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**APPENDIX D**

Construction Plans and Specifications

# ENHANCED NATURAL RECOVERY/ ACTIVATED CARBON PILOT STUDY

CONTRACT NUMBER: C00992C15

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OCTOBER 2015



**KING COUNTY**


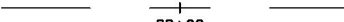
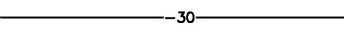




















Department of Natural Resources and Parks  
Wastewater Treatment Division



**GENERAL NOTES:**

1. ALL UTILITY INFORMATION SHOWN ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL THE UTILITIES BEFORE MOBILIZATION. THE CONTRACTOR SHALL CALL 1-800-424-5555 AT LEAST TWO BUSINESS DAYS (48 HOURS) BEFORE THE START OF THE WORK.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING UNDERGROUND AND ABOVE GROUND UTILITIES AND PROMPT REPAIR IF DAMAGED.
3. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXTENT OF THE HAZARD CREATED BY OVERHEAD OR UNDERGROUND ELECTRICAL POWER IN ALL AREAS AND SHALL FOLLOW PROCEDURES DURING CONSTRUCTION, AS REQUIRED BY LAW REGULATIONS, UTILITY OWNER OR SAFE CONSTRUCTION PACKAGES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH UTILITY OWNERS AND REMEDIAL MEASURES MAY BE REQUIRED.
4. THE FIRE DEPARTMENT SHALL BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF ANY ACTIVITIES THAT WOULD PREVENT USE OF ANY FIRE HYDRANTS.
5. EXISTING SURFACE ELEVATIONS FOR THE SCOUR PLOT PROJECT AREA CREATED FROM THE MULTIBEAM BATHYMETRIC SURVEY CONDUCTED BY DAVID EVANS AND ASSOCIATES, INC. ON AUGUST 25-29, 2003.
6. EXISTING SURFACE ELEVATIONS FOR THE SUBTIDAL PLOT PROJECT AREA CREATED FROM THE MULTIBEAM BATHYMETRIC SURVEY OF THE NAVIGATION CHANNEL CONDUCTED BY USACE ON JUNE 18-19, 2013.
7. EXISTING SURFACE ELEVATIONS FOR THE INTERTIDAL PLOT PROJECT AREA CREATED FROM A COMBINATION OF THE MULTIBEAM BATHYMETRIC SURVEY CONDUCTED BY DAVID EVANS AND ASSOCIATES, INC. ON AUGUST 25-29, 2003 FOR THE AREA THAT IS MORE THAN 40 FT OUTSIDE OF THE NAVIGATION CHANNEL AND THE MULTIBEAM BATHYMETRIC SURVEY OF THE NAVIGATION CHANNEL CONDUCTED BY USACE ON JUNE 18-19, 2013 FOR THE AREA INSIDE THE NAVIGATION CHANNEL WITH A 40 FT BUFFER.
8. HORIZONTAL DATUM: WASHINGTON NORTH AMERICAN DATUM (NORTH ZONE) 1983/1991 (NAD-83/91), U.S. SURVEY FEET.
9. VERTICAL DATUM: MEAN LOWER LOW WATER (MLLW), 1960-1978 EPOCH FOR THE DEA 2003 BATHYMETRY AND MLLW 1983-2001 EPOCH FOR THE USACE 2013 BATHYMETRY.
10. PROPERTY LINE PARCEL DATA WAS RECEIVED FROM AECOM USED IN THE 2012 FEASIBILITY STUDY.
11. CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, DOCKS, PILINGS, ETC. DURING PERFORMANCE OF THE WORK.
12. NO WORK SHALL BE PERFORMED PRIOR TO SUBMITTAL AND ACCEPTANCE OF CONTRACTORS REMEDIAL ACTION WORK PLAN (RAWP), HEALTH AND SAFETY PLAN (HASP) AND CONTRACTOR QUALITY CONTROL PLAN (CQCP) SEE SPEC SECTIONS 01300 AND 02221.
13. CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH PLANS, SPECIFICATIONS, AND ACCEPTED RAWP. CONTRACTOR SHALL HAVE READ AND FAMILIARIZED THEMSELVES WITH SPECIFICATIONS PRIOR TO MOBILIZATION.
14. KING COUNTY PROJECT REPRESENTATIVE (PR) MUST APPROVE TEST PLACEMENTS OF SAND ENR MATERIAL WITH AC AND SANDY GRAVEL ENR MATERIAL WITH AC PRIOR TO ANY PLACEMENT OUTSIDE OF DESIGNATED DEMONSTRATION AREAS (SEE SPEC 02221).
15. CONTRACTOR SHALL NOT CAUSE DISTURBANCE OF PLOTS ONCE MATERIAL HAS BEEN PLACED (EITHER LIFT) BY ANY MEANS INCLUDING SPUDS, ANCHORS, PROP WASH, CLAMSHELL BUCKET CONTACTING BOTTOM, GROUNDING OF EQUIPMENT ETC. SEE SPEC SECTION 02221.
16. CONTRACTOR SHALL BE AWARE OF AND COORDINATE THEIR WORK WITH OTHER WATERWAY USERS INCLUDING TRIBAL FISHING, VESSEL BERTHING AT THE SCOUR SITE, GENERAL WATERWAY TRAFFIC ETC. PER SPEC SECTION 02221.

