UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 10

IN THE MATTER OF:	)	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMOVAL ACTION
	)	
GASCO Sediments Site within Portland Harbor Superfund Site Portland, Multnomah County, Oregon	)	U.S. EPA Region 10 CERCLA Docket No. 10-2009-0255
	)	
NW Natural, an Oregon Corporation, and Siltronic Corporation, a Delaware Corporation	)	Proceeding Under Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622
Respondents.	)	
_____	)	

TABLE OF CONTENTS

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent (Settlement Agreement) is entered into voluntarily by the United States Environmental Protection Agency, Region 10 (EPA), NW Natural and Siltronic Corporation (Respondents). This Settlement Agreement provides for the performance of a response action investigation and design activities by Respondents and the payment of response costs incurred by the United States and Tribal Governments at or in connection with an area known as the GASCO Sediments Site within the boundaries of the Portland Harbor Superfund Site in Portland, Oregon. The response action is more fully described in the Statement of Work ("SOW"), Appendix A hereto, and consists of a final sediment remedial investigation, Engineering Evaluation/Cost Analysis (EE/CA) and design for the Gasco Sediments Site.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended (CERCLA).

3. EPA has notified the State of Oregon Department of Environmental Quality (DEQ) of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

4. EPA and Respondents recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondents in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondents do not admit, and retain the right to controvert in any subsequent

proceedings, other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of fact, conclusions of law, and determinations in Sections IV and V of this Settlement Agreement. Respondents agree: (1) to undertake all Work required by this Settlement Agreement and comply with and be bound by the terms of this Settlement Agreement, subject to the dispute resolution process, and; (2) further agree that they will not contest EPA's authority to issue or enforce this Settlement Agreement, or the basis or validity of this Settlement Agreement or its terms.

5. EPA has entered into a Memorandum of Understanding for the Portland Harbor Site (the "MOU") with, among others, the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Grand Ronde Community of Oregon, the Confederated Tribes of Siletz Indians, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Nez Perce Tribe (collectively, "the Tribal Governments") to acknowledge the federal government's consultation requirements concerning the Portland Harbor Superfund Site, and to ensure the Tribal Governments' participation in the response actions at the Portland Harbor Superfund Site, including early actions.

6. The Tribal Governments have treaty-reserved rights and resources and other rights, interests, or resources in the Site. The National Oceanic and Atmospheric Administration, the United States Department of the Interior, the Oregon Department of Fish & Wildlife, and the Tribal Governments are designated Natural Resource Trustees overseeing the assessment of natural resource damages at the Site. To the extent practicable, and if consistent with the objectives of the removal action, the work under this Settlement Agreement will be conducted so as to be coordinated with any natural

resource damage assessment and restoration of the Portland Harbor Superfund Site. The Tribal Governments and the federal and state Natural Resource Trustees will be provided an opportunity to review and comment on plans, reports, and other deliverables submitted by Respondents to EPA under this Settlement Agreement.

7. EPA and DEQ have agreed to share responsibility for investigation and cleanup of the Portland Harbor Superfund Site. DEQ is the lead agency for conducting upland work necessary for source control, and EPA is the support agency for that work. EPA is lead agency for conducting in-water work, including coordination of EPA's lead work with DEQ's source identification and source control activities. DEQ is the support agency for EPA's in-water work. DEQ will be provided an opportunity to review and comment on plans, reports, and other deliverables that Respondents submit to EPA under this Settlement Agreement. EPA will determine when sources have been controlled sufficiently for response action(s) to be implemented.

8. To the extent practicable and consistent with the objectives of this removal action, the work under this Settlement Agreement will be coordinated with work implemented under the Administrative Settlement Agreement on Consent for Remedial Investigation and Feasibility Study of the Site, dated September 29, 2001, Docket No. CERCLA-10-2001-0240 and DEQ-led uplands source control actions.

II. PARTIES BOUND

9. This Settlement Agreement applies to and is binding upon EPA and upon Respondents and their successors and assigns. Any change in ownership or corporate status of either Respondent including, but not limited to, any transfer of assets or real or personal property, shall not alter such Respondent's responsibilities under this Settlement Agreement.

10. Respondents are jointly and severally liable for carrying out all activities required by this Settlement Agreement. In the event of the insolvency or other failure of any one or more Respondents to implement the requirements of this Settlement Agreement, the remaining Respondent shall complete all such requirements.

11. Respondents shall ensure that their contractors, subcontractors, and representatives receive a copy of this Settlement Agreement prior to performing any work on the project, and that they comply with this Settlement Agreement. Respondents shall be responsible for any noncompliance with this Settlement Agreement.

III. DEFINITIONS

12. Unless otherwise expressly provided herein, terms used in this Settlement Agreement which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq*.

b. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.

c. "DEQ" or "State" shall mean the State of Oregon Department of Environmental Quality and any successor departments or agencies thereof.

d. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXX.

e. "Engineering Evaluation/Cost Analysis" (EE/CA) shall have the definition and attributes described in the NCP, as may be modified by this Settlement Agreement.

f. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

g. "EPA Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in negotiating, reviewing, implementing, and enforcing this Settlement Agreement. EPA Future Response Costs, include, but are not limited to, scoping, planning, developing and negotiating this Settlement Agreement prior to the Effective Date; and after the Effective Date, reviewing or developing plans, reports and other items pursuant to this Settlement Agreement; verifying the work; reviewing documents, attending meetings, and otherwise coordinating with DEQ on upland cleanup actions, including, but not limited to,

reviewing and commenting on upland source control documents; coordinating with DEQ, the Tribal Governments, and Natural Resource Trustees regarding the removal action; cooperative agreement or other interagency agreement costs related to the removal action; or otherwise implementing, overseeing, or enforcing this Settlement Agreement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, costs associated with EPA's preparation of any decision documents (including any Action Memoranda or EE/CA approval memo), the costs incurred pursuant to Paragraph 29 (costs and attorneys fees and any monies paid to secure access, including the amount of just compensation), Paragraph 39 (emergency response), and Paragraph 68 (work takeover), as well as any other enforcement activities undertaken by EPA or the U.S. Department of Justice related to this Settlement Agreement and removal action. EPA Future Response Costs shall not include the costs of oversight or data gathered by EPA concerning any other response action or Settlement Agreement associated with the Portland Harbor Superfund Site. EPA Future Response Costs shall not include monies incurred by any department, instrumentality, or agency of the United States that are not related to overseeing the Work, providing technical or legal support to EPA, or assessing human health and ecological issues related to the GASCO Sediments Site or this Settlement Agreement.

h. "GASCO Sediments Site" shall mean the area in the Willamette River on or adjacent to the former oil gasification plant, encompassing approximately 40 acres, located at 7200 NW Front Avenue and 7900 NW St. Helens Road in Portland, Multnomah County, Oregon. The GASCO Sediments Site includes sediment, surface water, and groundwater where Manufactured Gas Plant (MGP) wastes and volatile

organic compounds (VOC) are present in the Willamette River, as that area will be determined in accordance with the project area identification process described in the SOW.

i. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

j. "Institutional controls" shall mean non-engineered instruments, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use. Examples of institutional controls include easements and covenants, zoning restrictions, restricted navigation designations, and anchorage prohibitions.

j. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

k. "Settlement Agreement" shall mean this Administrative Settlement Agreement and Order on Consent and all appendices attached hereto (listed in Section XXIX). In the event of conflict between this Settlement Agreement and any appendix, this Settlement Agreement shall control.

l. "Paragraph" shall mean a portion of this Settlement Agreement identified by an Arabic numeral.

m. “Parties” shall mean EPA and Respondents.

n. “Portland Harbor Superfund Site” shall mean the site in Portland, Multnomah County, Oregon listed on the National Priorities List (NPL) on December 1, 2000. 65 Fed. Reg. 75179-01. The Portland Harbor Superfund Site consists of the areal extent of contamination, including all suitable areas in proximity to the contamination necessary for implementation of response action, at, from and to the Portland Harbor Superfund Site Assessment Area from approximately River Miles 2 to River Mile 12 (Assessment Area), including uplands portions of the Site that contain sources of contamination to the sediments at, on, or within the Willamette River. The boundaries of the Site will be initially determined upon issuance of a Record of Decision for the Portland Harbor Superfund Site.

o. “RCRA” shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq.* (also known as the Resource Conservation and Recovery Act).

p. “Section” shall mean a portion of this Settlement Agreement identified by a Roman numeral.

q. “Statement of Work” or “SOW” shall mean the statement of work for implementation of the removal action as set forth in Appendix A to this Settlement Agreement, and any modifications made thereto in accordance with this Settlement Agreement.

r. “Tribal Governments” shall mean the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Grand Ronde Community of Oregon, the Confederated Tribes of Siletz Indians, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation

of Oregon, and the Nez Perce Tribe. References to "Tribal Governments" in this Settlement Agreement may be a reference to an individual tribe, the tribes collectively, or some combination thereof.

s. "Tribal Response Costs" shall mean all direct and indirect costs that the Tribal Governments and their employees, agents, contractors, consultants and other authorized representatives incur in coordinating and consulting with EPA in conjunction with EPA's planning and implementation of this Settlement Agreement. Tribal Response costs are only those costs incurred to fulfill the requirements of this Settlement Agreement, including review of plans, reports, assessments and notes prepared pursuant to this Settlement Agreement; development of common positions and coordination among the Tribes; briefings to tribal leaders and tribal communities; and scoping, planning, and negotiating this Settlement Agreement and budgets. Such costs are not inconsistent with the NCP, 40 C.F.R. Part 300, are recoverable response costs pursuant to Sections 104 and 107 of CERCLA, 42 U.S.C. §§ 9604 and 9607 and are required to be paid by this Settlement Agreement.

t. "Waste Material" shall mean 1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); 2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); 3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and 4) any "hazardous substance" under ORS 465.200 *et seq.*

u. "Work" shall mean all activities Respondents are required to perform under this Settlement Agreement.

IV. FINDINGS OF FACT

13. EPA finds the following facts which Respondents neither admit nor deny:

a. Respondent, NW Natural is the assumed business name of Northwest Natural Gas Company, which in the past owned and operated the GASCO oil gasification plant and by-products refinery (GASCO facility). NW Natural currently owns a portion of the former GASCO facility, located at 7900 NW St. Helens Road in Portland, Oregon. The GASCO facility is located adjacent to the Willamette River, at approximately River Mile 6. NW Natural currently uses its property as a liquefied natural gas storage facility.

b. Portland Gas and Coke Company (GASCO) changed its name to Northwest Natural Gas Company in 1958. GASCO began to purchase property around 1910. Eventually, the GASCO facility was comprised of approximately 150 acres. GASCO built and operated an oil gasification plant and by-products refinery on the facility between 1913 and 1956. Between 1913 and 1923, only gas and lampblack briquettes were produced. In 1923 by-products refining began. After 1925, when tar refining operations began, the quantity of tar within the waste stream would have decreased, but waste tar in the effluent continued to occur as suspended material and emulsions from the secondary tar box. Prior to 1941, all wastewater effluent and tar stills from the gasification process and by-product refining were discharged to a stream channel leading from the production area to the Willamette River, or to low lying areas of the GASCO site. After 1941, wastewater effluent and tar stills were disposed of in settling ponds, some of which were located partly on property now owned by Siltronic. The plant shut down in 1956. During the life of the Gasco plant, it is reported that

approximately 70,000,000 barrels (2,940,000,000 gallons) of petroleum feedstock were processed. This process generated the following products and by-products: oil gas, lampblack, tar and light oil. From 1941 to 1956, the coke oven generated the following products and by-products: oil gas, coke, tar, and creosote oil. In addition to the preceding by-products, spent oxide (also called purifier box wastes) was generated from the use of iron oxide (iron-impregnated wood chips) or lime as solid reactants for the removal of impurities (e.g., sulfur and cyanide) from the oil gas. DEQ has estimated that when the plant closed in 1956, an estimated 30,000 cubic yards of tar waste had accumulated in the ponds. After NW Natural sold what is now the Siltronic property, the tar settling ponds were buried under at least 10 feet of fill following placement of dredge spoils and other materials on the site by the U.S. Army Corps of Engineers and others.

c. Through several site investigations widespread waste contamination related to the oil gasification and by-product refining has been identified, characterized, and delineated in site soils and groundwater, with contamination also present within Willamette River sediments. Tars have been identified to depths of 70 feet in the vicinity of the former tar settling ponds. In the former plant site area, non-aqueous-phase liquids (NAPLs) were identified at three distinct locations. Monitoring wells installed adjacent to the Willamette River detected elevated levels of benzene and naphthalene. Sediment samples were found to contain high concentrations of polycyclic aromatic hydrocarbons (PAHs) and oil tar waste, including a “tar body” was found to be in the river off of the GASCO river bank. A substantial portion of the tar body was removed in 2005 under a separate Administrative Order on Consent For Removal Action, CERCLA Docket No. 10-2004-0068.

d. When compared to probable effect concentration (PEC) guidelines for freshwater sediments, maximum contaminant concentrations in the former tar body and/or adjacent sediment were detected as follows: phenanthrene up to 5,400 mg/kg (parts per million), more than 1000 times the PEC; naphthalene up to 5,100 mg/kg, more than 1000 times the PEC, and total PAHs up to 26,409 mg/kg, more than 1000 times the PEC.

e. The GASCO site was divided in 1960 and the southern portion, comprising approximately 79.5 acres, was sold to Victor Rosenfeld and H.A. Andersen. An undivided one-third interest in that southern portion was conveyed to Gilbert Schnitzer in 1964. Those parties sold the property to the City of Portland, Portland Development Commission in two transactions, respectively in 1972 and 1978. In 1978, the City of Portland sold the property to Respondent Siltronic Corporation, then known as Wacker Siltronic Corporation.

f. The GASCO tar settling ponds, occupying an area of approximately 3 acres, were located on both the property currently owned by Siltronic and the property retained by NW Natural, and overflowed and drained into an 11-acre low-lying area extending from what is now the Siltronic property boundary to approximately 400 feet upstream. Additionally, an approximate 0.5-acre small apparent waste disposal area was located approximately 500 feet further south from the southern edge of the low-lying area. Further, during the operational history of the GASCO facility, lampblack and spent oxide waste piles were placed near the former gas manufacturing plant on the current western corner of the Siltronic property near the present property boundary with NW Natural, as well as adjacent to the Willamette River near the northern corner of the current NW Natural

property boundary. Fill operations commenced in the mid-1960s, when Rosenfeld, Andersen and Schnitzer owned the property. The ponds and overflow area on the Siltronic property were filled, and manufactured gas plant (MGP) waste, including tars and spent oxide, was buried or mixed into imported fill materials that were then placed on other portions of the present Siltronic property. The imported fill materials included dredge materials from the Willamette River dredging operations, quarry rock, overburden and other materials from offsite. Fill operations on the present Siltronic property continued until the entire property was filled to about 30 feet above mean sea level (MSL) by around 1977. Filling of low lying portions of the NW Natural property, including the former tar settling ponds and drainage ditch, occurred in the mid-1970s and involved mixing of tars from the tar settling pond area with imported quarry rock and overburden to similar elevations as at the adjacent Siltronic property.

g. Respondent, Siltronic Corporation began operating a silicon wafer manufacturing plant on its property in 1980. A solvent recovery system for trichloroethene (TCE) was utilized by Wacker Siltronic Corporation from 1980 to 1989, when TCE use at the facility was discontinued. This recovery system included three underground storage tanks which were in operation from 1980 to 1983, and were removed in 1985 after replacement by an above-ground trichloroethene process. In addition to releases from waste materials from the historical GASCO operations, TCE releases occurred on the Siltronic property. Current information indicates that a release or releases occurred at the Siltronic facility between 1980 to 1984. The release(s) resulted in a TCE plume of groundwater contamination extending from the former TCE handling and storage areas to the Willamette River

h. Related contaminants found in groundwater include: TCE and degradation products, such as vinyl chloride (VC) and dichloroethene (cis-1,2-DCE). Siltronic's upland groundwater investigations have detected up to 575 mg/L TCE and 6.3 mg/L vinyl chloride in groundwater at the northern portion of Siltronic's facility. In July 2003, TCE was detected at 20 feet below ground surface in soil (557 mg/kg) beneath the location of former underground TCE storage tanks also in the northern portion of the facility. In 2004, TCE, cis-1,2-DCE and 1,1-DCE were detected in soil slightly downgradient of the source area. TCE concentrations were 11,600 ug/kg and 3,830 ug/kg at 55 and 80 feet below ground surface, respectively.

i. In the Willamette River, TCE and its degradation products, predominantly cis-1,2-DCE and vinyl chloride (VC) have been detected in shallow groundwater (mudline to 2 feet) samples in the Willamette River in two separate areas: Area 1 where the groundwater plume has been detected discharging to the river; and Area 2, located north (downstream) of Area 1 and closer to the Siltronic/NW Natural property boundary. Area 2 is located offshore of Siltronic's National Pollutant Discharge Elimination System permitted outfall. Concentrations of TCE, cis-1,2-DCE and VC in shallow groundwater have been detected at 48.7 ug/L (TCE), 14,400 ug/L (cis-1,2,-DCE), and 11,900 ug/L (VC) within Area 1. In Area 2, concentrations of TCE, cis-1,2-DCE and VC have been detected at 88,500 ug/L (TCE), 67,000 ug/L (cis-1,2-DCE), and 4,300 ug/L (VC). As reported in the EPA/DEQ Joint Source Control Strategy tables, the ambient water quality standards (AWQCs) for protection of human health from fish consumption for TCE and VC are: 30 ug/L and 2.4 ug/L, respectively. A risk-based surface water screening level for the protection of ecological receptors for cis-1,2-DCE is 590 ug/L .

i. TCE was detected in Portland Harbor RI/FS sediment samples at Area 2 collected from 30 – 104 centimeters below mudline and from 104 - 230 centimeters below mudline respectively, at 1,900,000 ug/kg and 300,000 ug/kg. VC was detected in the 30 – 104 centimeters sample at an estimated 4,000 ug/kg. These samples were also saturated with MGP NAPL., into which TCE strongly partitions, and are not characteristic of co-located surface sediments collected between 0 and 30 cm bml, which were non-detect for TCE and its degradation products. The PEC for TCE is 2,100 ug/kg. Based on the proximity to the NPDES outfall and other investigations, it appears that a release of TCE through this outfall was the source of TCE impacts to Area 2 sediment.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

14. Based on the Findings of Fact set forth above EPA makes the following conclusions of law and determinations, which Respondents neither admit nor deny:

a. The GASCO Sediments Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found on and adjacent to the GASCO Sediments Site, as identified in the Findings of Fact above, includes "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and/or pollutants or contaminants which may present an imminent and substantial danger to the public health or welfare.

c. Respondents are "persons" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

d. Respondents are responsible parties under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and are liable for performance of response action and for response costs incurred and to be incurred for the GASCO Sediments Site. Respondents are "owners" and/or "operators" of GASCO Sediments Site, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1); and/or arranged for disposal or treatment of hazardous substances at the facility, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3).

e. The conditions described in the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C.§ 9601(22).

f. The removal response action required by this Settlement Agreement is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement Agreement, will be considered consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

g. A planning period of at least six months exists before field activities beyond sampling and related scoping activities required by this Settlement Agreement must be initiated.

VI. SETTLEMENT AGREEMENT AND ORDER

15. Based upon the foregoing Findings of Fact, Conclusions of Law and Determinations, and the administrative record for the GASCO Sediments Site, it is hereby Ordered and Agreed that Respondents shall comply with all provisions of this Settlement Agreement, including, but not limited to, all appendices to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR

16. Respondents shall retain one or more contractors to perform the work and shall notify EPA of the name(s) and qualifications of such contractor(s) within 10 days of the Effective Date. Respondents shall also notify EPA in writing of the name(s) and qualification(s) of any other contractor(s) or subcontractor(s) retained to perform the Work at least 7 days prior to that contractor's or subcontractor's commencement of such Work. EPA retains the right to disapprove any or all of the contractors and/or subcontractors retained by Respondents. If EPA disapproves a selected contractor, Respondents shall retain a different contractor and shall notify EPA of that contractor's name and qualifications within 10 days of EPA's disapproval.

