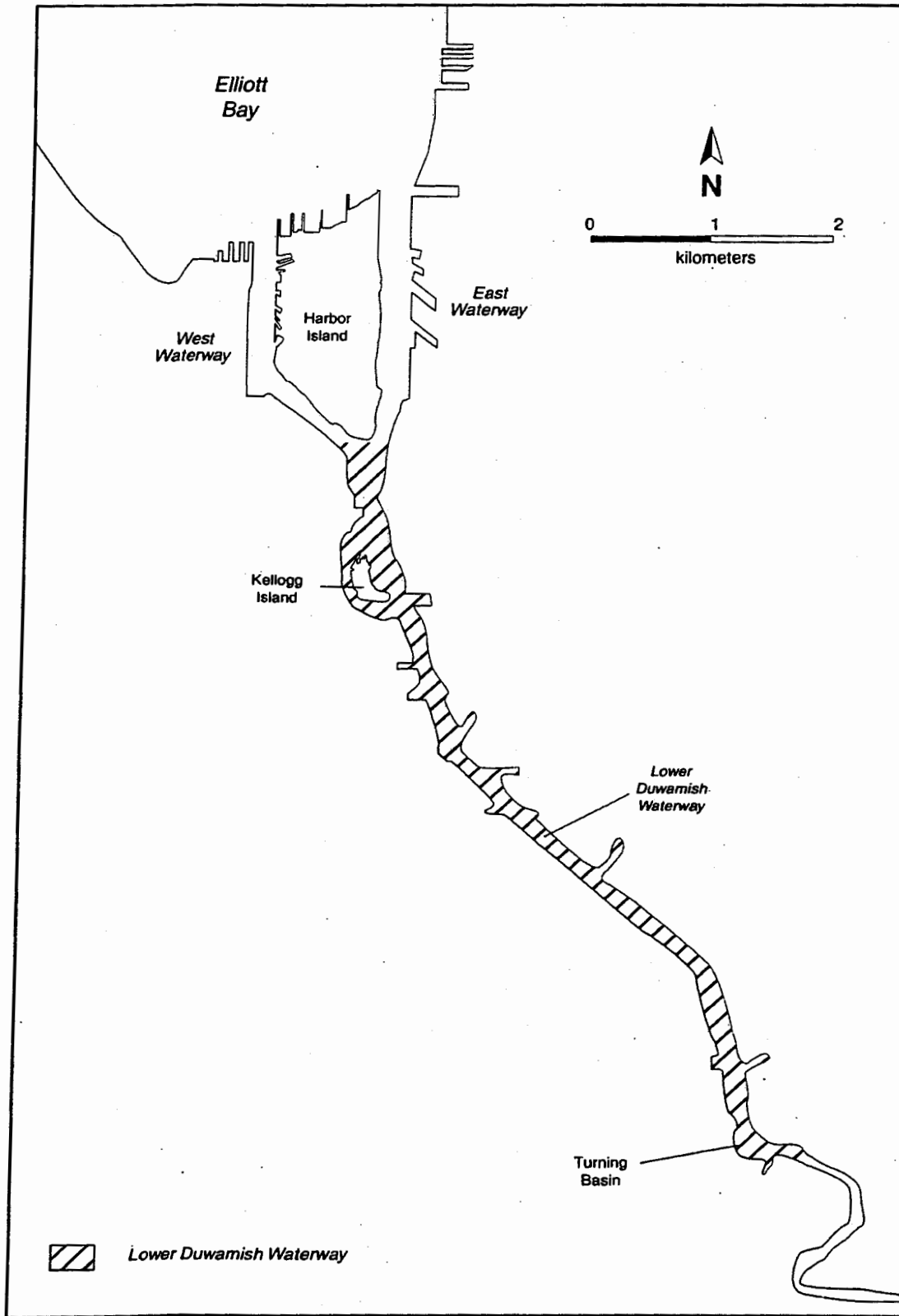


Figure 1. Lower Duwamish Waterway (LDW)