**LEGEND:**

-  RIGHT-OF-WAY / PROPERTY LINE
-  CENTERLINE ALIGNMENT
-  EXISTING MAJOR CONTOURS
-  EXISTING MINOR CONTOURS
-  EXISTING OVER WATER STRUCTURES
-  EXISTING DOCK AT SCOUR PLOT
-  NAVIGATION CHANNEL LINE
-  EXISTING PILES
-  EXISTING DOLPHINS
-  PLOT AREA
-  CROSS SECTION EXISTING GRADE
-  APPROXIMATE LIMIT OF EXISTING SHORELINE RIP-RAP
-  APPROXIMATE EXTENTS OF 4H:1V SIDE SLOPE
-  ENR GRAVELLY SAND MATERIAL
-  ENR GRAVELLY SAND + AC MATERIAL
-  ENR SAND MATERIAL
-  ENR SAND + AC MATERIAL
-  DEMONSTRATION AREAS
-  POTENTIAL ADDITIONAL PLACEMENT AREA IF EXCESS MATERIAL AVAILABLE. PLACE AS DIRECTED BY PROJECT REPRESENTATIVE. SLOPES TO BE ADJUSTED ACCORDINALLY.
-  OUTFALL
-  ABANDONED OUTFALL
-  APPROXIMATE CONFIRMATION STAKE LOCATION
-  TEMPORARY CONTROL POINT (TO BE SET BY COUNTY PRIOR TO MOBILIZATION, APPROXIMATE LOCATION SHOWN, SUBJECT TO CHANGE)

**ABBREVIATIONS:**

- ∅ DIAMETER
- > LESS THAN
- < GREATER THAN
- AC GRANULAR ACTIVATED CARBON
- BTM BOTTOM
- ℄ CENTERLINE
- E EASTING, EAST
- ENR ENHANCED NATURAL RECOVERY
- MLLW MEAN LOWER LOW WATER
- N NORTHING, NORTH
- NA NOT APPLICABLE
- NTS NOT TO SCALE
- ℄ PROPERTY LINE
- RM RIVER MILE
- S SOUTH
- SEC SECTION
- STA STATION
- W WEST
- WA WASHINGTON

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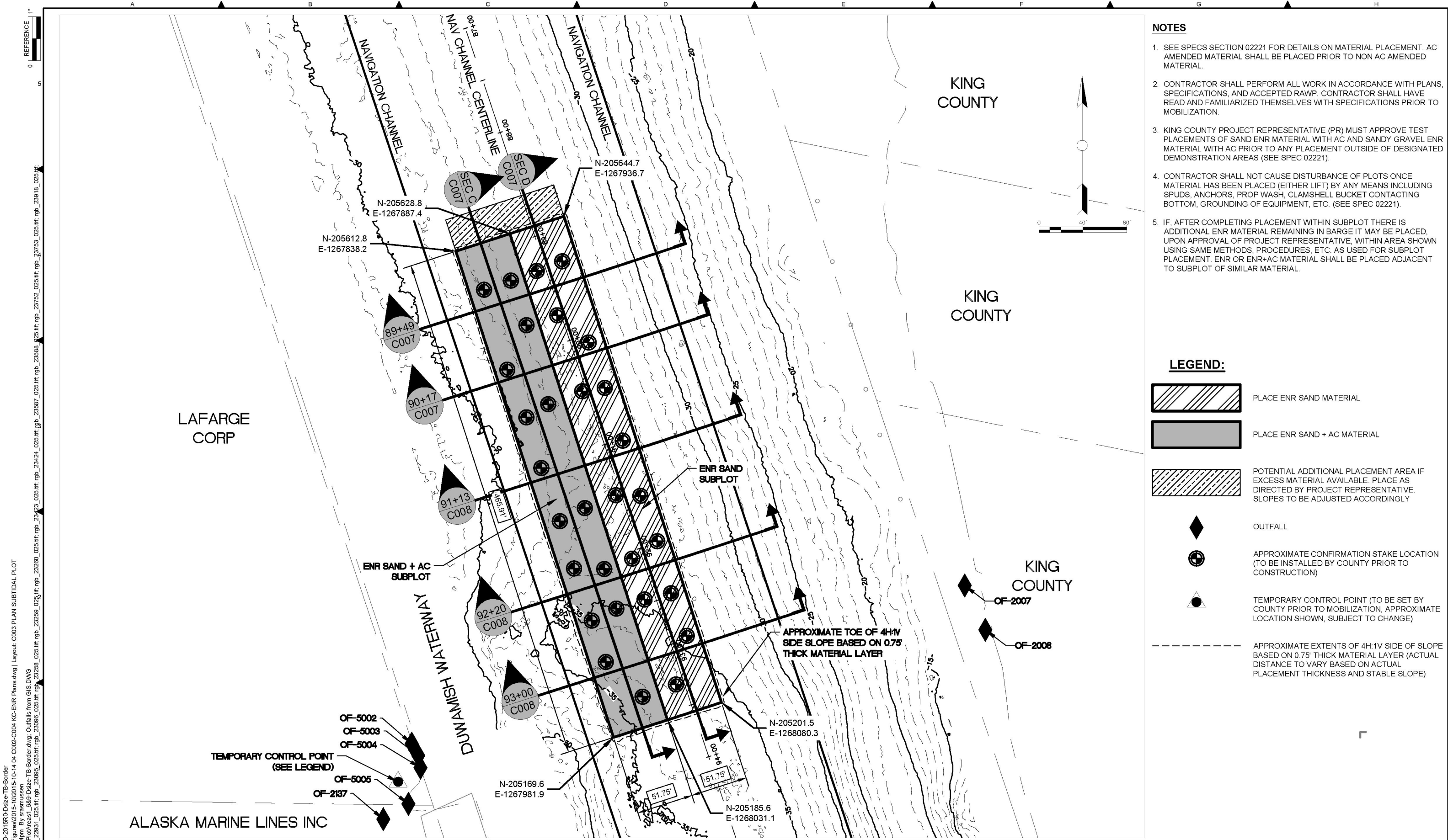


DEPARTMENT OF NATURAL RESOURCES & PARKS  
 WASTEWATER TREATMENT DIVISION  
**NOTES, SYMBOLS, AND ABBREVIATIONS**

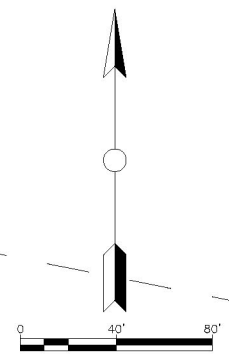
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SHT NO / TOTAL 02 / 11
REV NO: <b>0</b>