17. Within 7 days after the Effective Date, Respondents shall designate a Project Coordinator who shall be responsible for administration of all actions by Respondents required by this Settlement Agreement and shall submit to EPA the designated Project Coordinator's name, address, telephone number, and qualifications. To the greatest extent possible, the Project Coordinator shall be present or readily available during field work. EPA retains the right to disapprove the designated Project

Coordinator. If EPA disapproves the designated Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number, and qualifications within 10 days following EPA's disapproval. Receipt by Respondents' Project Coordinator of any notice or communication from EPA relating to this Settlement Agreement shall constitute receipt by Respondents.

18. EPA has designated Sean Sheldrake of the Office of Environmental Cleanup (ECL), Region 10, as its Project Coordinator. Except as otherwise provided in this Settlement Agreement, Respondents shall direct all submissions required by this Settlement Agreement to the EPA Project Coordinator at 1200 Sixth Avenue, Suite 900, M/S ECL-115, Seattle, WA 98101 via electronic files to sheldrake.sean@epa.gov. Upon request by EPA, Respondents will also provide submissions on a compact disc. All requested electronic submissions must be formatted as directed by the EPA's Project Coordinator in order to be official file copies. Unless otherwise requested, EPA will not require hardcopy submissions of documents.

19. EPA and Respondents shall have the right, subject to Paragraph 17, to change their respective designated Project Coordinator. Respondents shall notify EPA 7 days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notice.

VIII. WORK TO BE PERFORMED

20. Respondents shall perform, at a minimum, all actions necessary to implement the Statement of Work (SOW), which is attached as Appendix A, and comply with the schedule attached to the SOW.

21. The EPA Guidance on Conducting Non-Time-Critical Removal Actions under Superfund (OSWER Directive 9360.0-32) and any additional relevant guidance shall be followed in implementing the SOW.

22. The removal response action goals are the further characterization, studies, analysis, and preliminary design that will lead ultimately to a final remedy at the GASCO Sediments Site. Conducting this work now will facilitate construction of the final remedy to begin expeditiously following issuance of a Record of Decision (ROD) for the Portland Harbor Superfund Site. The studies and other work under the SOW will be incorporated into the remedial investigation/feasibility study (RI/FS) for the remedy decision to be made for the Portland Harbor Superfund Site. This response action will include preference for removal of in-river materials containing "substantial product" (as defined in 3.6.2.1 of the SOW) such as Dense Non Aqueous Phase Liquid (DNAPL) and tar. It is anticipated that final remedial action will be implemented under a consent decree following EPA issuance of the ROD. Nonetheless, EPA reserves its claims and does not waive its authority to order the Respondents to perform response actions at the GASCO Sediment Site under CERCLA's order authorities either before or after a ROD is issued. Respondents agree that this Settlement Agreement does not address the timing or performance of cleanup work and that such work will be the subject of future orders or settlement agreements.

23. After review of any plan, report, or other item that is required to be submitted for approval pursuant to this Settlement Agreement and SOW, in a written notice to Respondents, EPA may: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondents modify the submission; or (e) any combination of the above. If EPA requires revisions, Respondents shall submit a revised document within 30 days of receipt of EPA's notification of the required revisions. However, EPA shall not modify a submission itself without first providing Respondents at least one notice of deficiency and an opportunity to cure within 30 days, except where to do so would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects. In the event that EPA modifies the submission to cure the deficiencies pursuant to this Section, EPA retains the right to seek stipulated penalties, as provided in Section XVIII. (Stipulated Penalties).

24. Respondents shall implement the Work as approved in writing by EPA. Once any plan, report or other document is approved, or approved with modifications, the subject document and any subsequent modifications, shall be incorporated into and become fully enforceable under this Settlement Agreement. Respondents shall not commence any Work except in conformance with the terms of this Settlement Agreement. Respondents shall not commence implementation of the Work until after receiving written EPA approval.

25. Quality Assurance and Sampling.

a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain-of-custody procedures. Respondents shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance. Respondents shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondents shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995) and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by EPA. A Quality Assurance Project Plan shall be prepared for each sample collection activity in accordance with: (1) "EPA Requirements for Quality Management Plans (QA/R5) (2001)" or the most current version; (2) for data validation, "Guidance on Environmental Data Verification and Validation, EPA QA/G8 (2002)", or the most current version; and (3) the EPA Functional Guidelines for Data Review. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

b. Upon written request by EPA, Respondents shall have such a laboratory analyze samples submitted by EPA for QA monitoring. Respondents shall provide to EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

c. Upon request by EPA, Respondents shall allow EPA or its authorized representatives to take split and/or duplicate samples. Respondents shall notify EPA not less than 14 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA shall have the right to take any additional samples that EPA deems necessary. EPA shall use its best efforts to notify Respondents not less than 14 days in advance of any sample collection activity EPA conducts, and allow Respondents to take split or duplicate samples of any samples it takes as part of its oversight of Respondents' implementation of the Work.

26. Reporting.

a. After the Effective Date and until EPA issues a Notice of Completion of Work pursuant to Section XXVIII, Respondents shall submit a written progress report to EPA concerning actions undertaken pursuant to this Settlement Agreement on the fifteenth day of each month, unless otherwise directed in writing by the EPA Project Coordinator. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

b. Respondents shall, at least 30 days prior to the conveyance of any interest in the GASCO Sediments Site or any of Respondents' adjacent upland property give: (1) written notice to the transferee that the GASCO Sediments Site is subject to this Settlement Agreement; and (2) written notice to EPA of the proposed conveyance, including the name and address of the transferee. Such notices shall be given even if the property transferred is not within the final boundaries of the GASCO Sediments Site. Respondents shall also, as a condition of the transfer, require that the transferee and its successors comply with Sections IX (Access and Institutional Controls) and X (Access to Information) of this Settlement Agreement unless, based on the specific circumstances of the transfer and/or transferee, EPA determines that conditioning the transfer in that manner is not necessary.

27. Off-Site Shipments.

a. Respondents shall, prior to any off-site shipment of Waste Material from the GASCO Sediments Site under this Settlement Agreement to an off-site waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. However, this notification requirement shall not apply to any off-site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

i. Respondents shall include in the written notification the following information: 1) the name and location of the facility to which the waste material is to be shipped; 2) the type and quantity of the waste material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of

transportation. Respondents shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the waste material to another facility within the same state, or to a facility in another state.

ii. The identity of the receiving facility and state will be determined by Respondents following the award of the contract for the response action. Respondents shall provide the information required by Paragraph 27(a) and 27(b) as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from the GASCO Sediments Site to an off-site location, Respondents shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondents shall only send hazardous substances, pollutants, or contaminants from the GASCO Sediments Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

IX. ACCESS/INSTITUTIONAL CONTROLS

28. If any portion of the GASCO Sediments Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by Respondents, Respondents shall, commencing on the Effective Date, provide EPA and DEQ, their representatives, including contractors or agents, with access at all reasonable times to the GASCO Sediments Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement. Respondents shall,

commencing on the Effective Date and, after reasonable advance notice unless accompanied by EPA or DEQ, provide the Tribal Governments, and Natural Resource Trustees, and their representatives, including contractors and agents, with access at all reasonable times to the GASCO Sediments Site, or such other property, for the purpose of consulting on the Work required under this Settlement Agreement, or in the case of cultural resource issues, overseeing the Work required under this Settlement Agreement. If, during or after the removal action is complete, restrictions on the use of Respondents' property, including beds or banks of the river, is necessary to protect public health, welfare, or the environment or maintain the removal action or avoid exposure to hazardous substances, pollutants or contaminants, Respondents shall take any and all actions to establish, implement, and maintain the necessary Institutional Controls. Respondents shall establish, implement, and maintain the necessary Institutional Controls on the schedule and for the duration determined necessary by EPA before or after the EE/CA and/or any subsequent work plans or reports developed under this Settlement Agreement.

29. Where any action under this Settlement Agreement is to be performed on property or in areas, managed or owned by or in possession of someone other than Respondents, Respondents shall use best efforts to obtain all necessary access agreements. For property under the management of the Oregon Department of State Lands, Respondents shall use best efforts to obtain necessary access agreement within 45 days of the Effective Date of this Settlement Agreement. For property owned or controlled by any other person, Respondents shall use best efforts to obtain all necessary access agreements no later than 30 days after EPA determines such access is needed. The

access agreements shall provide access to EPA, DEQ, the Tribal Governments, and Natural Resource Agencies to the same extent as provided in Paragraph 28 above. If, during or after the removal action is complete, restrictions on the use of property are necessary and such property is owned by or in the possession of someone other than Respondents, Respondents shall use best efforts to establish and implement controls it has the capability of implementing, or have such use restrictions established and implemented by the owner on the schedule determined by EPA. Respondents shall notify EPA if, after using its best efforts, it is unable to obtain access agreements or use restrictions. In such notice, Respondents shall describe in writing its efforts to obtain access or the use restrictions. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access or loss of use. EPA may then assist Respondents in gaining access or establishing use restrictions, to the extent necessary to effectuate the response action or maintain it as described herein, using such means as EPA deems appropriate. Respondents shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access or use restrictions, in accordance with the procedures in Section XV (Payment of EPA Future Response Costs and Tribal Response Costs).

30. Notwithstanding any provision of this Settlement Agreement, EPA retains all of its access authorities and rights, as well as all of its rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

X. ACCESS TO INFORMATION

31. Respondents shall provide copies to EPA, upon request, of all documents and information within its possession or control or that of its contractors or agents relating to the GASCO Sediments Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain-of-custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondents shall also make available to EPA, upon request, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

32. Respondents may assert business confidentiality claims covering part or all of the documents or information submitted to EPA under this Settlement Agreement, to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Respondents that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondents.

33. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondents assert such a privilege in lieu of providing

documents, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents, reports or other information required to be created or generated by this Settlement Agreement shall be withheld on the grounds that they are privileged.

34. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the GASCO Sediments Site.

XI. RECORD RETENTION

35. Until 10 years after Respondents' receipt of EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondents shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the work or the liability of any person under CERCLA with respect to the GASCO Sediments Site, regardless of any internal retention policy to the contrary unless Respondents have received EPA's written permission to destroy such documents. Until 10 years after Respondents' receipt of EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondents shall also instruct their contractors and agents to preserve all documents,

records, and information of whatever kind, nature or description relating to performance of the Work.

36. At the conclusion of this document retention period, Respondents shall notify EPA at least 90 days prior to the destruction of any such records or documents, and, upon request by EPA, Respondents shall deliver any such records or documents to EPA. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondents assert such a privilege, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents, reports or other information required to be created or generated by this Settlement Agreement shall be withheld on the grounds that they are privileged.

37. Each Respondent hereby certifies individually that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Portland Harbor Superfund Site since notification of potential liability by EPA and it has fully complied with any and all EPA requests for information pursuant to Section 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e) and Section 3007 of RCRA, 42 U.S.C. § 6927 as also certified in its responses to such EPA requests.

XII. COMPLIANCE WITH OTHER LAWS

38. Respondents shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental, state environmental or facility siting laws. No local, state, or federal permit shall be required for any action conducted entirely on-site, including studies, where such action is selected and carried out in compliance with this Settlement Agreement. Respondents shall identify ARARs in the EE/CA subject to EPA approval.

XIII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

39. In the event of any action or occurrence during performance of the Work which causes or threatens to cause a release of Waste Material from the GASCO Sediments Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action. Respondents shall take these actions in accordance with all applicable provisions of this Settlement Agreement, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify the EPA Project Coordinator or, in the event of his/her

unavailability, the Regional Duty Officer, Environmental Cleanup Office, Emergency Response Unit, EPA Region 10, (206) 553-1263, of the incident or conditions. In the event that Respondents fail to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondents shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XV (Payment of Response Costs).

40. In addition, in the event of any release of a hazardous substance from the GASCO Sediments Site, Respondents shall immediately notify the EPA Project Coordinator and the National Response Center at (800) 424-8802. Respondents shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11001, *et seq*.

XIV. AUTHORITY OF EPA PROJECT COORDINATOR

41. The EPA Project Coordinator shall be responsible for overseeing Respondents implementation of this Settlement Agreement. The Project Coordinator shall have the authority vested in an On-Scene Coordinator (OSC) by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the GASCO Sediments Site, as well as the authority of a Remedial Project Manager (RPM) as set forth in the NCP. Absence of

the EPA Project Coordinator from the GASCO Sediments Site shall not be cause for stoppage of work unless specifically directed by the EPA Project Coordinator.

XV. PAYMENT OF EPA AND TRIBAL RESPONSE COSTS

42. Payments for EPA Future Response Costs.

a. Respondents shall pay EPA all Future Response Costs not inconsistent with the NCP. On a periodic basis, EPA will send Respondents' Project Coordinator a bill requiring payment that includes a certified Agency Financial Management System summary (SCORPIOS) cost summary report or other regionally prepared cost summary. The bill will include Future Response Costs as defined in this Settlement Agreement. Respondents shall make all payments within 30 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 45 of this Settlement Agreement.

b. Respondents shall make all payments to EPA required by this Paragraph by a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund-Portland Harbor Special Account," referencing the name and addresses of the Respondents, the Docket Number of this Settlement Agreement, and EPA Site/Spill ID Number 10EW and shall be clearly designated as Response Costs: Portland Harbor Superfund Site, GASCO Sediments Site. Respondents shall send the check(s) to the following address:

US Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
P.O. Box 979076
St. Louis, MO 63197-9000

c. At the time of payment, Respondents shall send notice that payment has been made to: (1) the EPA Project Coordinator; (2) to the following email: acctsreceivable.cinwd@epa.gov; and (3) to EPA Cincinnati Finance Office, 26 Martin Luther King Drive, MS-NWD, Cincinnati, OH 45268.

43. The total amount to be paid to EPA by Respondents pursuant to Paragraph 42(a) of this Settlement Agreement shall be deposited in the Portland Harbor Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Portland Harbor Superfund Site, or to be transferred by EPA to the Hazardous Substance Superfund.

44. If payments for Future Response Costs are not made within 30 days of Respondents' receipt of a bill, Respondents shall pay Interest on the unpaid balance. The Interest on Future Response Costs shall begin to accrue on the date of Respondents' receipt of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XVIII.

45. Respondents may dispute all or part of a bill for Future Response Costs submitted under this Settlement Agreement, if Respondents allege that EPA has made an accounting error, or if Respondents allege that a cost item is inconsistent with the NCP or outside the scope of the Settlement Agreement. Such dispute shall be made in writing within 30 days of receipt of the bill and must be sent to the EPA Project Coordinator. Any dispute shall specifically identify the contested Future Response Costs and the basis

for the objection. If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondents shall pay the full amount of the uncontested costs to EPA as specified in Paragraph 42(b) of this Settlement Agreement on or before the due date. Within the same time period, Respondents shall pay the full amount of the contested costs into an interest-bearing escrow account in a federally-insured bank duly chartered in the State of Oregon. Respondents shall simultaneously transmit a copy of both checks to the persons listed in Paragraph 42(c) above, together with a copy of the correspondence that established and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account to the EPA Project Coordinator. Respondents shall ensure that the prevailing party or parties in the dispute shall receive the amount upon which they prevailed from the escrow funds plus Interest within 10 days after the dispute is resolved.

46. Payment of Past Tribal Response Costs.

a. Within 30 days of the execution of this Settlement Agreement, the Tribal Governments shall submit invoices to the Respondents for past costs associated with the development of this Settlement Agreement. Respondents shall notify the Tribal Governments in writing within forty-five (45) days of receipt of invoices for the Tribal Governments' past Tribal Response Costs whether Respondents approve them for payment. For all past Tribal Response Costs not approved by Respondents, this written notice must include a detailed justification for non-approved response costs. Past response costs for which Tribal Governments do not receive written notice within forty-

five (45) days are deemed approved and uncontested. Respondents and the Tribal Governments may negotiate to reach agreement on past cost payments. Respondents shall pay approved response costs within thirty (30) days of the date of Respondents notice of the approval. The invoices shall cover the Tribal Governments' costs incurred for the period between notification by EPA of the possible early action in November of 2008 and the effective date of this Settlement Agreement. The Tribal Governments' supporting documentation shall consist of timesheets and/or payroll reports, travel expense reports, and contractor invoices. For tribal consultants, for each project manager, senior associate and principal, a spreadsheet shall detail the following information: date, task, staff member, and hours billed. Expenses shall be detailed, and backup documentation shall be provided for all expenses.

b. Respondents and the Tribal Governments reserve all rights and claims they may have regarding any amounts in the past cost invoices not approved and paid by Respondents. Respondents reserve all rights, privileges, and defenses they may have to challenge and/or defend such claims. All claims arising from and related to unpaid Tribal Response Costs shall be brought in the United States District Court for the District of Oregon.

c. Respondents, or either of them, may, in their sole discretion, dispute all or part of an invoice for Past Tribal Response Costs submitted under this Settlement Agreement, if Respondents allege that the Tribal Government has made an accounting error, if Respondents allege that a cost item is inconsistent with the NCP, if Respondents allege that a cost item is not within the definition of "Tribal Response Costs," or if Respondents allege that the Tribal Governments failed to provide the

documentation required in Paragraph 46(a). Respondents shall identify any disputed costs and the basis for their objection. Respondents shall bear the burden of establishing facts sufficient to support their allegation(s). Disputes of Past Tribal Response Costs shall be handled pursuant to Paragraph 47.e.

47. Payment of Future Tribal Response Costs.

a. After the effective date of this Consent Settlement Agreement, Respondents shall pay the Tribal Governments, in advance, for Tribal Response Costs incurred pursuant to this Settlement Agreement.

b. Within thirty (30) days of the effective date of this Settlement Agreement, and 45 days prior to the beginning of each fiscal year thereafter until EPA issues a Notice of Completion of Work, Respondents and the Tribal Governments shall meet to discuss the work to be performed under this Settlement Agreement and to negotiate an estimated annual budget for Tribal Response Costs. The Tribal Governments shall develop a reasonable estimated budget (with an appropriate contingency) for Tribal Response Costs for the fiscal year, which shall separately identify anticipated costs for each Tribal Government and their technical consultants. The estimated annual budget shall separately identify the activities to be performed with an estimate of costs associated with such types of activities. Respondents shall notify the Tribal Governments of their approval or disapproval of the estimated budget within 30 days of receipt. Within fifteen (15) days of the date of Respondents' written notification to the Tribal Governments of Respondents' approval of the estimated budget, Respondents shall remit a check for the amount identified in the approved estimated budget made payable to the corresponding Tribal Government at the appropriate address.