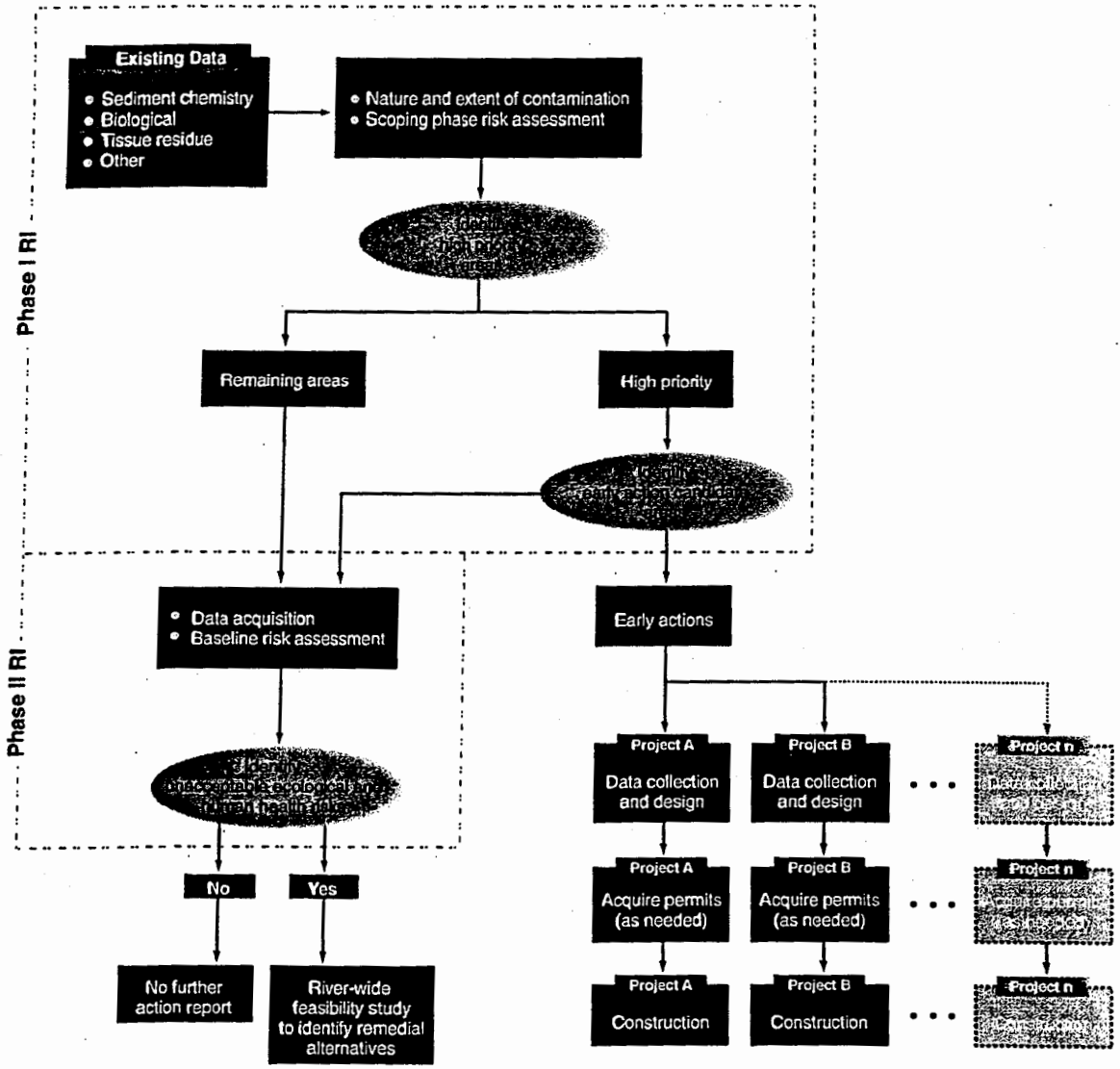


Figure 2. Flowchart of tasks for the Lower Duwamish Waterway RI/FS

Lower Duwamish Waterway Remedial Investigation Phase I Timeline

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Months from Project Inception

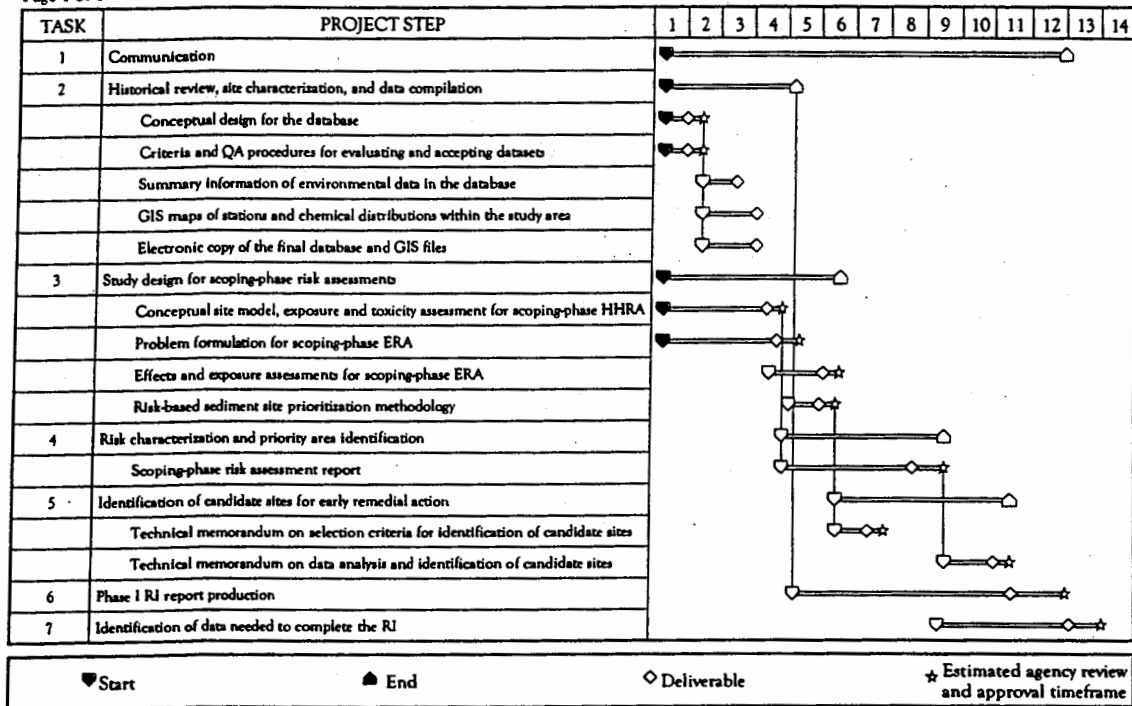


Figure 3. Anticipated schedule for the Lower Duwamish Waterway Phase I RI
[timeline edited and reinserted]

Table 1. Remedial Investigation objectives

Phase I	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 PLAN

Draft and final river-wide FS work plan

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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**