- NOTES**
- SEE SPECS SECTION 02221 FOR DETAILS ON MATERIAL PLACEMENT. AC AMENDED MATERIAL SHALL BE PLACED PRIOR TO NON AC AMENDED MATERIAL.
  - CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH PLANS, SPECIFICATIONS, AND ACCEPTED RAWP. CONTRACTOR SHALL HAVE READ AND FAMILIARIZED THEMSELVES WITH SPECIFICATIONS PRIOR TO MOBILIZATION.
  - KING COUNTY PROJECT REPRESENTATIVE (PR) MUST APPROVE TEST PLACEMENTS OF SAND ENR MATERIAL WITH AC AND SANDY GRAVEL ENR MATERIAL WITH AC PRIOR TO ANY PLACEMENT OUTSIDE OF DESIGNATED DEMONSTRATION AREAS (SEE SPEC 02221).
  - CONTRACTOR SHALL NOT CAUSE DISTURBANCE OF PLOTS ONCE MATERIAL HAS BEEN PLACED (EITHER LIFT) BY ANY MEANS INCLUDING SPUDS, ANCHORS, PROP WASH, CLAMSHELL BUCKET CONTACTING BOTTOM, GROUNDING OF EQUIPMENT, ETC. (SEE SPEC 02221).
  - IF, AFTER COMPLETING PLACEMENT WITHIN SUBPLOT THERE IS ADDITIONAL ENR MATERIAL REMAINING IN BARGE IT MAY BE PLACED, UPON APPROVAL OF PROJECT REPRESENTATIVE, WITHIN AREA SHOWN USING SAME METHODS, PROCEDURES, ETC. AS USED FOR SUBPLOT PLACEMENT. ENR OR ENR+AC MATERIAL SHALL BE PLACED ADJACENT TO SUBPLOT OF SIMILAR MATERIAL.



- LEGEND:**
- PLACE ENR SAND MATERIAL
  - PLACE ENR SAND + AC MATERIAL
  - POTENTIAL ADDITIONAL PLACEMENT AREA IF EXCESS MATERIAL AVAILABLE. PLACE AS DIRECTED BY PROJECT REPRESENTATIVE. SLOPES TO BE ADJUSTED ACCORDINGLY
  - OUTFALL
  - APPROXIMATE CONFIRMATION STAKE LOCATION (TO BE INSTALLED BY COUNTY PRIOR TO CONSTRUCTION)
  - TEMPORARY CONTROL POINT (TO BE SET BY COUNTY PRIOR TO MOBILIZATION, APPROXIMATE LOCATION SHOWN, SUBJECT TO CHANGE)
  - APPROXIMATE EXTENTS OF 4H:1V SIDE OF SLOPE BASED ON 0.75' THICK MATERIAL LAYER (ACTUAL DISTANCE TO VARY BASED ON ACTUAL PLACEMENT THICKNESS AND STABLE SLOPE)

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ALASKA MARINE LINES INC

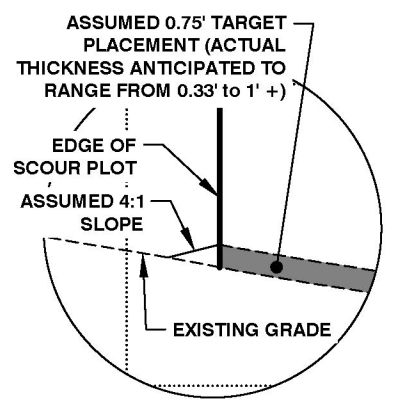
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  - OF-5003
  - OF-5004
  - OF-5005
  - OF-2137

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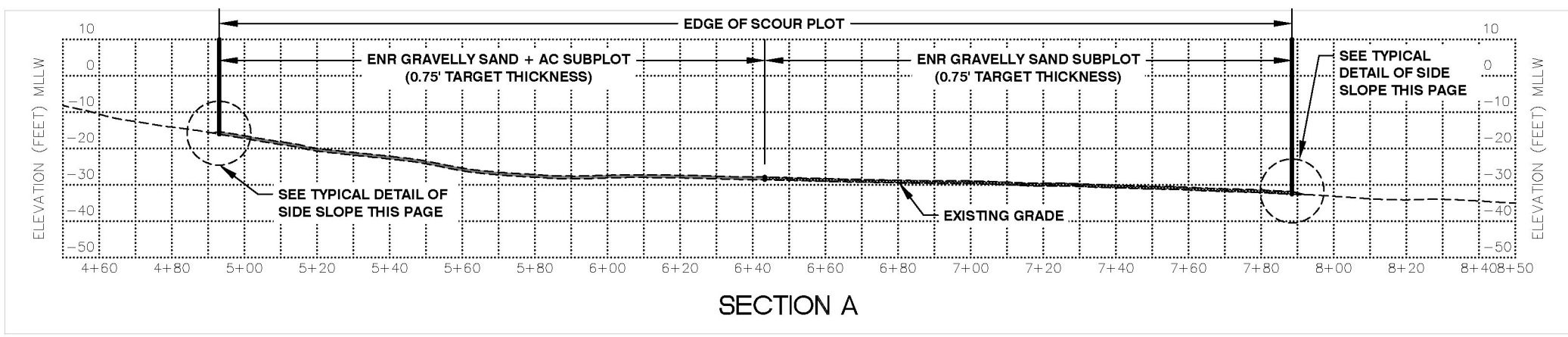