The amount identified for the five tribes' shared technical consultant (Stratus Consulting) shall be sent to the Confederated Tribes of the Grand Ronde Community of Oregon. The amount identified for Ridolfi shall be sent to the Confederated Tribes and Bands of the Yakama Nation. Respondents and the Tribal Governments reserve all rights and claims they may have regarding any amounts in the estimated budget not approved and paid by Respondents. Respondents reserve all rights, privileges and defenses it may have to challenge and/or defend such claims. All claims arising from and related to unpaid Tribal Response costs shall be brought in the United States District Court for the District of Oregon. The addresses of the Tribal Governments are as follows:

The Confederated Tribes of the Grand Ronde Community of Oregon

Attn: Accounting Department
The Confederated Tribes of the Grand Ronde Community of Oregon
9615 Grand Ronde Road
Grand Ronde, Oregon 97347

The Confederated Tribes of Siletz Indians of Oregon

Attn: Karen Bell
Accounting Department
The Confederated Tribes of Siletz Indians of Oregon
P.O. Box 549
Siletz, Oregon 97380

The Confederated Tribes of the Umatilla Indian Reservation

Attn: Accounts Receivable, Finance Department
The Confederated Tribes of the Umatilla Indian Reservation
P.O. Box 638
Pendleton, Oregon 97801

The Confederated Tribes of the Warm Springs Reservation of Oregon
Attn: Finance Department
The Confederated Tribes of the Warm Springs Reservation of Oregon
P.O. Box C
Warm Springs, Oregon 97761

The Nez Perce Tribe

Attn: Office of Legal Counsel
The Nez Perce Tribe
P.O. Box 305
Lapwai, Idaho 83540

The Confederated Tribes and Bands of the Yakama Nation

Central Accounting
The Confederated Tribes and Bands of the Yakama Nation
P.O. Box 151
Toppenish, WA 98948

c. Within thirty (30) days of the close of the estimated budget period, the Tribal Governments shall provide supporting documentation to the Respondents for Response Costs reimbursed by the Respondents. The Tribal Governments' supporting documentation shall consist of timesheets and/or payroll reports, travel expense reports, and contractor invoices. For tribal consultants, for each project manager, senior associate and principal, a spreadsheet shall detail the following information: date, task, staff member, and hours billed. Expenses shall be detailed, and backup documentation shall be provided for all expenses.

d. In the event that the Tribal Governments have overestimated the amount of funding required for a budget period and the Respondents have paid more than the amount of Tribal Response Costs incurred for work during such budget period, the Tribal Governments shall apply such overpayments to reimburse Tribal Response Costs in the following budget period. To the extent that the Tribal Governments have incurred Tribal Response costs in addition to the estimated budget for the budget period, the additional costs shall be included in the estimate for the subsequent budget period. At the completion of the Work under this Settlement Agreement, all unexpended funds

advanced to the Tribal Governments for Tribal Response Costs shall be refunded to Respondents.

e. Following the receipt of support documentation provided in Subsection c. above, Respondents may dispute all or a portion of Tribal Response Costs reimbursed or not approved by Respondents during the previous budget period under this Settlement Agreement, if Respondents allege that the Tribal Government has made an accounting error, if Respondents alleges that a cost item is inconsistent with the NCP, if Respondents allege that a cost item is not within the definition of "Tribal Response Costs,", or if Respondents allege that the Tribal Governments failed to provide the documentation required in Paragraph 47(c). Respondents shall identify any disputed costs and the basis for their objection. Respondents shall bear the burden of establishing facts in support of their allegations. Respondents, in their sole discretion, may choose to invoke the dispute resolution provisions of Section XVI, provided that Respondents' notice of their objections under paragraph 48 shall be made to the appropriate Tribal Government, in addition to EPA, and the appropriate Tribal Government shall prepare a written response to Respondents' written objections. EPA shall make the final decision on the dispute subject to the rights reserved by Respondents and the Tribal Governments in this Settlement Agreement. Nothing in this paragraph shall in any way be construed to limit the rights of the Tribal Governments to seek to recover response costs incurred by the Tribal Governments related to this Settlement Agreement and not reimbursed by Respondents, and for natural resource liability. Nothing in this paragraph shall in any way be construed to limit any rights, privileges and defenses Respondents may have to challenge and/or defend claims arising from or related to unpaid Tribal Response Costs

or natural resource liability. All claims arising between the Tribal Governments and Respondents related to Tribal Response Costs and natural resource liability shall be brought in the United States District Court for the District of Oregon.

XVI. DISPUTE RESOLUTION

48. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally. In accordance with Section XV., Paragraphs 46(c) and 47(e) of this Settlement Agreement, the Tribal Governments shall provide written responses to Respondents' disputes about Tribal Response Costs, and Respondents and the Tribal Governments will engage in negotiations to resolve disputes in accordance with Paragraph 49 below. EPA may be a decision maker pursuant to Paragraph 50 below.

49. If Respondents object to any EPA action taken pursuant to this Settlement Agreement, including billings for EPA Future Response Costs, they shall notify EPA in writing of their objection(s) within 14 days of such action, unless the objection(s) has/have been resolved informally, or EPA has agreed in writing to extend the informal dispute resolution period. Respondents' notice shall provide all of the reasons for its objections and attach any supporting information or documentation that it is relying on to raise the dispute. EPA and Respondents shall then have 30 days from EPA's receipt of Respondents' written objection(s) to resolve the dispute through formal negotiations (the "Negotiation Period") with EPA's Remedial Action Unit Manager. EPA may, in its sole

discretion, prepare a written response to Respondents' written objections. The Negotiation Period may be extended at the sole discretion of EPA. At EPA's discretion and approval, the dispute record may be supplemented during the Negotiation Period.

50. Any agreement reached by the parties pursuant to this Section shall be in writing and shall, upon signature by all Parties, be incorporated into and become an enforceable part of this Settlement Agreement. If the Parties are unable to reach an agreement within the Negotiation Period, EPA's position shall be the final decision and binding upon Respondents, unless within 5 days of the end of the Negotiation Period, Respondents requests the determination of EPA Region 10's Director of the Office of Environmental Cleanup (ECL). If the Director is not available to render a timely decision, the Director may delegate the decision-making function to the Associate Director of ECL. The Director will issue a written decision on the dispute to Respondents based on the record created pursuant to Paragraph 49 above. EPA's decision shall be incorporated into and become an enforceable part of this Settlement Agreement. Respondents' obligations under this Settlement Agreement that are not affected by the disputed issue(s) shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs.

XVII. FORCE MAJEURE

51. Respondents agree to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement and SOW, unless the performance is delayed by a *force majeure*. For purposes of this Settlement Agreement, a *force majeure* is defined as any event arising from causes beyond the control of Respondents, or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondents' best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work, or increased cost of performance, or a failure to attain performance standards/action levels selected by EPA.

52. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondents shall notify EPA orally within 48 hours of when Respondents first knew that the event might cause a delay. Within 10 days thereafter, Respondents shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondents' rationale for attributing such delay to a *force majeure* event if they intend to assert such a claim, including supporting documentation for such a claim; and a statement as to whether, in the opinion of Respondents, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondents from asserting any claim of *force majeure* for that event for the

period of time of such failure to comply and for any additional delay caused by such failure.

53. If EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that is affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify Respondents in writing of its decision. In that event, Respondents may invoke the dispute resolution provisions of Section XVI. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify Respondents in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XVIII. STIPULATED PENALTIES

54. Respondents shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 55 and 56 for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVII (*Force Majeure*). "Compliance" by Respondents shall include completion of the activities under this Settlement Agreement or any work plan, or other plan approved under this Settlement Agreement, in accordance with all applicable requirements of law, this Settlement Agreement, all Appendices, and any plans, reports or other documents

approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement.

55. Stipulated Penalty Amounts - Work.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 55(b):

Penalty Per Violation Per Day	Period of Noncompliance
$ 500	1st through 7th day
$ 1,000	8th through 14th day
$ 2,500	15th through 30th day
$ 5,000	31st day and beyond

b. The final and all submitted drafts of the following Compliance Milestones:

i. Work Plan;

ii. Area Identification Report and Data Gaps Report;

iii. EE/CA and Data Report;

iv. Biological Assessment and Clean Water Act Analysis;

v. Preliminary Design;

vi. Interim Design; and

vii. Health and Safety Plans.

56. Stipulated Penalty Amounts - Reports, Other Non-Compliance, including late Payment of Future Response Costs. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate final and all submitted draft reports or other written documents pursuant to this Settlement Agreement that are not

listed in Paragraph 55(b). The following stipulated penalties shall accrue per violation per day for any non-compliance with the requirements of this Settlement Agreement, including late payments of EPA Future Response Costs.

Penalty Per Violation Per Day	Period of Noncompliance
$ 250	1st through 7th day
$ 500	8th through 14th day
$ 1,500	15th through 30th day
$ 2,500	31st day and beyond

57. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 68 of Section XX, Respondents shall be liable for a stipulated penalty in the amount of $200,000 or 25% of the cost of the Work EPA performs, whichever is less.

58. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: 1) with respect to a deficient first draft submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondents of any deficiency; and 2) with respect to an issue that Respondents chooses to seek a decision by the ECL Director or Associate Director under Section XVI (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period ends until the date that the ECL Director or Associate Director issues a final

decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

59. Following EPA's determination that Respondents have failed to comply with a requirement of this Settlement Agreement, EPA may give Respondents written notification of the failure and describe the noncompliance. EPA may send Respondents a written demand for payment of the penalties. Except for deficient first draft submissions as provided in the preceding Paragraph, penalties shall accrue regardless of whether EPA has notified Respondents of a violation.

60. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondents' receipt from EPA of a demand for payment of the penalties, unless Respondents invokes the dispute resolution procedures under Section XVI (Dispute Resolution). All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be mailed to the address set forth in Paragraph 42.c, above, shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site/Spill ID Number 10EW, the EPA Docket Number of this Settlement Agreement, and the name and address of the parties making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to EPA as provided in Paragraph 17, and to other receiving officials at EPA identified in Paragraph 42.c, above.

61. The payment of penalties shall not alter in any way Respondents' obligation to complete performance of the Work required under this Settlement Agreement.

62. Penalties shall continue to accrue during any dispute resolution period, except as provided in Paragraph 58 above, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

63. If Respondents fails to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondents shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to this Section. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondents' violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(l) of CERCLA, 42 U.S.C. §§ 9606(b) and 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that EPA shall not seek civil penalties pursuant to Section 106(b) or 122(l) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of this Settlement Agreement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Section XX, Paragraph 68.

64. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XIX. COVENANT NOT TO SUE BY EPA

65. In consideration of the actions that will be performed and the payments that will be made by Respondents under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondents pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work and EPA Future Response Costs. This covenant not to sue shall take effect upon the Effective Date and is conditioned upon the complete and satisfactory performance by Respondents of all obligations under this Settlement Agreement, including, but not limited to, payment of EPA Future Response Costs pursuant to Section XV. This covenant not to sue extends only to Respondents and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY EPA

66. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the GASCO Sediments Site or Portland Harbor Superfund Site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional response actions or activities pursuant to CERCLA or any other applicable law.

67. The covenant not to sue set forth in Section XIX above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondents with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondents to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definition of EPA Future Response Costs;

c. liability for injunctive relief or administrative order enforcement under Section 106 of CERCLA, 42 U.S.C. § 9606 for performance of response action other than the Work;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the GASCO Sediments Site; and

g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the GASCO Sediments Site or the Portland Harbor Superfund Site.

68. Work Takeover. In the event EPA determines that Respondents have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may

assume the performance of all or any portion of the Work as EPA determines necessary. Respondents may invoke the procedures set forth in Section XVI (Dispute Resolution) to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by the United States in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondents shall pay pursuant to Section XV (Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXI. COVENANT NOT TO SUE BY RESPONDENTS

70. Subject to the reservation contained in Paragraph 71 below, Respondents covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, EPA Future Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law; or

b. any claim arising out of response actions at or in connection with the Work, including any claim under the United States Constitution, the Oregon State Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law.

71. Respondents covenant not to sue and agree not to assert any claims or causes of action against EPA, or its contractors or employers, with respect to Work or EPA's Future Response Costs pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613. Nothing in this Settlement Agreement shall preclude Respondents from asserting claims or causes of action pursuant to Section 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, against agencies or departments of the United States other than EPA.

72. a. Except as provided in Paragraph 79, these covenants not to sue shall not apply in the event the United States brings a cause of action or issues a Settlement Agreement pursuant to the reservations set forth in Paragraphs 67 (b), (c) and (e) - (g), but only to the extent that Respondents' claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

b. Respondents reserve, and this Order is without prejudice to, claims against the United States subject to the provisions of Chapter 171 of Title 28 of the United States Code, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States while acting within the scope of his office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, any such claim shall not include a claim for any damages caused, in whole or in part, by the act or omission of any person, including any contractor, who is not a federal employee as that term is defined in 28 U.S.C. § 2671; nor shall any such claim

include a claim based on EPA's selection of response actions, or the oversight or approval of Respondents' plans or activities. The foregoing applies only to claims that are brought pursuant to any statute other than CERCLA and for which the waiver of sovereign immunity is found in a statute other than CERCLA.

73. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXII. OTHER CLAIMS

74. By issuance of this Settlement Agreement, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or EPA shall not be deemed a party to any contract entered into by Respondents or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

75. Except as expressly provided in Section XIX and XXIII (Covenant Not to Sue by EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

76. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIII. CONTRIBUTION

77. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. §9613(f)(2), and that Respondents are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), or as may be otherwise provided by law, for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work as described in the SOW and EPA Future Response Costs as defined in this Settlement Agreement. Nothing in this subparagraph is intended to modify, waive or impair any contractual agreements between the Respondents.

b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. §9613(f)(3)(B), pursuant to which Respondents have, as of the Effective Date, resolved their liability to the United States for the Work and EPA Future Response Costs.

c. Nothing in this Settlement Agreement precludes the United States or Respondents from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing in this Settlement Agreement diminishes the right of the United

States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. §9613(f)(2-3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

78. Respondents agree that with respect to any suit or claim for contribution brought by it for matters related to this Settlement Agreement, it will notify EPA in writing no later than 60 days prior to the initiation of such suit or claim. Respondents further agree that with respect to any suit or claim for contribution brought against them for matters related to this Settlement Agreement, it will notify EPA in writing within 10 days of service of the complaint on it. In addition, Respondents shall notify EPA within 10 days of service or receipt of any Motion for Summary Judgment and within 10 days of receipt of any Settlement Agreement from a court setting a case for trial.

79. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the GASCO Sediments Site, Respondents shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been addressed in this Settlement Agreement; provided, however, that nothing in this Paragraph affects the enforceability of the covenants not to sue set forth in this Settlement Agreement.

XXIV. INDEMNIFICATION

80. Respondents shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondents, its officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondents agrees to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondents, its officers, directors, employees, agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Settlement Agreement. Neither Respondents nor any such contractor shall be considered an agent of the United States.

81. The United States shall give Respondents notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondents prior to settling such claim.

82. Respondents waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between Respondents and any person for performance of Work on or relating to the GASCO Sediments Site, including, but not limited to, claims on account of construction delays.

In addition, Respondents shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Respondents and any person for performance of Work on or relating to the GASCO Sediments Site, including, but not limited to, claims on account of construction delays. The waiver in this Paragraph does not apply to any potential CERCLA contribution or cost recovery claims Respondents may have against the United States for response costs incurred in performing Work under this Settlement Agreement.

XXV. INSURANCE

83. At least 7 days prior to commencing any field work under this Settlement Agreement, Respondents shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance and automobile insurance with limits of $1 million ($1,000,000), per occurrence, plus umbrella insurance in excess of the comprehensive general liability and automobile liability coverage in the amount of $4 million ($4,000,000) per occurrence. Within the same time period, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. In addition, for the duration of the Settlement Agreement, Respondents shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondents in furtherance of this Settlement Agreement. If Respondents demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or

insurance covering some or all of the same risks but in an equal or lesser amount, then Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVI. FINANCIAL ASSURANCE

84. Within 30 days of the Effective Date and on the anniversary of the Effective Date every year thereafter until Notice of Completion of the Work in accordance with Section XXVIII below is received from EPA, Respondents shall establish and maintain financial security for the benefit of EPA in the amount of $3 million ($3,000,000) in one or more of the following forms, in order to secure the full and final completion of Work by Respondents. Within 30 days of the Effective Date, financial security under this Settlement Agreement shall be established in one or more of the following forms for the full amount required:

a. A surety bond unconditionally guaranteeing payment and/or performance of the Work;

b. One or more irrevocable letters of credit, payable to or at the direction of EPA, issued by financial institution(s) acceptable in all respects to EPA;

c. A trust fund administered by a trustee acceptable in all respects to EPA;

d. A policy of insurance issued by an insurance carrier acceptable in all respects to EPA, which ensures the payment and/or performance of the Work;

e. A written guarantee to pay for or perform Work provided by one or more parent companies of Respondents, or by one or more unrelated companies that have

a substantial business relationship with at least one of Respondents; including a demonstration that any such guarantor company satisfies the financial test requirements of 40 C.F.R. Part 264.143(f); and/or

f. A demonstration of sufficient financial resources to pay for the Work made by one or more of the Respondents, which shall consist of a demonstration that any such Respondent satisfies the requirements of 40 C.F.R. Part 264.143(f).

85. Any and all financial assurance instruments provided pursuant to this Section shall be in form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section (including, without limitation, the instrument(s) evidencing such assurances) are inadequate, Respondents shall, within 30 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 84, above. In addition, if at any time EPA notifies Respondents that the anticipated cost of completing the Work has increased, then, within 30 days of such notification, Respondents shall obtain and present to EPA for approval a revised form of financial assurance (otherwise acceptable under this Section) that reflects such cost increase. Respondents' inability to demonstrate financial ability to complete the Work shall in no way excuse performance of any activities required under this Settlement Agreement.

86. If Respondents seek to ensure completion of the Work through a guarantee pursuant to Subparagraph 84(e) or 84(f) of this Settlement Agreement, Respondents shall (i) demonstrate to EPA's satisfaction that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f); and (ii) resubmit sworn statements conveying the information

required by 40 C.F.R. Part 264.143(f) annually, on the anniversary of the Effective Date or such other date as agreed by EPA, to EPA. For the purposes of this Settlement Agreement, wherever 40 C.F.R. Part 264.143(f) references "sum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimates," the dollar amount to be used in the relevant financial test calculations shall be the current cost estimate of $3 Million for the Work at the Site plus any other RCRA, CERCLA, TSCA, or other federal environmental obligations financially assured by the relevant Respondent or guarantor to EPA by means of passing a financial test.

87. If, after the Effective Date, Respondents can show that the estimated cost to complete the remaining work has diminished below the amount set forth in Paragraph 84 of this Section, Respondents may, on any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining work to be performed. Respondents shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security upon approval by EPA. In the event of a dispute, Respondents may reduce the amount of the security in accordance with the written decision resolving the dispute.

88. Respondents may change the form of financial assurance provided under this Section at any time, upon notice to and approval by EPA, provided that the new form of assurance meets the requirements of this Section. In the event of a dispute, Respondents may change the form of the financial assurance only in accordance with the written decision resolving the dispute.

XXVII. MODIFICATIONS

89. EPA may determine that in addition to tasks defined in the SOW, or initial approved work plan, other additional work may be necessary to accomplish the objectives of the removal action. EPA may request in writing Respondents to perform these response actions and Respondents shall confirm its willingness to perform the additional work, in writing, to EPA within 14 days of receipt of EPA's request, or Respondents may invoke dispute resolution in accordance with Section XVI. Subject to EPA resolution of any dispute, Respondents shall implement the additional tasks which EPA determines are necessary. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties.

90. If Respondents seek permission to deviate from any approved work plan or schedule or the Statement of Work, Respondents' Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondents may not proceed with the requested deviation until receiving written approval from the EPA Project Coordinator pursuant to Paragraph 24.

91. No informal advice, guidance, suggestion, or comment by the EPA Project Coordinator or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of its obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXVIII. NOTICE OF COMPLETION OF WORK

92. Upon the request of Respondents or on its own initiative, EPA may determine, after its review of the Final Design Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including but not limited to, Institutional Controls and monitoring, if any, payment of EPA Future Response Costs, or record retention, and EPA will provide written notice to Respondents. EPA will use best efforts to respond to Respondents' request in a timely manner. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondents, provide a list of the deficiencies, and require that Respondents correct such deficiencies, or modify the Removal Action Work Plan, if necessary. Respondents shall correct the deficiencies or, if appropriate, implement the modified and approved Work Plan, and shall submit a modified Final Design Report in accordance with the EPA notice, subject to its right to invoke dispute under Section XVI of this Settlement Agreement. Failure by Respondents to implement the approved modified Work Plan shall be a violation of this Settlement Agreement. This Settlement Agreement shall be terminated if all obligations and uncompleted Work required by this Settlement Agreement is included in a consent decree with Respondents and/or other persons and entered as a final judgment.

XXIX. INTEGRATION/APPENDICES

93. This Settlement Agreement and its appendices constitute the final, complete and exclusive agreement and understanding among the Parties with respect to

the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following appendices are attached to and incorporated into this Settlement Agreement:

a. Appendix A: Statement of Work.

XXX. EFFECTIVE DATE

94. This Settlement Agreement shall be effective on the day it is issued by EPA. Each undersigned representative of Respondents certify that (s)he is fully authorized to enter into the terms and conditions of this Settlement Agreement and to bind Respondent.

XXXI. NOTICES AND SUBMISSIONS

95. Documents including work plans, reports, approvals, disapprovals, and other correspondence required to be submitted under this Settlement Agreement, shall be sent to the individuals at the addresses specified below in the format indicated. All agencies and governments are responsible for giving written notice of a change to Respondents and the other parties. All notices and submissions shall be considered effective one business day after receipt by Respondents' Project Coordinator, unless otherwise provided.

a. One (1) copy of EPA correspondence or other communications to Respondents' Project Coordinator in electronic form: and

b. Respondents shall submit all documents in electronic form to sheldrake.sean@epa.gov or via CD-ROM. Only if requested, three (3) hard copies of documents to be submitted to EPA shall be forwarded to:

Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
MS ECL-115
Seattle, Washington 98101

c. One (1) hardcopy of documents or electronic file shall be submitted to DEQ:

James M. Anderson
DEQ Northwest Region
2020 SW Fourth Ave, Suite 400
Portland, Oregon 97201
anderson.jim@deq.state.or.us

Electronic file or CD-ROM transmissions to the following contacts:

d. Oregon Department of Fish & Wildlife:

Rick Kepler
Oregon Department of Fish & Wildlife
2501 SW First Avenue
Portland, Oregon 97207
rick.j.kepler@state.or.us

e. NOAA:

Rob Neely
Coastal Resources Coordination
c/o EPA Region 10
1200 Sixth Avenue (MS ECL-117)
Seattle, WA 98101
Rob.neely@noaa.gov

Dr. Nancy Munn
NOAA Fisheries
525 NE Oregon Street, Suite 500
Portland, Oregon 97232-2737
nancy.munn@noaa.gov

f. USFW:

Jeremy Buck
US Fish & Wildlife
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266
jeremy_buck@r1.fws.gov

Kemper McMaster, State Supervisor
U.S. Fish and Wildlife Service
Oregon Fish and Wildlife Office
2600 SE 98th Ave., Suite 100
Portland, Oregon 97266
Kemper_McMaster@fws.gov

g. U.S. Department of Interior:

Preston Sleeger
Regional Environmental Officer
Pacific Northwest Region
500 NE Multnomah St., Suite 356
Portland, Oregon 97232
reopn@mindspring.com

h. Confederated Tribes of the Warm Springs Reservation of Oregon:

Brian Cunninghame
5520 Skyline Drive
Hood River, Oregon 97031
cunninghame@gorge.net

i. Confederated Tribes and Bands of the Yakama Nation:

Rose Longoria
Yakama Nation
Fisheries Management Program
P.O. Box 151
4690 SR 22
Toppenish, Washington 98948
rose@yakama.com

j. Confederated Tribes of the Grand Ronde Community of Oregon:

Michael Karnosh
Confederated Tribes of the
Grand Ronde Community of Oregon
47010 SW Hebo Road
Grand Ronde, Oregon 97347
Michael.Karnosh@grandronde.org

k. Confederated Tribes of the Siletz Indians:

Tom Downey
Environmental Specialist
Confederated Tribes of the Siletz Indians
P.O. Box 549
Siletz, Oregon 97380
tomd@ctsi.nsn.us

l. Confederated Tribes of the Umatilla Indian Reservation:

Audie Huber
Confederated Tribes of the Umatilla Indian Reservation
Department of Natural Resources
73239 Confederated Way
Pendleton, Oregon 97801
audiehuber@ctuir.com

m. Nez Perce Tribe:

Erin Madden
Cascadia Law, P.C.
4803 SE Woodstock, #135
Portland, OR 97206
erin.madden@gmail.com

XXXI. ADMINISTRATIVE RECORD AND PUBLIC COMMENT

96. EPA will determine the contents of the administrative record file for selection of the removal action. In accordance with this Settlement Agreement and the SOW, Respondents shall submit to EPA documents developed during the course of the EE/CA upon which selection of the response action may be based. Respondents shall assist EPA, as requested, before and during the comment period with its community relations activities concerning the EE/CA. At EPA's request, Respondents shall establish a community information repository at or near the GASCO Sediments Site, to house one copy of the administrative record. In accordance with 40 CFR §§ 300.415(m)(4) and 300.820, EPA will provide a public comment period of not less than 30 days on the

EE/CA, unless the Proposed Plan for the Portland Harbor Superfund Site is issued for public comment first. After considering public comments received, and reviewing additional data or analyses required to complete the EE/CA, if necessary, EPA may select a final removal action.

It is so Ordered and Agreed this 9th day of September, 2009.

By: Deb Yamamoto

Deb Yamamoto,
ECL Unit Manager
U.S. EPA, Region 10

Agreed this 2nd day of September, 2009.

For Respondent NW Natural

By: Margaret D Kirkpatrick

Margaret D Kirkpatrick
Printed Name

Vice President + General Counsel
Title

Agreed this 1 day of SEPTEMBER, 2009.

For Respondent Siltronic Corporation

By: _____

NEIL NELSON
Printed Name

PRESIDENT & CEO SILTRONIC CORP.
Title

STATEMENT OF WORK

Gasco Sediments Site
Portland Harbor Superfund Site
Portland, Oregon

1 INTRODUCTION

This Statement of Work (SOW) describes the work that shall be carried out by the Respondents (NW Natural and Siltronic Corporation) as they implement a final sediment remedy investigation, Engineering Evaluation/Cost Analysis (EE/CA) and design for the Gasco Sediments Site (Site) within the Portland Harbor Superfund site.[1] This SOW is attached to the Administrative Settlement Agreement and Order on Consent (Settlement Agreement) for the Site, and is incorporated as an enforceable part of the Settlement Agreement. This SOW is consistent with both the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP). Any discrepancies between the Settlement Agreement and SOW are unintended, but in the event of an inconsistency, the Settlement Agreement will control.

The project goal is the further characterization, studies, analysis, and design for a final remedy at the Site to facilitate construction of the remedial action to begin expeditiously following issuance of a Record of Decision (ROD) for the Portland Harbor Superfund Site. This action will include preference for removal of in-river materials containing "substantial product" (as defined in 3.6.2.1 of this SOW) such as Non Aqueous Phase Liquid (NAPL) and tar. It is anticipated that remedial action will be implemented under a consent decree following EPA issuance of the ROD. However, EPA reserves its rights and authority to order the Respondents to implement all or any portion of the necessary work under its removal or remedial order authorities.

This SOW describes the work to be conducted to meet the above project goal including:

- Section 2 – Project Context, which describes how the project fits into the other harbor-wide and Gasco site remediation activities and risk management principles that guide the work under the Settlement Agrement.
- Section 3 – Work to Be Performed, which describes the tasks to be performed and deliverables to be submitted as well as the Remedial Action Objectives (RAOs) for the project.
- Section 4 – Project Schedule for Major Deliverables, which describes the proposed schedule and dates for key activities.

2 PROJECT CONTEXT

This section describes conceptually how the project fits into the other harbor-wide and Gasco site remediation activities (programmatic sequence) and is not a substantive commitment or requirement of this SOW or the Settlement Agreement, nor is it intended to limit EPA's response or enforcement authorities, including determining the need for response action or the timing for same. The sequencing description is useful for understanding the overall project goal for the work under the Settlement Agreement. This section also describes risk management principles that will help guide the work under the Settlement Agreement. However, nothing in this Section is intended to change or modify the regulatory requirements for conducting an EE/CA analysis and developing and analyzing remedial alternatives under the NCP. New information may be learned or changed circumstances may lead to changes in the sequencing or the lead roles discussed below. Nothing discussed in Section 2 below creates a right or expectation that can be the subject of EPA enforcement or of dispute resolution under the Settlement Agreement.

2.1 General Project Area

As detailed in subsequent sections, the project area shall be determined in a series of evaluation steps that are intended to make the project area consistent with the Harbor-wide remediation. For discussion purposes, the general area under consideration for the Gasco sediments project is shown in Figure 1. Subareas of potential interest for the project in Figure 1 include areas where visible product is often but not always present (dark green), areas associated with bioassay toxicity (green), and areas above the Probable Effects Concentration (PEC; light green). There are no specific expectations with regard to remediation in any of these areas; rather, EPA and Respondents intend that remedial design for these areas will be consistent with the Harbor-wide Remedial Investigation and Feasibility Study (RI/FS) and Record of Decision (ROD), except as may otherwise be required under this SOW.

2.2 Programmatic Sequencing

The appropriate sequencing of remedial measures at the Gasco Sediments Site is critical to maximize the effectiveness of the overall Portland Harbor Superfund Site remedy and minimize the potential for recontamination. Four distinct phases of work under Oregon

Department of Environmental Quality (DEQ) and EPA direction are anticipated to occur in the following order (see Figure 2):

- Groundwater/Non-aqueous Phase Liquid (NAPL) Source Control (DEQ lead)
- Upland Remedial Action (DEQ lead)
- Gasco Sediments Site Final Sediment Remedy – Phased (EPA lead), design of which is the subject of this SOW
- Portland Harbor Remedy (EPA lead)

The groundwater/NAPL source control work needs to be completed first to prevent recontamination of any sediment remedy, and particularly sediment caps. Focused feasibility studies for the upland source control work have been completed, and a interim source control action is currently under design. The upland source controls will include a vertical barrier to NAPL migration and a groundwater extraction and treatment system. A NAPL extraction system may also be included in upland source controls, depending upon the findings of the planned NAPL Removal Pilot Program. These interim measures are expected to be part of an overall upland final remedy. Additional upland source control includes enhanced in-situ bioremediation for chlorinated volatile organic compound (CVOC) impacts in the Siltronic source area.

The Respondents will continue to work under DEQ oversight on upland source control actions related to the Gasco and Siltronic sites. The goal is for upland sources to be controlled to the greatest extent practicable before or during Site remedy implementation such that post remedy recontamination is not predicted and that in-water RAOs can be achieved.

The Gasco upland remedial investigation and risk assessment reports are currently being reviewed by DEQ and the upland feasibility study is in the preliminary planning phase. The upland feasibility study shall include evaluations of technologies and remedial alternatives to address upland soils, NAPL, groundwater, and stormwater. The remedial actions selected will be integrated with the Source Controls discussed above into an overall permanent remedy addressing all matrices and pathways posing risk at the Gasco and Siltronic upland sites. The goal is to implement the upland work prior to placement of the final Gasco sediment caps and dredge covers.

The Siltronic Focused Feasibility Study (FFS) for groundwater and transition zone water (TZW) impacted by CVOCs has been reviewed by DEQ (the supporting remedial investigation is still under review). It is Siltronic's goal that upland source controls for MGP-related groundwater and NAPL impacts will also, along with Siltronic's source area enhanced in-situ bioremediation, provide source control for the CVOC groundwater plume.

In the past, for the purpose of defining DEQ versus EPA-led work, the ordinary low water (OLW) line has generally been used at this site. Thus, remedial work in river bank soils above the OLW line is currently being evaluated in coordination with DEQ. For project-specific reasons, riverbank remediation construction will take place simultaneous with the Gasco Sediments Site construction so that a continuous fully integrated slope from Ordinary High Water (OHW) to permanently submerged sediments consistent with both riverbank and sediment designs can be constructed at one time with one set of river water quality protection measures. As such, for purposes of planning and efficiency, EPA shall oversee both the sediment construction and riverbank remediation work (top of bank riverward) as part of this SOW. EPA oversight of sediment construction and riverbank remediation work will: 1) extend from the river sediments up to the top of the bank slope ending where the generally level portions of the site begin; 2) result in a continuous fully integrated slope from the top of the riverbank to permanently submerged sediments; and 3) be constructed at one time with one set of river water quality protection measures consistent with both riverbank and sediment designs. The combined riverbank and sediment work will include one comprehensive ESA evaluation in consultation with NMFS (i.e., one biological assessment) that will cover both the sediments and riverbank removal or remediation work up to the top of the bank. The design will include evaluation of removal of sediments underlying the sloping portion of the bank, also known as the "wedge" area. In the event Gasco sediments construction does not proceed in a timely manner, the SOW does not limit DEQ's authority to include riverbank remediation in the uplands FS.

The Portland Harbor Remedial Investigation (RI) is almost complete and the and the Feasibility Study (FS) phase is beginning. A proposed final Gasco Sediments Site remedial

alternative shall be prepared so that it can be described in EPA's Proposed Plan for Portland Harbor. The Proposed Plan will describe the recommended Harbor-wide remedy and is subject to public comment and review. After public comment, the remedy decision will be documented in the ROD for the Portland Harbor Superfund site. Once the ROD is completed, further source control work will continue, and the remedial design and remedial action phase of work for Portland Harbor will start. One goal of this SOW is that the Gasco Sediments Site design shall be complete and ready for construction as the first or one of the first in a series of final sediment remedial actions throughout the Harbor. EPA retains its authorities to order work as a removal or remedial action.

The Gasco Sediments Site design will rely on the harbor-wide risk and FS information as it becomes available to develop a Gasco design that is consistent and fully integrated with the Harbor-wide remedy. Consequently, key points of information feed back between the harbor-wide process and Gasco Sediments Site action include:

- The harbor Draft Baseline Risk Assessment (BLRA) will be used to refine the Gasco Sediments Site cleanup areas for the Gasco EE/CA
- The harbor Draft FS, including remedial action objectives and preliminary remediation goals, will be used to develop the Gasco Sediments Site preliminary design alternative.

2.3 Risk Management Framework

This SOW's goal is to design a remedy consistent with the ROD that will reduce key human and ecological risks cost effectively given Site characteristics, which results in a cleanup that is protective of public health and the environment and meets all federal and state applicable and relevant and appropriate requirements (ARARs). The risk lines of evidence used in the ROD will guide risk management for the Gasco Sediments Site. The design will also use a risk management framework consistent with EPA guidance (EPA 2005 and EPA 1988) on developing sediment remedies and specifically recognizes the risk management goals for the project throughout the evaluation and design process. The risk management related approaches that are specifically important to this project and are consistent with guidance include:

- The Gasco Sediments Site clean up boundary will be consistent with Portland Harbor EPA approved BLRA.
- Evaluate remedial alternatives with regard to total net risk reduction within the overall framework of the NCP remedy selection criteria.
- Use the Portland Harbor risk assessment protocols, procedures, data, and outcomes whenever possible to set clean up boundaries and evaluate risk reduction, unless use of these would cause an unacceptable delay to the Gasco Sediments Site remediation.
- Evaluate alternatives for long term effectiveness for a range of technologies including dredging, capping, and Monitored Natural Recovery (MNR).[2] Alternatives will include combinations of technologies that are tailored to the physical, chemical and other conditions of the Site.
- Evaluate the short term risks (i.e., sediment resuspension, water borne releases, and dredge residuals) posed by different dredge methods (i.e., hydraulic and clam shell) and the installation and removal of various containment systems (i.e., sheet pile and coffer dam).
- Because the level of some of the risk is related to biota exposures, evaluate migration pathways, bioavailability, and future exposure (e.g., sediment stability under various river current and vessel propeller scour conditions) when predicting risk reduction.
- Evaluate future exposures and risks potentially posed by the presence of potentially mobile product in sediment.
- Preference for removal of "substantial product" as defined in Section 3.6.2.1 of this SOW from the project area for offsite disposal, where consistent with the other risk management framework approaches.

Remedial alternatives analysis will be conducted using the 9- criteria contained in the NCP in the EE/CA analysis. Some of the issues, but not all, that will be considered in developing the remedial alternatives are:

- Slope stability issues
- Variations in physical conditions from shorelines to deep navigation channels

[2] It should be noted that MNR refers to known, ongoing, naturally occurring processes to contain, destroy, or otherwise reduce the bioavailability or toxicity of contaminants in sediment. MNR for sediment includes solids and dissolved phase changes in concentrations over time (e.g., bulk sediment and TZW or porewater). In relation to groundwater or in-river TZW this process is sometimes referred to as attenuation.

- Construction will need to take place in and around existing operating docks
- Neighboring future water dependent uses such as U.S. Moorings' docks and Siltronic's process water discharge outfall, including the potential need for temporary outfall relocation during construction and replacement
- Accommodating FAMM/Koppers dock usage during construction
- Flood impacts and floodway analyses relative to potential alternatives
- Substantive requirements of the Endangered Species Act (ESA), Clean Water Act, other Applicable or Relevant and Appropriate Requirements (ARARs), etc.
- Navigation requirements including federal navigation channel issues and private future navigation requirements for transport and docking
- Overlap and integration of riverbank source control measures and remedial actions

Dock removal is not preferred by NW Natural under this SOW due to its impacts on business operations, and this option is not expected to be cost-effective as defined and evaluated consistent with the EE/CA process. However, the cost effectiveness of potential dock removal and/or limiting dock usage during construction will be fully evaluated and considered in the project EE/CA. This will include evaluation of alternatives that consider the full costs of dock replacement, potential limits on dock usage, and the costs of lost business resulting from those alternatives. Also, the EE/CA will include a comparison of the short term and long term effectiveness of remedial alternatives that include dock removal or limited usage to those that do not.

3 WORK TO BE PERFORMED

This section describes the work to be performed under the Settlement Agreement as well as RAOs, key decision factors, and criteria that will govern project work.

3.1 Ongoing Coordination

The Respondents shall coordinate meetings and/or teleconferences with EPA, DEQ, the Tribes, and the Natural Resource Trustees to discuss the status of work described in this SOW. After approval of the Work Plan (see Section 3.3), such meetings shall be monthly, if needed. DEQ, the Tribes, and the Trustees will submit their comments to EPA. EPA will provide the comments to Respondents that Respondents are to address. To coordinate with upland source control actions on the Gasco and Siltronic sites, the Respondents shall coordinate quarterly meetings with EPA and DEQ and/or written updates shall be provided in place of such meetings. Consistent with the February 2001 Memorandum of Understanding, DEQ will provide upland source control documents to EPA for review, to ensure consistency and compatibility with the contemplated in water dredging and cap designs for recontamination analysis.

3.2 Remedial Action Objectives (RAOs)

Because the goal of this project is to design a final remedial alternative that can be included in the Portland Harbor Proposed Plan, the RAOs shall be consistent with the RAOs being used for the wider Portland Harbor site. Consistent with current Portland Harbor RAOs, the project action objectives for final remedial design at the in-water portion of the Gasco site are:

1. Removal of sediments containing substantial amounts of product (e.g., solid "tar" and/or NAPL) that may serve as potential future source of risk material, unless it can be shown that the costs of such removal are clearly disproportionate to the degree of risk reduction to be attained through physical removal as compared to other remedial options for the same material. "Substantial" is defined in Section 3.6.2.1 of this SOW.
2. Reduce human health risks to acceptable levels from direct contact with and incidental ingestion of chemicals of concern (COCs) in Site sediments.

3. Reduce COC concentrations in Site sediments to levels that would result in acceptable risks to humans that eat fish and shellfish from the harbor in the absence of other sources of chemicals in the river.
4. Reduce COC fluxes from Site sediments such that human health risks would be at acceptable levels for direct contact with and incidental ingestion of Site surface water in the absence of other sources of chemicals in the river.
5. Reduce ecological risks to acceptable levels from contact with and ingestion of COCs in Site sediments or prey from the Site in the absence of other sources in the river.
6. Reduce COC fluxes from Site sediments such that ecological risks would be at acceptable levels for direct contact with and ingestion of Site surface water in the absence of other sources of chemicals in the river.
7. Reduce the migration of contaminants at unacceptable levels from the Site to the Willamette River.
8. Reduce COC fluxes through Site sediments so that recontamination of Site sediments to unacceptable levels does not occur.

Definitions of terms such as "reduce risks" and "acceptable levels" shall be consistent with the Portland Harbor RI/FS Work Plan or as modified by the harbor-wide RI/FS process. Likewise, if through the RI/FS process, the RAOs for the Portland Harbor site are changed or revised, RAOs for this project shall be revised. Chemicals of Concern (COCs) are defined as those chemicals related to historical and present Site sources that are found to pose risk at the Site following methods consistent with the Portland Harbor BLRA. The final Portland Harbor ROD will select performance standards and cleanup levels based on protectiveness and compliance with applicable and relevant and appropriate requirements (ARARs).