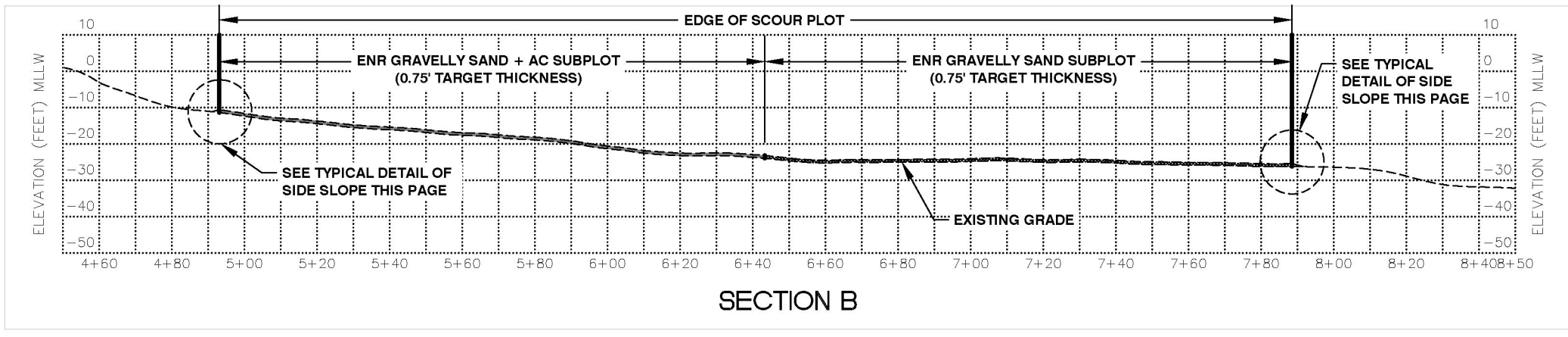
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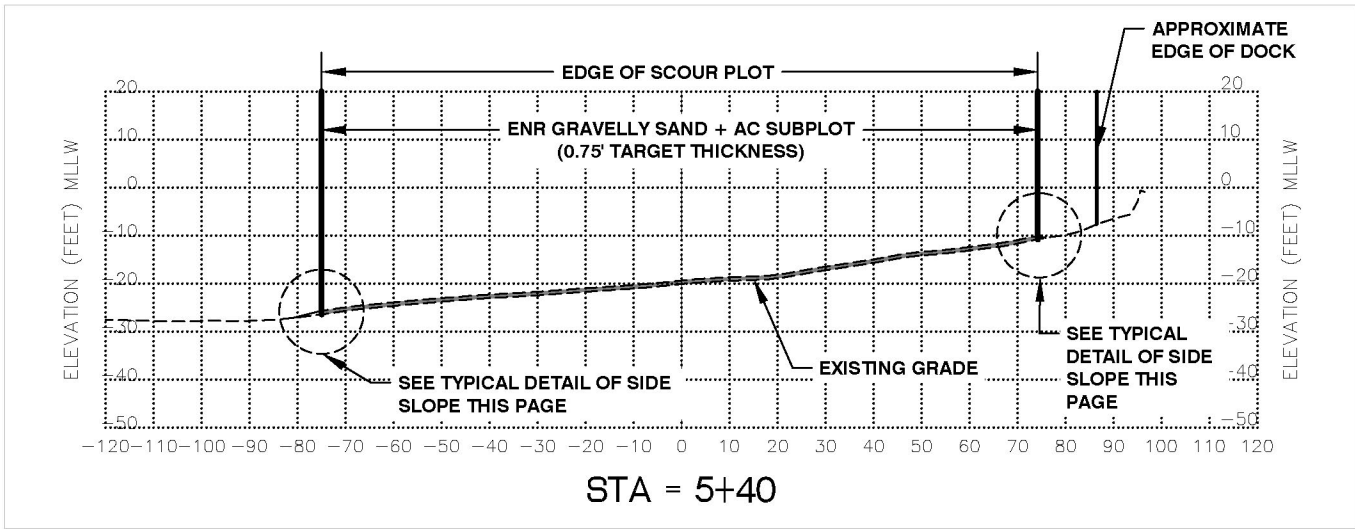
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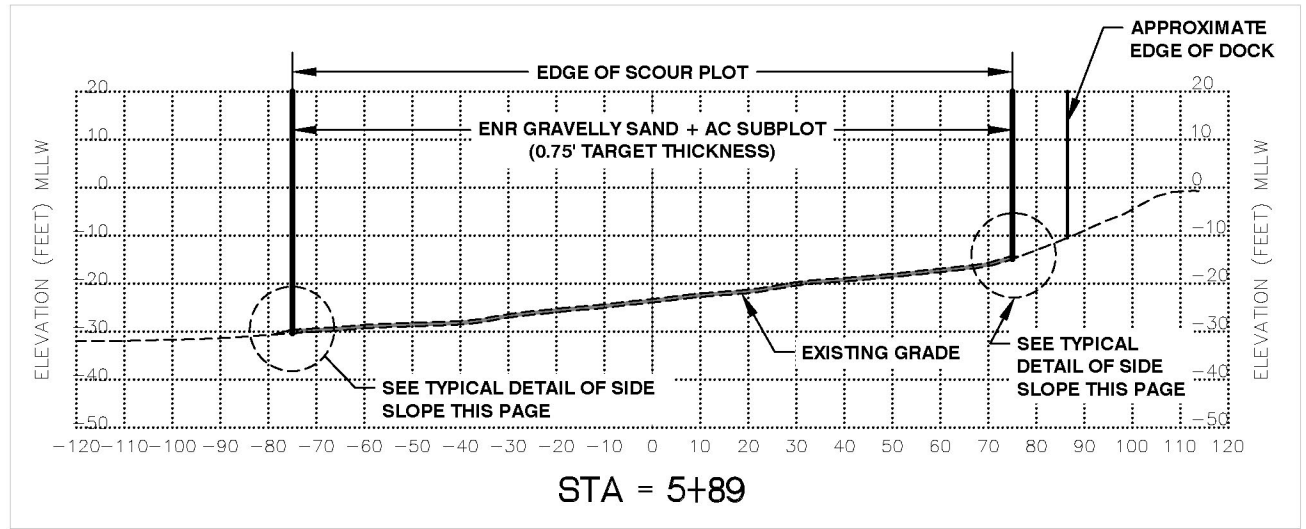
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SECTION B

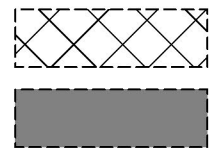


STA = 5+40



STA = 5+89

LEGEND:



PLACE ENR GRAVELLY SAND MATERIAL  
PLACE ENR GRAVELLY SAND + AC MATERIAL

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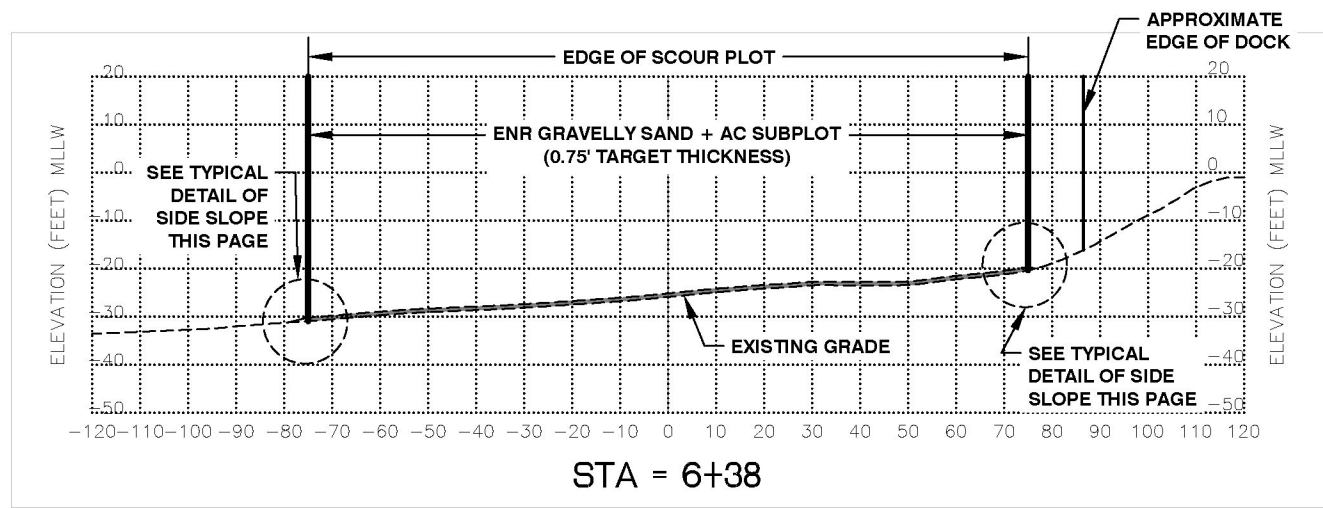
DEPARTMENT OF NATURAL RESOURCES & PARKS  
WASTEWATER TREATMENT DIVISION

SCOUR PLOT  
(RM 0.04 to 0.10)  
SECTION VIEWS

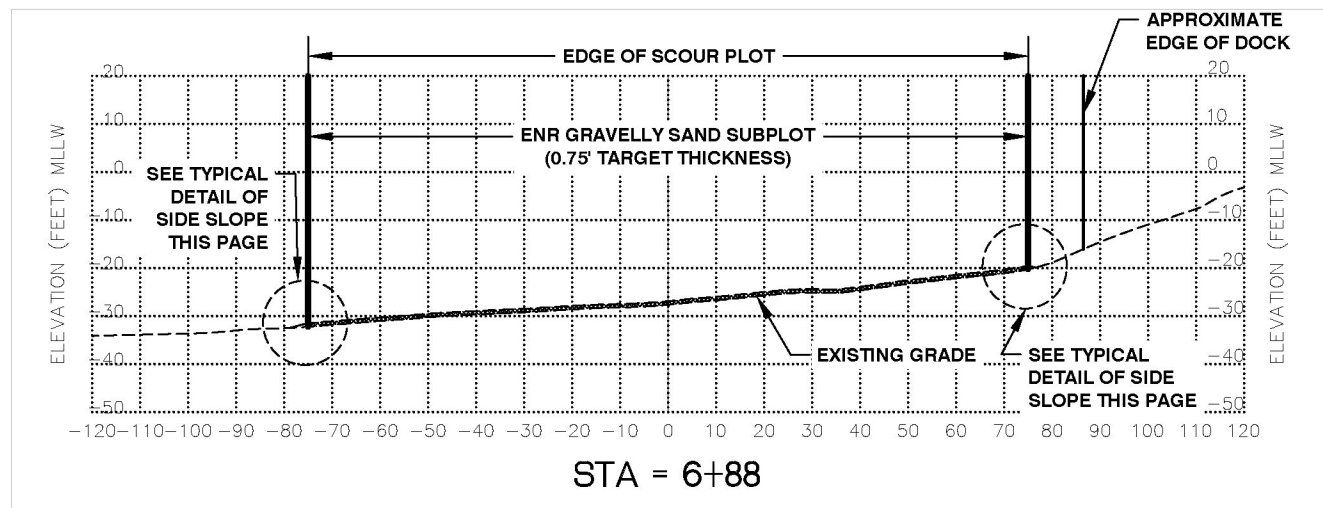
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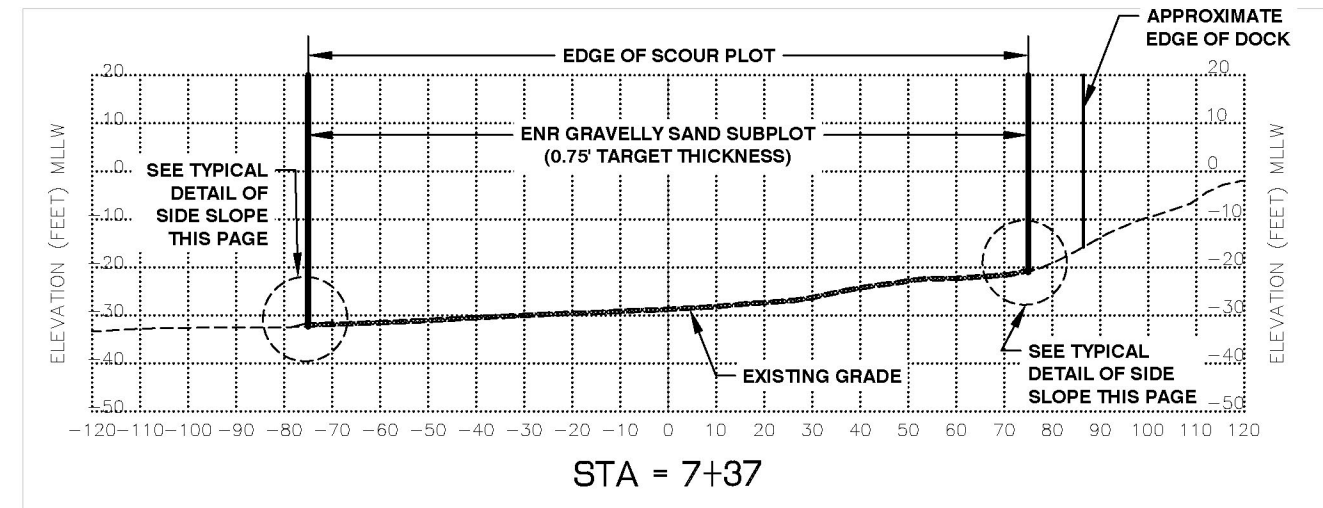
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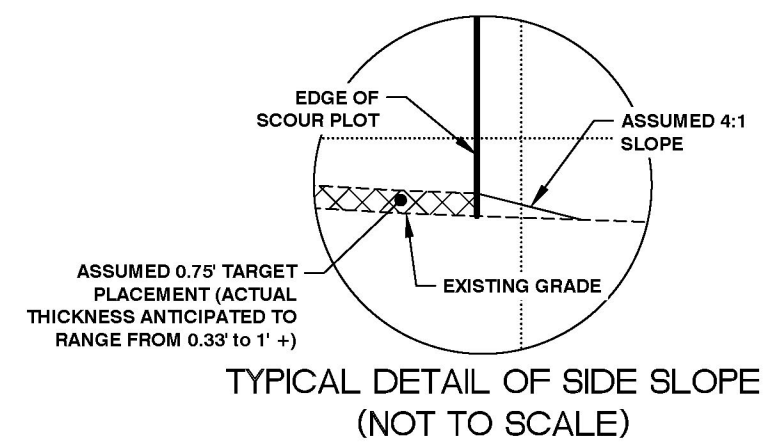
STA = 6+38