The Portland Harbor FS will consider "background" following EPA guidance (EPA 2002a) on the use of background in RI/FS evaluations and other relevant EPA Superfund guidance.

Removal of significant amounts of product in sediment is expected to minimize the potential risks over the long term as described by RAO #1. However, it should be noted that removal of all product in sediments is not necessary to meet this objective and may not be technically feasible given practical limitations of sediment removal, which will be further evaluated as described in 3.6.2.1. None of the above precludes the evaluation or selection in

the EE/CA of removal options for sediments that do not contain substantial amounts of product. Removal may be a cost effective alternative (as determined in the EE/CA) for various types of Site sediments.

RAO #7 and 8 relate to preventing recontamination of the Site from upland or other sources. In addition, it should be recognized that recontamination from potential harbor wide sources must also be evaluated in the project EE/CA and design documents. These potential sources include ongoing upland sources from other upstream and nearby sites as well as potential sources from upstream sediment remediation (particularly dredging) projects. The EE/CA and design documents will address the appropriate sequencing of Site construction and Gasco and Siltronic source control activities with these potential harbor-wide sources such that recontamination of the Site remedy is prevented. Such sequencing will be consistent with the findings of the Portland Harbor FS, Proposed Plan, and ROD, to the extent possible, recognizing that the Gasco Sediments Site represents a potential recontamination risk to other downstream sites. Cleanup alternatives may include sequencing Site construction in whole or part, dredging earlier and waiting to place a permanent cap, or other sequencing to prevent recontamination consistent with upstream and nearby source controls and sediment remediation timelines. Such sequencing will be consistent with the findings of the Portland Harbor FS, Proposed Plan, and ROD to the extent this is available in a timely fashion. EPA will oversee both the sediment and riverbank work as part of this SOW with riverbank work being defined as the bank area up to the top of the bank slope and ending where the generally level portions of the site begin. This work shall include evaluation of removal of sediments underlying the sloping portion of the bank, also known as the "wedge" area.

The above RAOs shall apply within the boundary determined for the project. Establishment of that boundary within the wider Portland Harbor sediment cleanup is discussed more in Section 3.6.2.9.

3.3 Work Plan

The Work Plan shall be submitted in accordance with the schedule contained in Section 4.

The Work Plan shall provide a more detailed description of work to be conducted for the project consistent with this SOW. The Work Plan shall contain at a minimum the following information:

- Introduction/Purpose
- A review and presentation of existing information (as detailed more below)
- A summary of each of the work tasks consistent with this SOW
- Procedures to protect and address cultural resources consistent with the cultural resources surveys conducted for the Harbor by the Lower Willamette Group (LWG) and for the Gasco site specifically by NW Natural for the previous tar removal action conducted in 2005
- A description of the analysis to be conducted to determine disposal facility or containment options for contaminated sediment
- Increased specificity of the Section 3.2 RAOs, if needed. This will include any necessary refinement of project action objectives stated in Section 3.2. The intent is that the objectives in Section 3.2 shall govern the work, so minimal refinement is expected and shall focus on the addition of means and methods of RAO measurement, as needed.
- Identification of potential Applicable or Relevant and Appropriate Requirements (ARARs), and To Be Considered (TBCs) for the Site
- A schedule for completion of all project tasks per Section 4, with additional details as needed to describe the work timeline
- A process and schedule showing how these SOW tasks fit into the upland source control program such that the sequence of activities discussed in Section 2.1 shall be achieved
- Other information (including maps and figures) necessary to gain a general understanding of the Site.

The Work Plan shall also outline the process for engaging partner agencies on a timely basis to ensure that substantive requirements are met consistent with partner agency interpretation of those requirements. Of particular importance is Endangered Species Act (ESA) compliance with National Marine Fisheries Service (NMFS). The Work Plan shall address key points for engaging NMFS on detailed reviews of project material including:

- Immediately prior to EE/CA development

- EE/CA review including specific input on the evaluation and selection of preferred alternative and a Biological Assessment (BA) of the preferred alternative
- Preliminary Design review including a revised Biological Assessment (BA) based on EE/CA level BA comments
- Interim Design review including any updates to BA determinations as appropriate.

The Work Plan description of existing information will not be a comprehensive data report, and it will rely on original reports from LWG, Siltronic and NW Natural for detailed information, as needed to conduct investigations and design. Important figures, tables, and overall data summaries shall be included in the Work Plan as necessary to illustrate known information and data gaps. The existing information description shall include:

- Brief description of the Site characteristics, including ecological and physical characteristics as well as human land use (e.g., any recreational and/or transient use of beaches).
- Summary of historical and ongoing sources of contamination to the Site, including past and present operations, drainage, discharges, groundwater plumes, groundwater seeps, or other releases.
- Summary of existing information on upstream and upland contamination sources that have the potential to contaminate the Site, including a description of environmental investigations, environmental cleanups and planned upland source control measures that are being conducted under agreements with DEQ as the lead agency. The summary of upland source control measures being conducted shall contain the most recent version of the schedule for implementation and completion as negotiated by DEQ and NW Natural and Siltronic.
- Summary of site historical information including dredging history and identification of past and present property owners, operators, and major tenants as well as owners and operators of all immediately adjacent upland properties.
- Summary of current facility operations and potential access or operational constraints on Work Plan implementation.
- Summary of nature and extent of contamination, sediment toxicity testing, and biota sampling at the Site, to the extent known, including chemical/toxicity information relevant to the remedy. This will be an initial summary, and more detailed mapping including comparison to screening levels shall be conducted for the Project Area

Identification and Data Gaps QAPP discussed in Section 3.4. Existing chemistry data will be reviewed to establish Category 1 and Category 2 data categories in accordance with the Portland Harbor RI/FS protocols.

- A conceptual site model showing the relationship of the contaminant plumes starting in the uplands and continuing through the riverbank, and into sediment in the river, to the full extent of the data available at the time of submittal. This shall include mapping of VOCs associated with Siltronic soil, groundwater, and sediment impacts and overlap with MGP related soil, groundwater, and sediment impacts.
- Upon request by EPA, Respondents shall also submit copies of previous studies or sampling efforts conducted independently or under local, state or other federal authorities or agreements that are determined by EPA to relate to remedy selection under the Settlement Agreement.

The COCs to be reviewed and mapped in existing information summaries and conceptual site models for the Work Plan shall be based on the COC lists for upland Gasco and Siltronic site source controls as well as those chemicals currently being identified as COCs for this region of the Harbor for the harbor BLRA. The BLRA COC list for this region of the harbor shall be refined during the course of the Gasco Sediments Site work. Based on the current status of this work and upland Gasco and Siltronic source control COC lists, COCs to be reviewed and mapped in the Work Plan are currently expected to include:

- Benzene, toluene, ethylbenzene, xylenes (BTEX)
- Polynuclear Aromatic Hydrocarbons (PAHs)), extended to include 2-methylnaphthalene, dibenzofuran, and carbazole
- Cyanide (including total cyanide in sediment and total, available, and free forms in water samples)
- Zinc
- Trichloroethene (TCE)
- Cis-1,2-Dichloroethylene (cis-DCE)
- Trans- 1,2 Dichloroethylene (trans-DCE)
- 1,1 Dichloroethylene (1,1-DCE)
- Vinyl chloride
- PCBs

- DDTs
- DDDs
- DDEs
- Diesel range hydrocarbons
- Residual range hydrocarbons
- BHCs
- Endrin Ketone

This nature and extent mapping shall also include mapping of product observations including tars and oils. Conceptual site model plume mapping shall be limited to a subset of COCs that represent the greatest risks and/or extent of chemicals associated with the Gasco Sediments Site. A rationale for selecting this subset of COCs for conceptual site model mapping shall be presented in the Work Plan based on this existing chemistry data review. While only COCs posing the greatest risk will be depicted in the work plan, for the purposes of performance standards measurement later in the cleanup process, the full list of COCs shall be utilized.

3.4 Project Area Identification Report and Data Gaps QAPP

The Project Area Identification Report (AIR) and Data Gaps Quality Assurance Project Plan (QAPP) shall be submitted to EPA in accordance with the schedule contained in Section 4. The purpose of this document is to build upon the existing information summary in the Work Plan to:

- set the project boundaries based on a risk framework consistent with the Portland Harbor RI/FS process (Section 3.4.1)
- identify any data gaps (Section 3.4.2) relevant to refining project boundaries, conducting the EE/CA per Section 3.6, and conducting the Design per Section 3.7.
- describe field sampling, analytical, and quality control/quality assurance (QA/QC) procedures for filling identified data gaps (Section 3.4.3).

3.4.1 Project Area Identification

3.4.1.1 Overview of Iterative Project Area Identification Process

The project area shall be identified in an iterative fashion through the course of data gathering, alternatives evaluation, and design. The initial project area identification

shall be based on currently available lines of evidence from the Portland Harbor RI/FS and presented in the AIR. This version of the boundary will be used to help identify the preliminary lateral and vertical extent of the project cleanup area as well as data gaps.

An interim refined cleanup area identification shall be determined after the lines of evidence are finalized in the Portland Harbor RI and BLRA. The interim area shall be presented in the Gasco Sediments Site EE/CA following methods discussed in Section 3.6. This refined boundary shall be used to refine lateral and vertical extent for the evaluation of remedial alternatives. Internal subareas within the boundary will be considered to help in the identification of combination alternatives within the overall area (e.g., capping in one subarea vs. dredging in another subarea).

A proposed final project area shall be determined after the Portland Harbor FS is available and this proposed final area shall be presented in the Gasco Sediments Site Preliminary Design as described in Section 3.7. The proposed final project area boundary shall be used for the basis of remedial design and identified for inclusion in the EPA Portland Harbor Proposed Plan. The final ROD RAOs shall also apply to this proposed final project area.

Identification of a final project area under the Settlement Agreement and SOW may not represent the boundary where all releases of hazardous substances from the Gasco and Siltronic facilities have come to be located within the Portland Harbor Superfund Site. Additionally, the project area under this Settlement Agreement and SOW may not address all remedial actions determined to be necessary from releases from Gasco and Siltronic facilities in the ROD.

3.4.1.2 Initial Project Area Identification for the AIR

At the present time the Portland Harbor BLRA and FS are not completed and they will not be available at the expected time of the initial or interim Gasco AIR development. To help identify data gaps in the AIR, the following preliminary lines of evidence will be used to develop preliminary lateral and vertical extents for the cleanup:

- The lateral and vertical extent of significant volumes of NAPL and tar product in sediment.
- The use of currently available lines of evidence to evaluate where unacceptable risk exposure may be identified in the Portland Harbor ROD, but where significant volumes of NAPL and tar product are not present.
- The use of currently available lines of evidence for Portland Harbor baseline and/or background conditions.

Consistent with the available harbor BLRA lines of evidence the nature and extent of contamination shall be presented and mapped in the AIR. This summary of existing bulk sediment, TZW, riverbank soils, and water media chemistry shall be compared to ecological and human health screening levels consistent with the in-process harbor BLRA and RI/FS, including but not limited to:

1. Existing ecological sediment quality guidelines that are or will be used in the Portland Harbor BLRA that represent a range of levels including, but not limited to, low or no effects levels as well as levels at which some effects are expected.
2. Estimated sediment Preliminary Remediation Goals (PRGs) from the Portland Harbor RI/FS process for persistent bioaccumlative toxins (PBTs) that are protective of humans and wildlife that consume aquatic biota from the Willamette River
3. Estimated sediment PRGs from the Portland Harbor RI/FS process that are protective of humans from direct contact with and incidental ingestion of COCs in sediments.
4. Estimated water PRGs and screening levels from the Portland Harbor RI/FS that are protective of ecological receptors and human health from direct contact with and ingestion of water media. These include but are not limited to those values currently under consideration for Portland Harbor screening values including: human health and ecological ambient Water Quality Criteria (WQC), residential tapwater SLVs from EPA's Regional Screening Level Tables, and Drinking Water Maximum Contaminant Levels.
5. Conservative water screening levels or, if available, estimated PRGs or management goals from the Portland Harbor RI/FS that are protective of receptors related to groundwater plumes.

All screening values and estimated PRGs used shall be reviewed and approved by EPA before their use. Existing data should be plotted on site maps. Locations with concentrations above the screening levels and estimated PRGs identified above should be indicated on these maps.

It is fully recognized that this initial set of parameters will be used as a starting point for the later project area refinements for the EE/CA and final project area identification for the design. As additional information from the Portland Harbor RI/FS becomes available more detailed project area definition shall be conducted and the area, and any sub-areas within it, shall be refined.

3.4.1.3 River Bank Remedy and Source Control Areas and Volume Determination for AIR

The riverbank is included in the project area to facilitate consistencies between riverbank remediation, source control work and the in-river sediment cleanup. The need for riverbank work shall be determined by:

1. the need for soils remediation consistent with the upland risk assessment and upland FS
2. the need to control sources of contaminants from the riverbank to the river including
    a. processes of soil erosion,
    b. leaching of chemicals due to shallow groundwater movement through the bank,
    c. and/or stormwater infiltration and discharge through riverbank soils.

The process for determining the work needed in the river bank areas and volumes that are included in the project are described more in Section 3.6.2.10. For the preliminary determination of areas and volumes to be included in the AIR, existing data that extends landward up to (but not beyond) the top of bank (as defined in Section 2.2) shall be reviewed. This area shall also be included in the data gaps identification (Section 3.4.2). Any data or known determinations consistent with soil remediation and source control actions that extends landward of the top of bank

shall not be included in the AIR or subsequent EE/CA. Such data and activities will be included in the DEQ determinations for uplands source controls and remediation. Although this riverbank area will be included in the AIR there may not be a need for remediation or source controls along all portions of the riverbank. The areas of riverbank that require remediation or source controls shall be identified in the Interim Area Identification (Section 3.6.2) portion of the EE/CA and Data Report (Section 3.6).

The application of the in-river lines of evidence discussed in 3.4.1.2 were not developed for use in preliminary project area identification when applied to riverbank soils.

3.4.2 Identify Data Gaps

The AIR and Data Gaps QAPP shall review existing information used to define the project boundary per Section 3.4.1 and then identify any data gaps that shall be filled by the collection and analysis of field samples relevant to conducting the EE/CA per Section 3.6, conducting the Design per Section 3.7, and refining the project area boundary for both the EE/CA and Design per the iterative approach described in Section 3.4.1.1.

More specifically, data gap identification shall focus on problem definition and shall result in collection of data of adequate quality and technical content to:

- Determine spatial and volumetric extents of contamination
- Refine the project boundary
- Evaluate remedial alternatives on a consistent basis in the EE/CA
- Prepare project designs
- Evaluate potential human health and ecological risks consistent with the Portland Harbor BLRA lines of evidence resulting from exposure to sediment, transition zone water, riverbank, groundwater, surface water and biota contamination
- Evaluate recontamination potential to the Site by (1) riverbank and in water contaminated sediments and water media outside of the Site and (2) upland sources of contamination

- Determine engineering characteristics of the Site sediments including consistency, dredgeability, potential slope stability issues related to dredging, and potential sediment consolidation issues associated with capping
- Evaluate potential water quality effects associated with dredging, piling removal, sheet pile installation, capping, or disposal technologies
- Evaluate technologies for sediment remediation including capping, dredging, treatment, including any necessary treatability testing, and disposal (on-site and off-site)
- Evaluate technologies for TZW remediation
- Evaluate potential impacts to threatened or endangered species, other biological receptors, and the potential habitat benefits and impacts of the remedy.

Data gaps identification shall fully consider data collected by NWN and Siltronic in addition to evaluations conducted by the LWG for the Portland Harbor RI/FS, which will be particularly relevant to issues of contaminant levels in sediment, biota, surface water, and transition zone water; recontamination potential; sediment dredgeability and consolidation potential; water quality effects, treatability testing; and biological impacts.

Although the intent is to collect all data needed to complete the project, once the preferred alternative(s) is selected via the EE/CA, there may be a need for some additional specific data collection to support design work.

Although other data gaps may be eventually identified and all data needs are subject to confirmation in the data gaps analysis, based on preliminary reviews of existing data, it appears the following types of data needs could be identified:

- Given that substantial spatial gaps exist for existing sediment bioassay data in some potential project areas and sediment bioassays are a strong line of risk evidence, collection of additional sediment bioassay data to refine the project boundary in the iterative process discussed in Section 3.4.1.1.
- Bulk sediment chemistry would be needed at least at bioassay locations and may also be an independent data need to fill spatial or volume gaps.
- Coring for visual observations of NAPL/product in key areas to fill spatial or volume data gaps.

- Possible geotechnical or chemical mobility (e.g., leachate, elutriate, or other tests) testing to support EE/CA alternatives evaluation and/or design.

Another specific characterization data gap that shall be considered is the extent of existing chemistry information under the docks and the potential need for additional information there.

Because of the difficulty sampling under docks, this has generally not been undertaken by the LWG or NW Natural. Existing assumptions are that chemistry and product levels under the docks are similar to those areas immediately adjacent, which have been sampled on both the riverward and shoreward (i.e., behind the dock) sides of the docks. This assumption shall be further evaluated to determine the extent to which it might impact EE/CA decisions if it were wrong. Where it appears EE/CA decisions could be substantially altered (see below), there may be a need for select sampling underneath the dock to confirm/refute this assumption.

Defining spatial/volume data gaps shall not rely on any specific statistical or spatial evaluation techniques, although these may be considered. The overall objective driving spatial gap identification is whether or not inclusion of the additional spatial information could reasonably change the selection of the preferred alternative in the EE/CA. This can be gauged by estimating changes in defined areas and volumes (using methods defined in Section 3.4.1.1) that would be provided by additional data and relating those changes to general unit cost estimates (e.g., for dredging, capping, etc.).

3.4.3 Data Gaps QAPP

The procedures the Respondents plan to implement when conducting all field activities shall be detailed in the Data Gaps QAPP. The QAPP shall ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols that data meet data quality objectives (DQOs). The QAPP provides DQOs and methods for meeting those objectives and contains a Field Sampling Plan (FSP), which describes procedures for planning and executing field activities. Respondent shall also prepare a HASP that is designed to protect personnel from physical, chemical and other hazards posed by field sampling efforts.

The Data Gaps QAPP shall define site-specific DQOs and detail methods and QA/QC procedures for collecting and analyzing samples needed to fill the data gaps identified through the process described in Section 3.4.2. The QAPP shall also describe the personnel, project organization, data handling, data validation, and database development procedures. The QAPP shall describe the quality assurance and quality control protocols necessary to achieve required data quality objectives. The QAPP shall be prepared in accordance with Section 3.9.

The Data Gaps FSP shall define in detail the sampling and data-gathering methods that will be used for the design characterization. It shall include sampling objectives, a detailed description of sampling activities, sample locations, sample analysis, sampling equipment and procedures, sampling schedule, station positioning, sample handling (e.g., sample containers and labels, sample preservation), and chain of custody procedures.

The Data Gaps HASP shall be prepared in accordance with Section 3.9.

3.5 Data Collection and Reporting

Data shall be collected and reported consistent with the AIR and Data Gaps QAPP described in Section 3.4.3. The data collection, analyses, data validation, database development shall be conducted per the schedule in Section 4. Data shall be reported in the EE/CA.

Upon request by EPA, EPA or its authorized representatives may take split and/or duplicate samples. Respondents shall notify EPA not less than 14 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA may take any additional samples that EPA deems necessary. Upon request, EPA will allow Respondents to take split or duplicate samples of any samples EPA takes as part of its oversight.

3.6 EE/CA and Data Report

The EE/CA and Data Report shall be submitted in accordance with the schedule contained in Section 4. This report shall contain an evaluation of potential cleanup alternatives

consistent with EPA guidance on EE/CAs. The EE/CA shall include a development and evaluation of alternatives as well as a thorough evaluation of all criteria considered under an FS. This is consistent with the goal of including the preferred alternative design in the Portland Harbor Proposed Plan. Based on data obtained in the previous sampling efforts and work to be performed under this SOW, and in consideration of EPA's guidance for RI/FS and EE/CAs, Respondents shall prepare a technical briefing for EPA, DEQ, the Tribes and the Trustees on the proposed removal alternatives that will be presented by Respondents in the EE/CA. After the technical briefing, Respondents, in consideration of comments received at the technical briefing, shall submit a first draft of the EE/CA.