STA = 6+88



STA = 7+37



**LEGEND:**

- PLACE ENR GRAVELLY SAND MATERIAL
- PLACE ENR GRAVELLY SAND + AC MATERIAL

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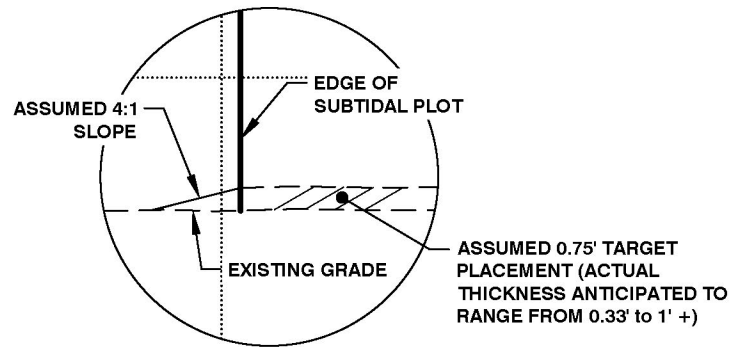


DEPARTMENT OF NATURAL RESOURCES & PARKS  
 WASTEWATER TREATMENT DIVISION  
  
**SCOUR PLOT  
 (RM 0.04 to 0.10)  
 SECTION VIEWS**

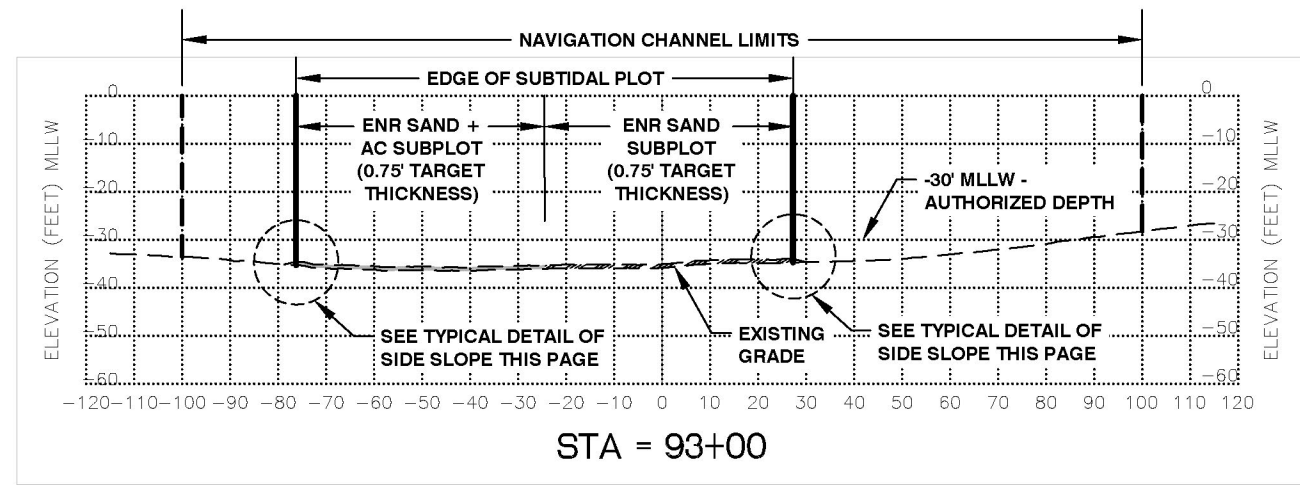
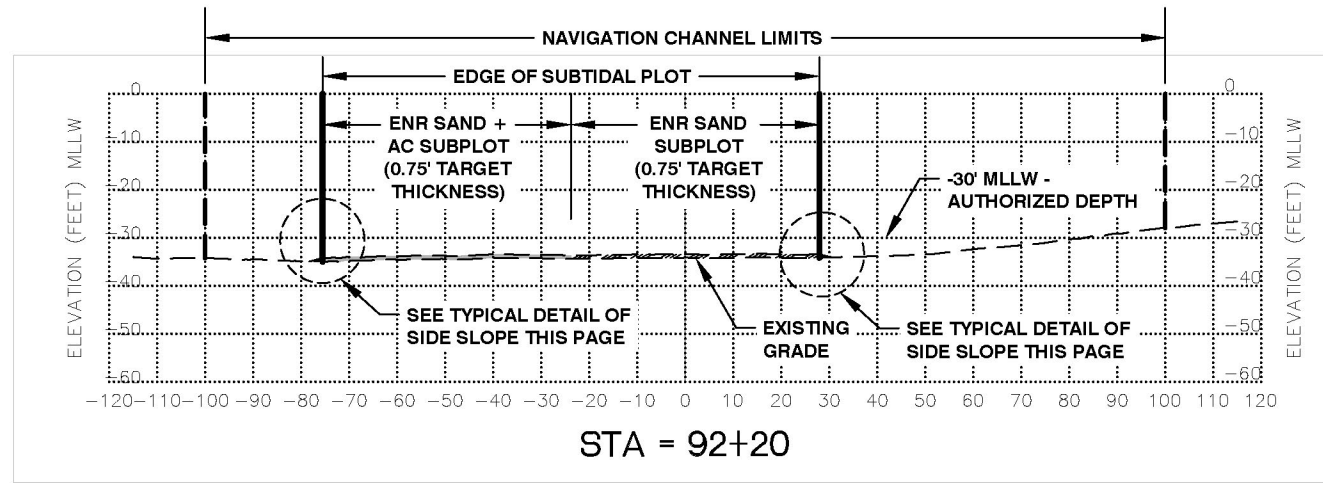
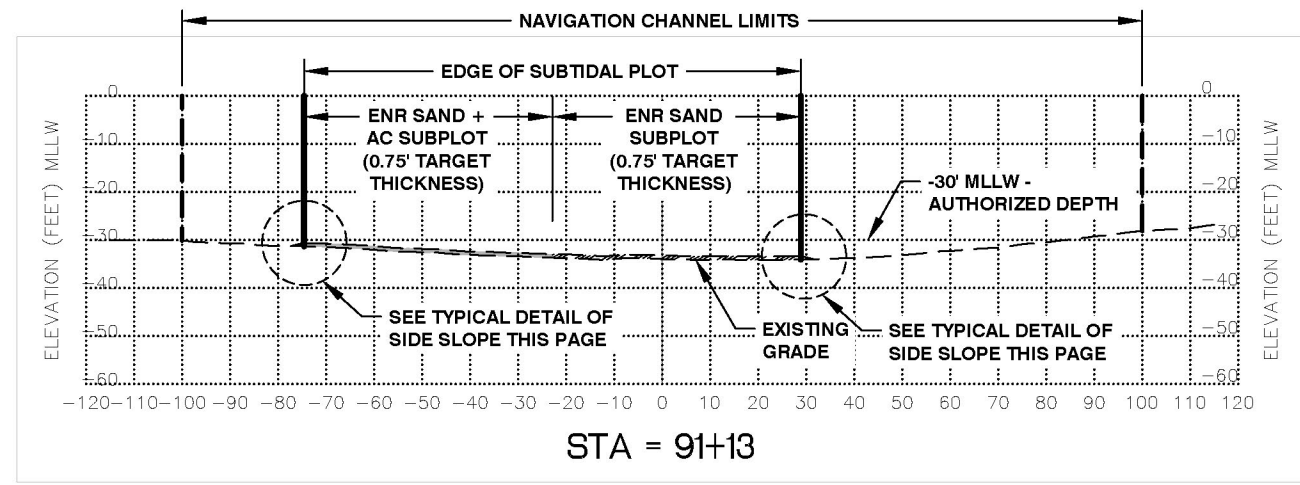
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SHT NO / TOTAL 07 / 11
REV NO: 0



0 1" REFERENCE



TYPICAL DETAIL OF SIDE SLOPE (NOT TO SCALE)



**LEGEND:**



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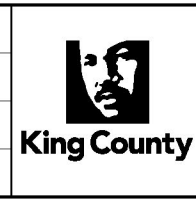


PLACE ENR SAND + AC MATERIAL

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PROJECT ACCEPTANCE:	CONTRACT NO: E00334E14



DEPARTMENT OF NATURAL RESOURCES & PARKS  
WASTEWATER TREATMENT DIVISION

**SUBTIDAL PLOT  
(RM 1.13 to 1.23)  
SECTION VIEWS**

DATE: OCT 2015
PROJECT FILE NO: 15-XXXXXXX
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SHT NO / TOTAL 09 / 11
REV NO: <b>0</b>







## **SPECIFICATIONS**

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# King County ENR Pilot Study Specifications

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01050	SURVEY INFORMATION
01062	PERMITS AND EASEMENTS
01063	HEALTH AND SAFETY
01200	CONTRACT MEETINGS
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### DIVISION 2 - SITE CONSTRUCTION