If the Portland Harbor RI/FS and Proposed Plan process is sufficiently on schedule to meet the desired sequence of activities as discussed in Section 2.1 and shown in Section 4, then public comment on the Site remedy will occur as part of the Portland Harbor Proposed Plan public comment process. Given the currently envisioned schedule, information from the Site remedy could be incorporated into the Proposed Plan at a design level of detail (either interim or final design depending on the exact timing of the Proposed Plan).

If the Proposed Plan is not ready within a reasonable time following preliminary approval of the EE/CA, then the preliminarily approved version of the EE/CA may be released by EPA for a formal public comment period. Under this scenario, a public comment period of at least thirty (30) days would be required for the EE/CA and the administrative record.

Under either public comment process, Respondents shall assist EPA, as requested, before and during the comment period with its community relations activities concerning the EE/CA or harbor Proposed Plan, as it specifically relates to issues on this Site. Respondents shall also assist EPA in compiling the Administrative Record before and during the public comment period. If, based on public comments received, EPA determines additional data or analyses are required to complete the Site remedy EE/CA or design, Respondents shall collect such data, or perform such analyses, as determined necessary by EPA.

3.6.1 Contents

The EE/CA shall contain the following:

- Executive Summary

- Introduction
- A project area characterization including Interim Project Area Identification (as detailed in Section 3.6.2), which shall be a refinement of the AIR based upon the data gaps information collected per Section 3.5 and the results of the Portland Harbor BLRA.
- The result of the analysis regarding the remedy recontamination potential of the Site by (1) riverbank and in water contaminated sediments and water media from outside of the Site and (2) upland sources of contamination including whether source control actions will be sufficient or if additional actions may be required to control potential sources of significant recontamination
- Identification of ARARs
- Procedures for addressing and protecting cultural resources during the Site remedy
- Refinement of RAOs, as necessary
- Identification, analysis, and screening of remedial technologies including water quality controls
- Assembly of screened technologies into combined cleanup alternatives
- Screening of combined cleanup alternatives
- Identification, analysis, and evaluation of combined remedial alternatives including:
    - the identification and analysis of disposal facility or containment options
    - incorporating the costs of any remedial action
    - any proposed institutional controls
    - detailed assessment of screened cleanup alternatives against evaluation criteria
    - Individual detailed evaluation of each alternative
    - Comparative detailed evaluation of alternatives
- Recommended remedial alternative(s), including the selection of any needed disposal facility
- An assessment of the residual risk anticipated after the remedial action implementation
- Schedule for recommended remedial action

- Preliminary drafts of the Biological Assessment (BA) and Clean Water Act analysis memorandum for the recommended remedial action alternative
- An Appendix that shall contain the formal data report for all the data collection in Section 3.4 including data evaluations and discussions that support EE/CA evaluations.

Disposal options for dredged material shall be limited to off-site disposal facilities. The type of facility shall be guided by testing procedures presented in Section 3.6.2.1. Per RAO #1 in Section 3.2, substantial product shall be removed unless it can be shown that the costs of such removal are clearly disproportionate to the degree of risk reduction to be attained through physical removal as compared to other remedial options for the same material.

The alternatives analysis shall consider the following evaluation criteria:

- Overall Protection of Human Health and the Environment
- Compliance with ARARs
- Long-Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility, or Volume Through Treatment
- Short-Term Effectiveness
- Implementability
- Cost

The additional criteria of State Acceptance and Community Acceptance are evaluated by EPA after the public comment period.

The alternatives development and evaluation process shall also consider the following technical issues:

- Shoreline slope stability limits
- Dock stability limits
- Measures that may need to be taken to remove material existing under the dock
- Dock access limitations as they relate to scheduling of work
- Navigation channel depths and requirements
- Other Navigation limitations and reasonably anticipated future site uses (e.g., dock access Koppers, FAMM, and US Moorings)

- Floodway evaluation and limitations.

3.6.2 Interim Project Area Identification

The Portland Harbor RI and Risk Assessment information, if approved by EPA, shall be used to refine the preliminary project area defined in the AIR into an interim project area for the purposes of the EE/CA as described in Section 3.4.1.1. Specific criteria based on the Portland Harbor risk information shall be used to develop the interim project area, and later the final project area for the design. This information shall also be used to identify the sub-areas to assist in evaluation of combination alternatives in the EE/CA. The expected risk information to be used in project boundary and sub-area refinement for the EE/CA is defined in the following subsections.

3.6.2.1 Substantial Presence of Product

Areas with substantial presence of product in sediments is a line of evidence related to potential mobility of chemicals in the future, and thus related to risks identified in the BLRA. Visual observations in sediment cores shall be the primary parameter used for this line of evidence. As noted above, the term "substantial" product is intended to 1) target product that is related to potential future mobility and 2) indicate a preference for removal as defined by RAO #1. The definition of substantial product does not include every incidence of product observation at the site. Based on core observations, the working definition of "substantial presence of product" is those sediments that meet the following criteria:

1. Bands of product, layers of product, "saturated" sediments, "stained" sediments, and/or seams of product that are greater than 2 inches thick.
2. Any layer or seam of product, regardless of thickness, that is clearly defined as liquid NAPL that is also mobile (i.e., "oozes" or "drips" out of the core during core observations).

Modifying factors to this definition are:

3. If top 5 ft of core has no substantial product under Criteria #1, then deeper product should be judged as "not substantial", even if relatively thick layers of product exist at greater depths.

4. If there are any seams of mobile liquid NAPL (not solid or semisolid tar) per Criteria #2 then this is substantial product regardless of depth and the characteristics of overlying sediments.

The following is NOT substantial product:

- Any layers of non-mobile product (i.e., bands, layers, saturated sediments, stained sediments) that are less than 2 inches thick.
- Petroleum odors that are not associated with visual evidence of product beyond sheens and blebs.
- Sheens that are not associated with more substantial visuals of product
- Isolated product blebs or spots not associated more substantial visuals of product

Criteria 3 shall consider whether the 5 feet of overlying relatively clean material includes any sediment that would be expected to be removed as part of Army Corps maintenance dredging in the navigation channel. If so, the 5 ft depth requirement should be judged from the depth to which maintenance dredging would occur. The edges of the area with "substantial presence of product" shall be defined by cores which do not contain substantial product. Examples of product containing cores that meet the definition of "substantial product" and examples of cores that do not meet this definition are shown in Figure 3.

Also, as noted in RAO #1 in Section 3.2 substantial product shall be removed unless it can be shown that the costs of such removal are clearly disproportionate to the degree of risk reduction to be attained through physical removal as compared to other remedial options for the same material. If substantial product will not be removed, it must be shown that alternative approaches are substantially less costly as well as equally if not more effective at meeting all of the other RAOs, particularly those that relate to creating acceptable sediment risk and preventing downstream migration of contaminants.

3.6.2.2 Benthic Toxicity Bioassays

Bioassay locations exhibiting toxicity shall be considered to be within the project boundary consistent with Portland Harbor criteria for evaluation of bioassays. Bioassay results shall be directly interpreted by sampling location to help define areas of sediments.

3.6.2.3 Benthic Toxicity Models

The models may provide sediment chemical concentrations at which benthic toxicity can occur that can be applied directly to project sediment chemistry data. Toxicity model definitions and sediment chemical thresholds defined by the Portland Harbor process shall be used.

3.6.2.4 Human Health Shellfish Consumption

The chemical concentrations in shellfish tissue expected to cause human health shellfish consumption risks shall be used in the Portland Harbor BLRA to back calculate target sediment concentrations via biota sediment accumulation factors (BSAFs). Areas above target sediment concentrations can be mapped based on these calculated sediment thresholds. A wide range of sediment thresholds are possible based on varying exposure scenarios (i.e., shellfish consumption rates), cancer risk levels, and BSAFs. The range of thresholds and a reasonable number of increments along that range will be mapped.

3.6.2.5 Human Health Direct Sediment Exposures

Sediment concentrations expected to cause direct contact human health risks shall be determined for the BLRA and can be directly used to determine sediment areas posing risk via this pathway.

3.6.2.6 Sediment Probable Effects Concentrations (PECs)

These existing sediment guidelines shall be used in the BLRA and can be applied directly to Gasco sediment data to map sediment areas associated with potential benthic risks.

3.6.2.7 Portland Harbor "Baseline" PAH Levels

This may be important to the determination of project boundary as it relates to some types of low level diffuse contamination occurring within and around the Site, but not necessarily related to the Site.

3.6.2.8 Groundwater Plume Concentrations

TZW concentrations in groundwater plume areas shall be screened in the BLRA against water quality criteria and areas that exceed this screen or a similar screening conducted on more recent data may be included in the interim project area. When remedial action objectives and performance standards for groundwater plume areas are developed for the Harbor FS, these shall be used for interim project area identification.

3.6.2.9 Other Potential Lines of Evidence

Several lines of evidence are currently under consideration for the Portland Harbor BLRA process but their use has not been determined in that process. The findings of the Portland Harbor Round 2 Report and current expectations for the BLRA are that Polyaromatic Hydrocarbons (PAHs) and Volatile Organic Compounds (VOCs) do not cause substantial risks in fish consumption pathways. In the event that this finding changes with the completion of the BLRA, this line of evidence may be revisited to refine the project boundaries for the EE/CA.

Lines of evidence shall be evaluated in a manner consistent with the Harbor-wide process.

3.6.2.10 Riverbank Remedy and Source Control Determination

As discussed in Section 3.4.1.3, riverbank soils shall be included in the project area definition to the extent that river bank soils require remediation consistent with the uplands risk assessment and uplands FS and/or require control of sources from river bank soils to the river. In addition, where the need for such actions extends landward of the top of bank as defined in Section 2.2, these actions shall be included in the DEQ determinations for uplands source controls and remediation and not included in the sediment interim project area definition or subsequent sediment

EE/CA evaluations or design. Sediment based risk measures otherwise described in Section 3.6.2 are not appropriate for application to river bank soils.

The following remedial approaches are expected to be preferred to address each of the upland remedial and riverbank source control needs discussed in Section 3.4.1.3, although other remedial approaches may be evaluated in the EE/CA:

1. Combinations of removal and capping for areas requiring soil remediation.

2a. Stabilization for areas requiring control of soil erosion source control

2b. Control and/or diversion of shallow groundwater from entering the riverbank for areas requiring groundwater source control

2c. Capping of the bank with an impermeable surface for areas requiring stormwater infiltration source controls.

In each case, identification of areas requiring these actions shall be made entirely consistent with an upland remedial and source control approach as defined at the time of the EE/CA development.

Where multiple issues exist for a particular river bank segment, the overall remedy would include multiple measures that address each issue (e.g., capping for stormwater control, new armoring for erosion control, and a shallow collection trench for groundwater control).

The following criteria shall be used to determine the need for, areas of, and design of, riverbank remedy and source controls:

1. If substantial product is identified in riverbank cores and is contiguous with sediment substantial product (as indicated by sediment cores), the volume of riverbank soils that shall be removed if feasible will extend landward into the riverbank until contiguous product has been removed or a vertical line drawn from the top of the bank (as defined in Section 2.2) is reached. Some product may not be removed because the vertical line at the top of bank is reached, the product extends too deep to be integrated into the sediments dredge prism, or for other feasibility reasons. In these cases, the remaining product shall be capped using an engineered system that reduces potential

contaminant flux and product seepage to acceptable levels consistent with the design approach typically used for a sediment cap.

2a. If a riverbank segment is identified as unstable and contributing to substantial erosion of soils and that DEQ determines presents an ongoing source, the segment shall be stabilized and controlled as noted above.

2b. If a riverbank segment that contains contaminated soils[3] is identified that is subject to shallow groundwater infiltration and that DEQ determines presents an ongoing source that is not already controlled by ongoing upland groundwater source controls, additional control measures as noted above shall be identified.

2c. If a riverbank segment that contains contaminated soils is identified and that DEQ determines presents and ongoing source that is not controlled by ongoing upland source control measures, additional control measures as noted above shall be identified.

In addition to the specific criteria noted above, riverbank slope soils may need to be regraded to achieve stable slopes that can be integrated into the sediments dredge prism. This may include bank areas that do not contain contiguous substantial product or otherwise require source control measures. Such regraded areas shall not be required to meet any of the criteria of removal or source controls as outlined above, but shall include measures to ensure that stable riverbank slopes are constructed.

Riverbank areas on the Siltronic property shall be included in riverbank remediation efforts to the extent that they are adjacent to the sediments remediation area. These riverbanks shall be included in the remediation where they fall within Criterion 1 above or otherwise need to be re-graded to achieve stable slopes that can be integrated into the sediments dredge prism. These Siltronic riverbank areas will not be evaluated relative to source control Criteria 2a, 2b, and 2c above and source controls for Siltronic riverbanks are not included in this SOW. Source controls for Siltronic riverbanks will be evaluated under DEQ oversight.

[3] Contaminated soils will be defined consistent with upland remedy and source control approach (soil PRGs or equivalent).

3.6.2.11 Determination of Areas and Volumes

All of the lines of evidence will generate information that can be used to map areas associated with risk on a station-by-station basis either directly (e.g., observations of product in cores and bioassays) or via extrapolated sediment and/or TZW concentrations (e.g., benthic toxicity model, human health shellfish consumption, and other thresholds), which are equivalent to Preliminary Remediation Goals (PRGs). This information will be mapped using simple spatial approaches, rather than complex geostatistical techniques that may take additional time to negotiate and determine.

Each individual line of evidence discussed above (i.e., presence of substantial product, benthic toxicity bioassays, benthic toxicity models, human health shellfish consumption, human health direct sediment exposures, PECs (and/or sediment values that are protective of benthic macroinvertebrates), baseline levels, and TZW related concentration thresholds) shall be individually mapped and then combined in GIS "overlays" to define the project boundary. Consideration shall be given to the relative weights of each line of evidence. In general, areas that appear to pose risk based on stronger lines of evidence or where multiple lines of evidence overlap shall guide boundary delineation. EPA shall approve (through the Harborwide RI/FS process) relative weights of various lines of evidence for ecological risk as well as the approach for human health evaluation.

Sediment volumes shall be determined in a similar manner, by applying information directly (e.g., product observations in cores) or use of sediment chemistry thresholds. It is important to note that determination of these volumes does not necessarily imply a current or ongoing risk with these buried sediments given that they may be isolated and not available for ongoing exposures to people or ecological receptors.

As discussed in Section 3.4.1.1 the interim project area for the EE/CA shall be later refined for the preliminary design based on the findings of the Harbor FS and eventually shall be included in the EPA Proposed Plan for the Harbor.

3.6.3 Key Technical Issues

Several key technical issues shall be addressed by the EE/CA as noted in the following subsections.

3.6.3.1 Material Disposal Requirements

The EE/CA shall include development of disposal requirements for dredged sediment. While this is not a final determination, these requirements are expected to include:

- A method to determine whether any removed materials are or contain a RCRA hazardous waste ("Hazardous Wastes") or should be specially managed as a non-hazardous waste (e.g., disposed at a Subtitle C facility as a non-hazardous waste) ("Special Wastes"), specifically:
  - Evaluation of TCE, cis-DCE, trans-DCE, 1,1-DCE, and vinyl chloride concentrations to determine whether dredged sediments contain F002 waste.
  - Use of TCLP criteria for MGP-related constituents (e.g., benzene, phenols, chromium, and lead).
- A process for testing removed materials to determine whether the materials are Hazardous Wastes or Special Wastes.
- A health and safety process to control worker exposures to the material during the entire removal, handling, treatment (if necessary), transport, and disposal procedure that is consistent with waste determinations.

Hazardous Wastes shall be transported to and disposed of at an appropriate Subtitle C facility. Special Wastes shall be disposed of at a Subtitle C facility as non-hazardous waste.

Materials that are neither Hazardous Waste nor Special Waste ("Cleanup Materials") may be transported to and disposed of at a Subtitle D landfill, but only if it holds a permit by the State allowing the facility to accept such material. EPA and Respondents acknowledge that, to protect groundwater, OAR 340-093-0170(3)(d) requires an Oregon solid waste landfill receiving cleanup materials contaminated by hazardous substances to develop a "special waste management plan" for the landfill

approved by DEQ allowing the landfill to accept such material. Handling of remediation wastes at the site is described below and shall be more fully detailed in the EE/CA.

Determination Method

The method for characterizing dredged material as a Hazardous Waste or a Special Waste is described below.

The method to determine that MGP-related material should be managed as a Special Waste shall be based on the absence of TCE and associated CVOC chemicals and exceedance of TCLP criteria for any MGP-related constituent. If TCLP criteria are exceeded at the time the material leaves the Site, then the material shall be designated Special Waste and transported to a Subtitle C facility. If not, the material would be disposed of as Cleanup Material at a Subtitle D facility that meets the requirements described above. This method applies to both untreated and post treatment materials, if treatment is proposed. Consequently, an untreated material may meet this definition, but, upon treatment may be determined to no longer meet this definition. In the event that treatment, including treatment in barges, changes the definition, the material would no longer be designated a Special Waste.

The method to determine that sediments impacted only by TCE and associated CVOC chemicals contain F002 Hazardous Waste shall be based on concentrations of TCE, cis-DCE, trans-DCE, 1,1-DCE, and vinyl chloride that exceed DEQ-approved risk-based concentrations (RBCs) to be developed for incidental ingestion, dermal contact and inhalation by landfill workers. If TCE, 1,1-DCE or vinyl chloride are detected in dredged material at concentrations below these RBCs but the material exceeds TCLP criteria for TCE, 1,1-DCE or vinyl chloride, the material shall be designated as a characteristic Hazardous Waste. This method applies to both untreated and post treatment materials. If following treatment, including treatment in barges, the material no longer exceeds the RBCs or the TCLP criteria for TCE and associated CVOCs, the material would be determined not to contain F002 Hazardous Waste and not to be a characteristic Hazardous Waste. If the material is determined to contain F002 Hazardous Waste or to be a characteristic Hazardous Waste because

of TCE and associated CVOCs it would be disposed of at a Subtitle C facility. If not, the material would be disposed of as Cleanup Material at a Subtitle D facility that meets the requirements described above.

It is specifically recognized that commingling of TCE and associated CVOC chemicals with MGP-related constituents and materials occurs at the Site. Therefore, three scenarios are possible:

1. If it is determined that the concentrations of TCE, cis-DCE, trans-DCE, 1,1-DCE, or vinyl chloride in the commingled material exceed DEQ-approved RBCs developed for the landfill exposure scenario, the material shall be designated as and disposed of as F002 HazardousWaste.
2. If it is determined that TCE, 1,1-DCE, or vinyl chloride exceed TCLP criteria, the commingled material shall be designated and managed as Characteristic Hazardous Waste. If it is determined that one or more MGP-related constituents exceed TCLP criteria, the commingled material shall be designated and managed in accordance with applicable state hazardous waste laws.
3. If it is determined that the commingled material is not F002 Hazardous Waste and not a characteristic Hazardous Waste, then the material would be managed as cleanup material.

In addition, exceedance of TCLP criteria for any chemical other than those associated with MGP-related material or TCE and associated CVOCs, would result in the material being designated characteristic Hazardous Waste.

Also, if material containing either type of chemicals meets the following additional definitions of characteristic waste, then it shall be designated and disposed of as a characteristic Hazardous Waste:

- Ignitability – Ignitable wastes are those that can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F) as defined in 40 CFR §261.21.

- Corrosivity – Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) that are capable of corroding metal containers as defined in 40 CFR §261.22 .
- Reactivity – Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water as defined in 40 CFR §261.23.

Testing Process

The sediments and related materials shall be sampled and tested during the data gaps sampling (Section 3.4) per the above methods to determine their designation as Hazardous Waste, Special Waste, or Cleanup Materials. The sediments within the project boundary shall be delineated into management units. Management units shall be defined as the smallest volume of sediment that:

1. can be reasonably separated and handled during construction as a discreet unit (e.g., a barge load, although larger volumes may meet this definition too).
2. can have a single representative composite sample that can be expected to reasonably represent that unit.

Management units shall be consistent with procedures in the *Northwest Regional Sediment Evaluation Framework (*SEF*)*(Interim Final, September 2006), which defines the smallest reasonable unit as 5,000 to 10,000 cubic yards, depending on sediment homogeneity. Specifically, each unit shall be sampled for disposal characterization prior to dredging by taking three cores within the unit (consistent with the SEF) that will be composited into a single sample. If appropriate, the composite sample may be split and some of the subsamples may be bench scale treated before testing. The number of subsamples would be determined by the number of treatment methods or options under consideration. These subsamples shall then be tested per the method described above.

In addition, confirmatory testing shall be conducted during construction. The testing shall be tiered and phased to minimize the potential for construction delays, while ensuring that appropriate disposal determinations have been made based on the pre-construction testing described above. The tiers of testing shall be:

- Tier 1. The first three barge loads will be tested by obtaining representative subsamples during the barge loading and combining them into a composite sample. The exact number of and method off obtaining samples will be detailed in the design documents. Each of these three samples will be analyzed per the methods described above on a quick turn around and results evaluated. If results are consistent with the pre-testing determinations for these management units and with EPA approval, one in every 10 subsequent barge loads will be tested in a similar manner.
- Tier 2. If the results of the next three tested barge loads (i.e., one in every ten barge loads tested after a total of 30 barge loads have gone to disposal) are consistent with pre-testing determinations for these management units and with EPA approval, one in 20 subsequent barge loads will be tested in a similar manner.
- Tier 3. Continue testing 1 in 20 barge loads unless results are inconsistent with pre-testing determinations for the unit in question.

If at any Tier of testing, results are inconsistent with pre-testing determinations, then additional testing of subsequent barge loads and/or additional management of the material may be determined by EPA in coordination with the project team. Additional management may include activities such as enhanced mixing of materials in the barge to increase sediment homogeneity, additional mixing to distribute any stabilization (treatment) materials, addition of more or different stabilizing materials, or a determination that certain dredge units should be re-designated for disposal. After additional management, confirmatory testing would follow the same tiered and phased protocol as noted above.

Health and Safety Procedures Related to Disposal Determinations

At each point in the removal, handling, treatment (if necessary), transport, and disposal process the status of material present at each location in the process shall be determined and made clear to all personnel present. Where the material has not been designated (either by pre-construction testing or during construction confirmatory testing, where applicable) as Hazardous Waste or Special Waste, all

health and safety procedures (including staff training) shall be consistent with handling of such wastes. Where material is determined to not be Hazardous Waste or Special Waste, all health and safety procedures shall be at least consistent with handling of contaminated non-hazardous wastes. Due to its particular characteristics, MGP waste may be handled using procedures similar to hazardous wastes to ensure health and safety. Changes in these procedures shall be consistent with any changes in the status of the materials during the removal, handling, treatment, transport, and disposal process. For example, for material that is a Hazardous Waste or Special Waste prior to treatment, Hazardous Waste health and safety protocols shall be followed through all steps through treatment completion. Once the material is determined to be non-hazardous after treatment, either by confirmatory testing or the establishment that particular treatment steps yield non-hazardous waste based on EPA's determinations from previous batches, then health and safety procedures consistent with the handling of non-hazardous waste Cleanup Materials may be employed after that time where protective of health and safety. The appropriate procedures for each designation as it relates to specific health and safety regulations and standard practice shall be defined in the construction health and safety plan, which is part of the design documents.

The health and safety procedures and staff training for Hazardous Waste and Special Wastes shall be identical throughout the transport, handling, treatment (if necessary), and disposal process.

Decontamination and Prevention of Material Loss

Decontamination of workers and equipment shall take place regardless of waste designations prior to any site egress (landfill, transload facility, or Gasco site). For example, trucks hauling material to the landfill from the transload facility would need to be decontaminated externally before leaving the transload or landfill. The truck bed would require decontamination after each load should the truck be released to do other work between loads. For dedicated trucks and barges, this could occur at the end of the project. Pre and post sampling data shall be required for any transload facility and/or the site itself to ensure material loss or movement from non-designated areas has not occurred. Should significant increases in

chemical concentrations occur, those areas represented by elevated samples shall have material removed and replaced (e.g. gravel shoulders, catchments).

3.6.3.1 Dock Removal and Usage Evaluations

The cost effectiveness of potential dock removal and/or limiting dock usage during construction shall be fully evaluated and considered in the project EE/CA. This will include evaluation of alternatives that consider the full costs of dock replacement, potential limits on dock usage, and the costs of lost business resulting from those alternatives. Also, the EE/CA shall include a comparison of the short term and long term effectiveness of remedial alternatives that include dock removal or limited usage to those that do not.

Consistent with this risk management framework, dock removal's substantial cost will be weighed against the amount of product underneath which could be removed (in the event deep cores cannot be taken underneath the dock, likely substantial product depths will be interpolated from surrounding cores on at least the upstream, downstream, and riverward side), and the long-term effectiveness of such action as compared to other actions, in the context of a final remedy evaluation. Other factors that will be specifically considered include:

- Limitations for sediment removal related to dock stability
- Extent to which various technologies and alternatives can be adapted to minimize business interruptions
- Technologies for cleanup under existing docks while in place such as:
    - sediment removal
    - capping in place
    - in-place stabilization
    - in-situ treatment
    - and others as identified.

The extent to which these technologies address the permanent effectiveness evaluation criteria will be evaluated in detail.

3.6.3.2 ARARs

ARARs shall be identified for each remedial alternative and shall be consistent with the Portland Harbor site when available. Appropriate temporal scales, spatial scales, and points of compliance for water quality ARARs shall also be evaluated.

3.6.3.3 Long Term Effectiveness

Determination of long term effectiveness of combined alternatives shall be conducted including, as relevant, sediment and water quality thresholds related to: sediment chemical concentrations, sediment resuspension, advective/diffusive flux from sediments to surface water, and fate and transport to biota. Various methods for evaluation of capping effectiveness could include comparison of porewater concentrations to surface water criteria and establishment of site-specific risk based sediment criteria consistent with the Portland Harbor BLRA. Although these methods will be considered, both these example methods do not necessarily have to be used in the EE/CA. Performance standards shall be consistent with those in the Portland Harbor ROD.

3.6.3.4 Upland Source Controls

Cleanup alternatives shall be evaluated in the context of upland groundwater source controls, which will be implemented by this time, including:

- Reviewing groundwater seepage rate reductions as measured or predicted for upland source control performance
- Apply the most up to date estimates of groundwater seepage rates and chemical concentrations (as measured or extrapolated) for evaluation of attenuation (i.e, MNR), capping, and dredging alternatives and their long term effectiveness.
- Evaluating attenuation rate predictions for groundwater and TZW that will not be directly remediated by upland source controls.

This evaluation shall also need to show how proposed riverbank remediation and/or stabilization (which will be implemented at the same time as the sediments remedy implementation) shall prevent recontamination of sediments.

3.6.4 Biological Assessment (BA) and Clean Water Act (CWA) Analysis

As noted above, the EE/CA shall include a draft BA for the preferred alternative to help facilitate NOAA consultation on substantive requirements for the project, as well as a CWA draft 404 memorandum, to include time for Agency reviews and necessary revision to the EE/CA before public review. The BA shall identify the presence of threatened, endangered, proposed or candidate species, or their habitat, within the vicinity of the Site and shall comply with the substantive requirements of the Endangered Species Act. The draft BA shall characterize baseline conditions of existing habitat; address potential project impacts that the remedy may have on these species, their habitat, and their food stocks; and describe best management practices and conservation measures designed to avoid or minimize any negative impacts.

Pursuant to dredging, capping, or other filling components of the EE/CA alternatives, Respondents shall submit a draft memorandum with the EE/CA that provides sufficient information to demonstrate compliance with the substantive requirements of Section 404(b) (1) of the CWA. The memorandum shall document the information gathered regarding practicability and cost, long- and short-term impacts from all proposed alternatives, minimization of adverse effects, and an analysis of the need for any mitigation.

3.7 Design Reports

For the start of the design process, the findings of the EE/CA shall be reviewed and compared with the results of the draft Portland Harbor FS. The preferred alternative(s) from the EE/CA shall be refined and adjusted to be consistent with the draft Portland Harbor FS, which may include adjustments to:

- Finalize the areas and volumes of sediments within the project boundary, per the iterative project area identification discussed in Section 3.4.1.1
- Areas and volumes addressed by particular remedial technologies within the overall alternative
- Adjustments to the alternatives needed to accurately address effectiveness issues as evaluated on a harbor-wide basis.

It is conceivable that the adjusted alternative might alter the conclusions of the EE/CA regarding selection of the preferred alternative. However, close coordination between

Gasco Sediment EE/CA and Portland Harbor FS development will be conducted throughout both processes with express goal of ensuring that EE/CA preferred alternative is consistent with the overall expected Portland Harbor FS findings. Given NW Natural's and EPA's close involvement in both processes, this goal appears to be readily achievable.

Once EPA has selected the cleanup alternative(s) based on the findings of the EE/CA and Portland Harbor FS (if available in a timely fashion), the design process will commence. Design reports shall be submitted to EPA for review in three levels of development: preliminary design, interim design, and final design. Because NW Natural has not yet determined whether a bid process or design build process will be used, the design documents may not be in the form of plans and specifications. Regardless, the design submittals shall be of sufficient detail to adequately describe all aspects of the proposed construction process as detailed more below.

Each phase of the design shall include increasingly detailed content for the following design elements noted under Preliminary Design and Interim Design below. Any additional data collection needed to support design shall be identified and conducted during the preliminary design. Depending on the data types (and any timeframes typically associated with laboratory or other analyses), the results of any such design level data collection shall be presented in either the Preliminary Design or the Interim Design.

3.7.1 Preliminary Design

The preliminary design shall include an overall explanation of the following as appropriate:

- For capping, the preliminary design shall show capping areas and conceptual slope and cap designs including areas of overlap with the riverbank source control designs
- For dredging, the conceptual design shall show dredging areas and conceptual cut thicknesses and slope angles
- The extent of groundwater impacts and predicted attenuation rates
- Performance standards shall be developed for all project areas

- Proposed disposal technology (on-site or off-site) conceptual design including general disposal location, handling methods and transport approaches
- Annotated outline of Interim Design analysis report
- Annotated outline of plan drawings
- Annotated outline of specifications or equivalent descriptions
- Draft Water Quality Monitoring Plan and its associated Quality Assurance Project Plan and FSP. The monitoring plan shall detail water quality monitoring to confirm that water quality standards as defined by substantive requirements of CWA Section 401 water quality certification for compliance with the requirements in CWA Section 404(b)(1) guidelines are met outside of any containment features during any capping or dredging operations including dewater return water (if outside containment and as applicable to the design) that may affect the water column outside containment features. Alternatively, depending on the results of the CWA analysis, the monitoring plan may be designed to determine if any temporary allowance for exceedances of water quality standards that are approved for the project are not greater than allowed under the CWA analysis. The plan shall describe the specific water quality monitoring requirements, including a schedule; sampling locations; sampling intervals; sampling equipment and parameters; analytical methods; key contacts; reporting requirements (including daily reports as applicable); daily contacts for notifications of any exceedances; result summaries; and draft and final Water Quality Monitoring reports.
- The preliminary design shall include a revised BA reflecting ESA agency comments on the draft BA in the EE/CA. This BA shall be further refined, if necessary, for the interim design reflecting the updates of any relevant project elements affecting the BA findings.

3.7.2 Interim Design

The Interim Design shall include three separate deliverables as follows and as detailed below:

- Interim Design Analysis Report
- Interim Construction Documents and Schedule
- Interim Design Plans.

The Interim Design Analysis Report shall provide the design criteria and the basis of design for the remedy. Examples of the types of information to be included are described below:

- Technical parameters and supporting calculations upon which the design will be based, including but not limited to design requirements for each remedial action technology to be employed (e.g., dredging, capping, MNR)
- If the selected alternative includes capping:
    - appropriate physical and chemical characteristics of materials to be used for sediment capping and method for identifying and testing clean source material, including acceptance criteria for such material
    - determinations regarding potential propeller scour for capped areas
    - cap placement techniques.
    - General institutional control requirements endemic to the cap design, for later implementation
- For dredging and/or excavation:
    - Identification of requirements for the contractor regarding the handling, transport (including haul routes) and disposal of dredged or excavated sediments , including identification of any best management practices, monitoring, and/or analyses necessary to protect personnel from potential chemical hazards posed by this remedial action (such activities may be further described in the contractor's HASP)
    - Measures necessary to limit off site movement of contaminants from both in water and upland activities. For in water activities this shall be measured through the water quality monitoring plan. For upland activities, this will be measured through pre and post sampling. Cleanup activities shall be required by EPA for any areas showing evidence of contaminant movement in water or upland as a result of the action. This could include, but is not limited to, actions to limit contaminant exposure pathways such as right of way shoulder soil removal/capping, fringe area capping in water, and other actions deemed necessary.
    - design dredge or excavation depths and overcut allowances, dredged or excavated material volumes, and dredging or excavation techniques

    - identification of potential location(s) for disposal of dredged or excavated sediments
    - For dredged material disposal (off-site)), the design documents shall include descriptions of sediment transloading (from water transport to land transport), stockpiling, dewatering, and overland transport.
- For attenuation of TZW impacts resulting from upland source control actions:
    - Measured and/or predicted attenuation rates and timeframes for reaching RAOs and remediation goals at designated points of compliance
    - Monitoring scope and schedule
- Descriptions of the analyses conducted to select the design approach, including a summary and detailed justification of design assumptions and verification that design shall meet performance standards
- Access and easement requirements, and permit requirements or substantive requirements of permits
- Plan for reducing negative effects on the environment and community during the construction phase(s), including alternative fuel usage/emission control usage to the extent practicable to lower vehicle toxics emissions into surrounding communities, beyond the minimums legally required.
- An outline of the long-term monitoring and reporting plan
- Analysis and recommendations on institutional controls and/or engineering controls that may need to be implemented to ensure the long-term effectiveness of the remedy, including descriptions of how such controls would be implemented, by whom, and under what circumstances such controls could be removed or terminated (see "Institutional Controls", EPA 2000).
- If appropriate, conduct an update of the analysis regarding post remedy recontamination of the Site by upland sources of contamination, including what source control actions have occurred since the EE/CA analysis and whether additional actions may be necessary to control potential sources of significant recontamination.

If the selected alternative includes capping, the cap design shall follow appropriate EPA guidance, including "Guidance for In-Situ Subaqueous Capping of Contaminated Sediments" (EPA 1996). Performance of capping activities shall be consistent with

federal regulations, including the requirements of Sections 401 and 404 of the CWA and Section 10 of the Rivers and Harbors Act. For dredging, the performance standards shall be consistent with federal regulations, including requirements of Sections 404 and 401 of the CWA and Section 10 of the Rivers and Harbors Act.

The Interim Construction Documents and Schedule shall include:

- Construction plans/drawings/sketches and required specifications (note that if NW Natural chooses a design/build approach, specifications may not be needed)
- Proposed locations of processes/construction activity or specific requirements for such locations
- Schedule for construction and implementation of the remedy that identifies major milestones.

The Interim Design Plans shall include:

- Draft Construction Quality Assurance Plan (CQAP) which will detail the remediation verification method and approach to quality assurance during construction activities in the project area, including compliance with ARARs. The CQAP describes the project-specific components of the performance methods and quality assurance program to ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The draft Plan shall be submitted with the Interim Design and the Final CQAP shall be submitted with the Final Design. The Final Plan shall be submitted prior to the start of construction in accordance with the approved construction schedule. The CQAP shall describe the methods used to measure compliance with measurement quality objectives (such as performance and method requirements), including target dredge or excavation depths, if appropriate. The CQAP shall include, as an attachment, a Draft Construction Monitoring Plan, which will include a QAPP and FSP. If the selected alternative includes capping, performance monitoring shall include characterization of in-place capping materials (e.g., coverage and thickness). If the selected alternative includes dredging or excavation, performance monitoring shall be performed to confirm that dredged or excavated material is properly staged, dewatered, and transported to a suitable disposal site; and that field construction activities are

properly sequenced. The CQAP shall provide requirements for the following elements:

- Responsibilities and authorities of all organization and key personnel involved in the remedy construction, including EPA and other agencies.
- Qualifications of the Construction Quality Assurance (CQA) Officer and establishing the minimum training and experience of the CQA Officer and supporting inspection personnel.
- Inspection and verification activities that establish the observations and tests that will be required to monitor the construction and/or installation of the components of the remedy. The CQAP will include the scope and frequency of each type of inspection to be conducted. Inspections will be required to verify compliance with environmental requirements and ensure compliance with all health and safety procedures.
- Performance standards and methods describing activities necessary to implement the removal construction. Performance monitoring requirements will be designed to demonstrate that best management practices have been implemented during dredging operations, dredged or excavated material transportation, and cap placement.
- Sampling activities establishing requirements for quality assurance sampling activities, including the sampling protocols, sample size, sample locations, frequency of testing, acceptance and rejection data sheets, and plans for correcting problems as addressed in the project specifications.
- Documentation establishing the reporting requirements for construction quality assurance activities. This will include such items as daily and weekly summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. A description of the provisions for final storage of all records consistent with the requirements of the Settlement Agreement shall be included.

- A revised draft Construction Water Quality Monitoring Plan that shall be refined based upon EPA's comments on the Plan submitted under the Preliminary Design and based on the final Water Quality Monitoring and Compliance Conditions Plan issued by EPA.

- Revised draft performance standards that shall be refined based on EPA's comments on the preliminary design
- Construction HASP, which shall include health and safety procedures for all aspects of the construction including: construction activities, construction monitoring, and water quality monitoring.

The Final Design shall include:

- Final Design Analysis Report
- Final construction documents and schedule
- Final Design Plans
- Operation, Maintenance, and Long Term Monitoring Plan
- Final cost estimate for the action and estimated cost for long-term monitoring
- Final schedule.

3.8 Community Involvement

If requested by EPA, Respondent shall provide information supporting EPA's community involvement programs related to the work performed pursuant to this Settlement Agreement and SOW, and shall participate in public meetings that may be held or sponsored by EPA to explain activities at the action or concerning work performed pursuant to the Settlement Agreement and SOW. EPA will coordinate its community outreach efforts with DEQ.

3.9 Contents of Supporting Plans

QAPPs and HASPs are required under this SOW for both data gathering as a part of alternatives evaluation and design as well as actual construction work as listed above. These documents shall adhere to the requirements set forth in the following two subsections.

3.9.1 Quality Assurance Project Plans

The Respondents shall develop project-specific QAPPs for Design data gathering and construction monitoring. These QAPPs shall contain FSPs detailing field methods. The QAPPs shall be based upon the Settlement Agreement, SOW, and EPA guidance. All sampling and analyses performed pursuant to the Settlement Agreement shall conform

to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control (QA/QC), data validation, and chain-of-custody procedures.

The QAPPs shall define DQOs and detail the sampling and data-gathering methods that will be used for each monitoring activity. It shall include sampling objectives, a detailed description of sampling activities, sample locations, laboratory analytical methods, sampling equipment and procedures, sampling schedule, station positioning, and sample handling (e.g., sample containers and labels, sample preservation), and chain of custody procedures.

The QAPP and associated FSP shall be prepared in accordance with, as appropriate, the following guidance:

- "Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual" (EPA 2001a) or the most current version or updated guidance
- EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA 1988)
- "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (EPA 1990) or the most current version, as guidance for QA/QC and sampling
- "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA 2001b) and "Guidance on Quality Assurance Project Plans (QA/G-5)" (EPA 2002b) or the most current versions.
- For data validation, "Guidance on Environmental Data Verification and Validation, EPA QA/G8" (EPA 2002c), or the most current version
- EPA Functional Guidelines for Data Review.

The QAPPs shall describe the quality assurance and quality control protocols necessary to achieve required DQOs. The QAPPs shall address sampling procedures, sample custody, analytical procedures, adequate detection limits to meet the DQOs, and data reduction, validation, reporting, and personnel qualifications.

Respondents shall only use laboratories that participate in a QA/QC program that conforms with to the following requirements:

- Quality System that complies with "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (ANSI 1994)
- An approved QA program, which complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA 2001c) or equivalent documentation as determined by EPA.
- If a laboratory that is not in the EPA Contract Laboratory Program (CLP) is selected, the QAPPs shall be consistent with the requirements of the CLP for laboratories proposed outside the CLP

Respondents shall provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation, and analysis at reasonable times and upon reasonable notice by EPA.

Upon request by EPA, Respondents shall have such a laboratory analyze samples submitted by EPA for quality-assurance monitoring. Respondents agree that EPA personnel may audit any laboratory that performs analytical work under this SOW. Prior to awarding any work to an analytical laboratory, Respondents shall inform the laboratory that an audit may be performed, and that the laboratory agrees to coordinate with EPA prior to performing analyses.

Respondents shall provide to EPA the quality assurance/quality control procedures followed by all sampling teams and laboratories performing data collection and/or analysis. Upon request by EPA, Respondents shall allow EPA or its authorized representatives to take split and/or duplicate samples. Respondents shall notify EPA not less than 14 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA will have the right to take any additional samples that EPA deems necessary. EPA will use its best efforts to notify Respondents not less than 14 days in advance of any sample collection activity EPA conducts and allow Respondents to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the work.

All analytical data collected under this SOW shall be provided electronically to EPA.

3.9.2 Health and Safety Plan(s)

Respondents shall submit for EPA review and comment HASP(s) that ensures the protection of the public health and safety during performance of on-Site work under the Settlement Agreement. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992. In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. Respondents should refer to diving safety recommendations posted at http://yosemite.epa.gov/R10/CLEANUP.NSF/6d62f9a16e249d7888256db4005fa293/31ae45c9c90a674988256e470062ced9/$FILE/Dive%20Safety%206%2022%202005.pdf in preparing the HASP, to minimize required revisions. Respondent shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the Removal Action.

4 PROJECT SCHEDULE FOR MAJOR DELIVERABLES

Table 1 contains the Schedule for Project Deliverables which is incorporated as an enforceable requirement of this SOW and the Settlement Agreement.

An example schematic project schedule for major project deliverables is summarized in Figure 4. A key aspect of this schedule is recognizing that where practicable EPA comments on a previous submittal may be reflected in the contents of the next submittal if approved by EPA per paragraph 23 of the AOC. To facilitate this, to the extent practicable, EPA will attempt to provide "conditional" approvals indicating additional details expected in the next submittal. The concept behind this process is to avoid repetitive document review/revision cycles. It is recognized in some cases that this may not be the case, and the schedule may need to adjust during the course of the work.

As noted throughout the Statement of Work text, two key linkages between the Gasco Sediments process and larger Portland Harbor process are expected and shown in Figure 4:

- The results of the Harbor RI and BLRAs will inform the Gasco Sediments EE/CA including refinement to determine the Interim Project Area and subareas.
- The results of the Harbor FS will inform the Gasco Sediments Preliminary Design including

- refinement to determine the Final Project Area and subareas
- refinement of the EE/CA preferred alternative(s) for consistency with the Harbor FS preferred alternative.

A third linkage is shown in Figure 4 recognizing that there will be another opportunity to check and refine the final project area based on the final version of the Harbor risk assessment.

5 REFERENCES

ANSI. 1994. Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs E-4. American National Standards Institute.

EPA. 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988. Washington, D.C.

EPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures. OSWER Directive No. 9360.4-01, April 1, 1990. Washington, D.C.

EPA. 1992. EPA's Standard Operating Safety Guide. PUB 9285.1-03, PB 92-963414. Office of Emergency and Remedial Response. Washington, D.C.

EPA. 1996. Guidance for In-Situ Subaqueous Capping of Contaminated Sediments. EPA 905-B96-004, Great Lakes National Program Office. Chicago, Illinois.

EPA. 2000. A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups, EPA 540-F-00-005, OSWER 9355.0-74FS-P, September 2000. Washington, D.C.

EPA. 2001a. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. Office of Water. October, 2001. EPA/823/B-01-002. Washington D.C.

EPA. 2001b. EPA Requirements for Quality Assurance Project Plans (QA/R-5). Office of Environmental Information. EPA/240/B-01/003. March 2001. Washington, D.C.

EPA. 2001c. EPA Requirements for Quality Management Plans (QA/R-2). Office of Environmental Information. EPA/240/B-01-002. March 2001. Washington, D.C.

EPA. 2002a. Office of Solid Waste and Emergency Response Memorandum. Subject: Transmittal of Policy Statement: "Role of Background in the CERCLA Cleanup Program" OSWER 9285.6-07P. From: Michael B. Cook, Director s/ Michael B. Cook, Office of Emergency and Remedial Response. To: Superfund National Policy Managers Regions 1 – 10. Signed May 1, 2002

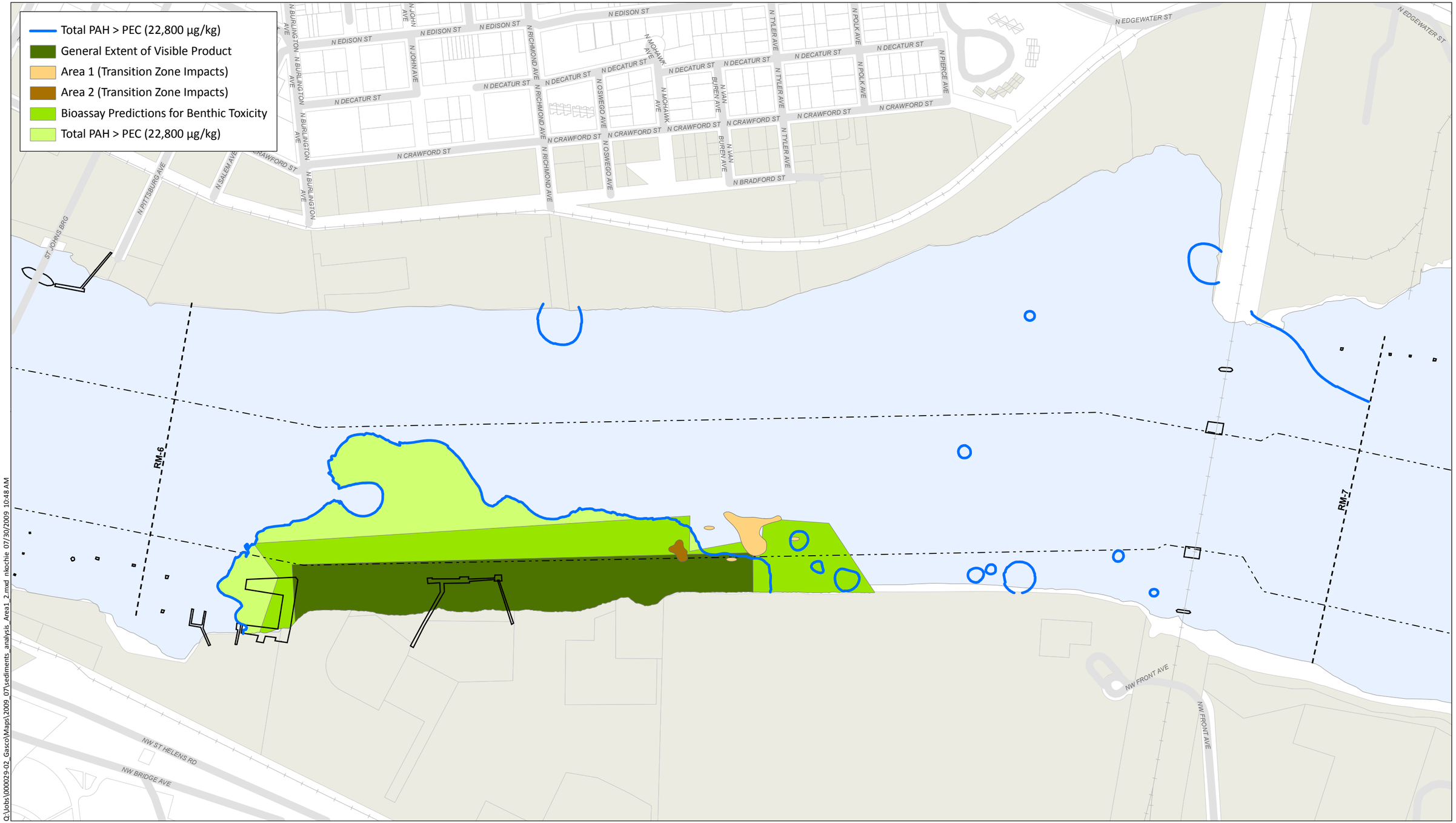
EPA. 2002b. Guidance on Quality Assurance Project Plans (QA/G-5). Office of Environmental Information. EPA/240/R-02/009. December, 2002. Washington, D.C.

EPA. 2002c. Guidance on Environmental Data Verification and Data Validation. EPA QA/G-8. Office of Environmental Information. EPA/240/R-02/004. November 2002. Washington, D.C.

EPA. 2005. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. EPA-540-R-05-012, Office of Solid Waste and Emergency Response, OSWER 9355.0-85. December 2005. Washington, D.C.

Table 1. Schedule of Project Deliverables

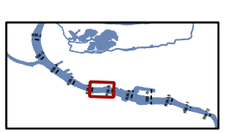
No.	Deliverable	Delivery Time
1	Draft Work Plan	Within 30 days of effective date of the Order
2	Final Work Plan	Within 30 days after EPA comments on the Draft Work Plan (1)
3	Project Area Identification Report and Data Gaps QAPP	Within 75 days after receipt of EPA comments on the Draft Work Plan (1)
4	Draft EE/CA and Data Report	Within 90 days after receipt of validated data from data gaps sampling
5	Final EE/CA (if required by EPA)	Within 45 days after receipt of EPA comments on the Draft EE/CA (4)
6	Preliminary Design Report	Within 90 days after receipt of EPA comments on the Draft EE/CA (4) or the Final EE/CA (5), as appropriate
7	Interim Design Report	Within 120 days after receipt of EPA comments on the Preliminary Design Report (6)
8	Final Design Report	Within 90 days after receipt of EPA comments on the Interim Design Report (7)



Q:\Jobs\000029-02_Gasco\Maps\2009_07\sediments_analysis_Area1_2.mxd nkorchie 07/30/2009 10:48 AM

ANCHOR QEA

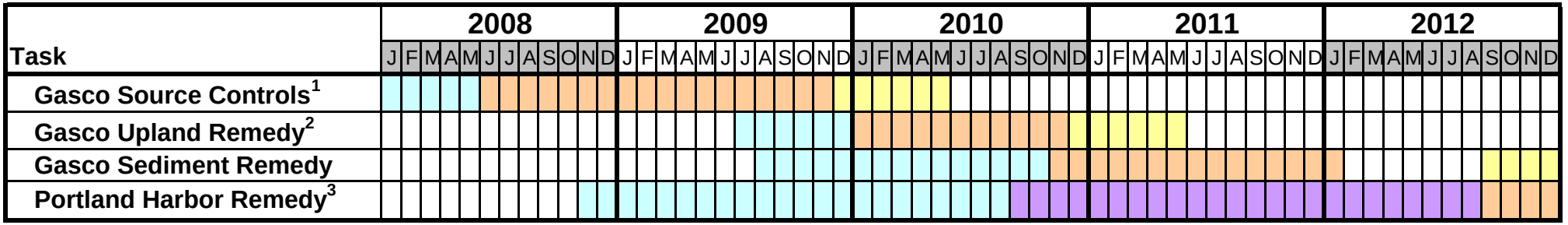
NOTES:
Area 1 and Area 2 boundaries indicate the approximate extent of transition zone water or surface water exceedences of the Joint Source Control Strategy Screening Level Values for TCE (30 µg/L), cis-1,2-DCE (70 µg/L), or vinyl chloride (2.4 µg/L) based upon data collected in 2004 and 2005.



Feet
0 200 400 600 800

Figure 1
Potential Remediation Extents Based on the Data Available as of July 2009
NW Natural "Gasco" and Siltronic Sites
Portland, Oregon

Figure 2. Programmatic Sequence



Footnotes:

Figure 2 is for illustrative purposes only and is not an enforceable schedule under this Administrative Settlement.

- Data Collection and FS Phase
- Design Phase
- Construction Phase
- EPA FS Review, Proposed Plan, and ROD

1 Gasco source controls are being evaluated and implemented by NW Natural through an Order with Oregon DEQ. The noted timeline is estimated and dependent upon the timeliness and content of DEQ comments, over which NW Natural has no control.

2 The Gasco upland remedy is being evaluated and implemented by NW Natural through an Order with Oregon DEQ. The noted timeline is estimated and dependent upon the timeliness and content of DEQ comments, over which NW Natural has no control.

3 The Portland Harbor remedy is being evaluated through an RI/FS conducted by the Lower Willamette Group (LWG), which is under Order with EPA Region 10. EPA is solely responsible for FS Review, the Harbor Proposed Plan, and the Harbor Record of Decision (ROD). The noted timeline is estimated and dependent upon the ability of the LWG to meet the RI/FS submittal timeline, the timeliness and content of EPA comments on the RI/FS, as well as EPA's timing for developing the Proposed Plan and ROD. NW Natural has no control over these factors.

Substantial Product

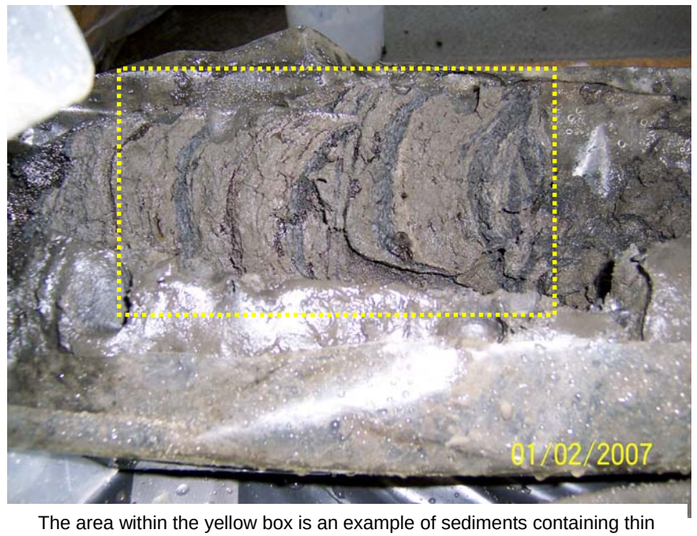
Sediments saturated with product over a several inch interval

Sediments with substantial tar and pockets of mobile liquid product

Sediments containing bands of tar and semi-solid product greater than 2 inches

Not Substantial Product

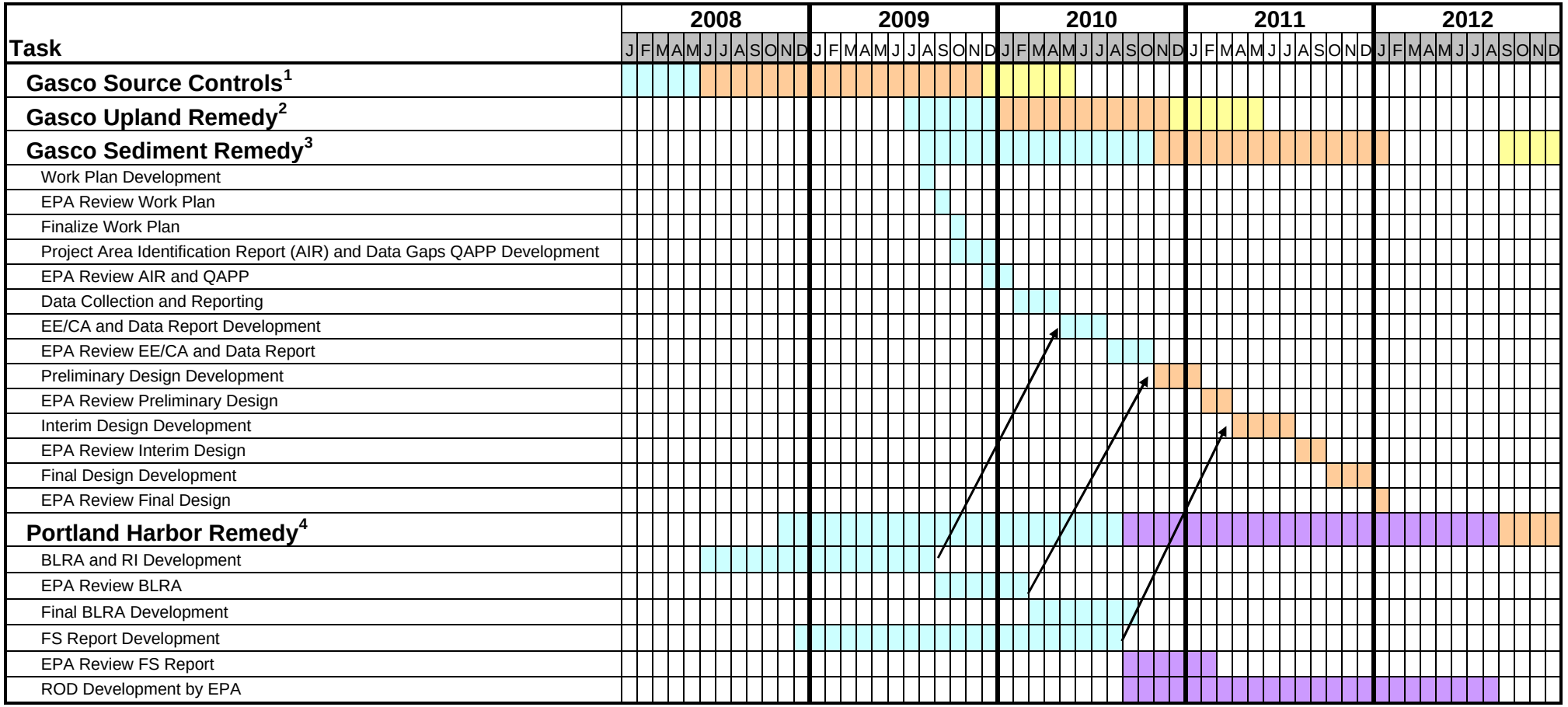
Sediments exhibiting sheen only



The area within the yellow box is an example of sediments containing thin layers of tar. Note the scale is not clear from picture. If any layers are more than 2-inches thick, then this would meet the definition of substantial product.

Figure 3
Example Core Photos of Sediments Meeting the Definition of
"Substantial" Product and Sediments That Do Not Meet This Definition

Figure 4. Detailed Sequence of Major Deliverables



Footnotes:

The Gasco Source Control, Gasco Upland Remedy, and Portland Harbor Remedy schedule elements are for illustrative purposes only and are not enforceable schedules under this Administrative Settlement.

- Data Collection and FS Phase
- Design Phase
- Construction Phase
- EPA FS Review, Proposed Plan, and ROD

1 Gasco source controls are being evaluated and implemented by NW Natural through an Order with Oregon DEQ. The noted timeline is estimated and dependent upon the timeliness and content of DEQ comments, over which NW Natural has no control.

2 The Gasco upland remedy is being evaluated and implemented by NW Natural through an Order with Oregon DEQ. The noted timeline is estimated and dependent upon the timeliness and content of DEQ comments, over which NW Natural has no control.

3 The noted timeline is dependent upon the timeliness of the EPA comments, over which NW Natural has no control.

4 The Portland Harbor remedy is being evaluated through an RI/FS conducted by the Lower Willamette Group (LWG), which is under Order with EPA Region 10. EPA is solely responsible for FS Review, the Harbor Proposed Plan, and the Harbor Record of Decision (ROD). The noted timeline is estimated and dependent upon the ability of the LWG to meet the RI/FS submittal timeline, the timeliness and content of EPA comments on the RI/FS, as well as EPA's timing for developing the Proposed Plan and ROD. NW Natural has no control over any of these factors.