02221	BACKFILLING
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**SECTION 01010**  
**SUMMARY OF WORK**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section contains a summary of the Work in this Contract and other known work in the vicinity of the Contract Work.
- B. The Work to be performed under this Contract consists of furnishing all tools, equipment, materials, supplies, and manufactured articles; furnishing all labor, transportation, and services, including fuel, power, water, and essential communications; and performing all work or other operations required for the fulfillment of the Contract, in strict accordance with the Contract Documents. Provide all work, materials, and services not expressly indicated in the Contract Documents that may be necessary for the complete and proper construction of the Work and administration of the contract. The project work involves the placement of Enhanced Natural Recovery (ENR) materials, sand or gravelly sand, alone or either of the two blended with Granular Activated Carbon (AC) at three separate approximate one acre plots within the Lower Duwamish Waterway (LDW) in Seattle and Tukwila, WA. Each approximate one acre test plot placement includes an approximate ½ acre subplot of ENR material alone and a second approximate ½ acre subplot of ENR+AC. Within each plot a minimum of a 4 inch (0.333 foot) thick layer of ENR or ENR+AC material will result by uniformly placing a volume equivalent to a 9 inch (0.75 foot) thick layer over the area with the intent of achieving a target thickness of 6 to 9 inches (0.5 to 0.75 foot) over the placement area. Sand ENR material will be used at one plot location (Subtidal Plot) and gravelly sand ENR material at two plots (Scour Plot and Intertidal Plot).
- C. The objective of the Work is to place the ENR materials in a manner that reduces potential for winnowing and loss of the AC during placement and results in plots that are as uniformly constructed as practicable. This includes releasing the ENR materials approximately 2' above bed to reduce potential for winnowing as material falls thru the water column. Constructed plots will be used for a 3 year monitoring study of the performance of ENR+AC compared to the ENR Material alone.
- D. Granular Activated Carbon has material properties including a low specific gravity and a high void ratio that make placement of AC blended with sand or other aggregates more complex than placement of sand and gravel materials alone. Contractor is expected to understand the specific properties of AC as related to placement of AC blended with sand or sand and gravel in an aquatic environment prior to material placement. The low specific gravity of the AC will make it more prone to winnowing, loss and segregation than materials of a similar grainsize but having a higher specific gravity.

**1.02 WORK OF THIS CONTRACT**

- A. The work of this Contract includes:
  - 1. Preparation of Contractor Submittals.
  - 2. Test placement of materials to develop optimal bucket placement grid, bucket overlap and bucket fill factor.
    - a. Contractor shall perform Material Placement Testing to calibrate and verify appropriate clamshell bucket volume and fill factor, bucket pattern, resulting placement area, and thickness by trial placement of the material into a predefined area of the intertidal plot (for Gravelly Sand ENR Material) and an adjacent area (for sand ENR Material). Test Placement shall be completed and approved by Project Representative prior to any additional material placement within Plot areas
  - 3. Placement of ENR Material and ENR+AC Material in three separate one-acre test plots. One plot is located within a sub tidal area of the Waterway at approximately River Mile (RM) 1.13 to 1.23 within the Navigation Channel (Subtidal Plot), one within an intertidal area at approximately RM 3.84 to 3.94 along the easterly bank of the waterway (Intertidal Plot), and

one in a scour area at approximately RM 0.04 to 0.10 at the Ash Grove Cement berth area (Scour Plot). Placement of ENR or ENR +AC shall be performed using a rigid arm excavator with clamshell bucket (or similar as approved by the Project Representative (PR)) and real time navigation and positioning system (or approved equal) capable of real time positioning of clamshell bucket to +/-4 inch accuracy in X, Y and Z axes.

- a. ENR and ENR+AC Material shall be placed in a manner intended to limit mixing with underlying river sediments, limit segregation of the ENR or ENR+AC material during placement, limit winnowing/loss of the AC during placement, and accurately place the materials within the target areas at the target thickness with limited loss to adjacent areas.
  4. Multi-beam hydrographic surveying.
  5. All other work as defined in the Contract Documents.
- B. Accomplishment of Work in the Contract Documents shall meet all requirements of the Contract including timeframes specified by Section 01014.
- C. The above description is not intended to be complete. The work to be completed is provided in the entirety of the Contract Documents. The summary in this Section is not intended to relieve the Contractor of the responsibility for reading and understanding the Contract Documents.

### **1.03 SPECIFICATION LANGUAGE**

- A. Specifications are written mostly in imperative and streamlined form. Unless indicated otherwise, this imperative language is directed to the Contractor. Additionally, the words "shall be" shall be included by inference where a colon (:) is used within sentences or phrases.
1. Examples:
    - a. Aggregate: ASTM C33.
    - b. Adhesive: spread with notched trowel.
  - B. Related sections: Individual Specification sections may include a reference to other sections. Specification sections referenced are intended only to assist in identifying associated work and are not intended and shall not be considered to be all inclusive. The Contractor is responsible to perform all the work in the Contract Documents whether referenced in the specific specifications or not.
  - C. Whenever there is wording stating that an item is "as specified", "as shown", or "as indicated", the reference is to all the Contract Documents. Stating "as specified", "as shown", or "as indicated" does not refer necessarily to a Drawing or Specification, but it refers to either.
  - D. The words "Provide" and "Furnish" shall mean supplying, installing, and incorporating into the Work including all labor, materials, supplies and equipment necessary to do so. The word "Supply" shall mean to acquire, deliver and transfer the item to the County as specified.
  - E. Unless otherwise indicated, all specified materials and equipment incorporated into the Work shall be new and free of defects.

### **1.04 REFERENCED SPECIFICATION**

- A. Whenever a Specification in this Contract references the specifications of WSDOT or Local Jurisdiction, it is to define the technical standards to be met for this Contract; only the technical standards are referenced. Administrative provisions such as Measurement and Payment of the referenced specification shall not apply to this Contract in any instance.
- B. Federal, State and Local Laws, Statutes and Regulations are not individually referenced. This provision incorporates by reference the latest version of statutes, laws and regulations. In case of conflict between the requirements of the specifications and requirements of the statutes and regulations, the contractor shall bring them to the attention of the Project Representative. Lacking a specific response, the more stringent shall control. In no case can this contract be interpreted to override statutes and regulations of governing authorities.

- C. Whenever an industry code or standard is referenced and not specifically addressed in an individual specification, it is referenced to define the industry standard of quality for workmanship and materials

**PART 2 PRODUCTS**

NOT USED.

**PART 3 EXECUTION**

NOT USED.

**END OF SECTION**

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**SECTION 01012**  
**REFERENCE MATERIAL**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section lists reference materials relative to the project. Reference materials are provided for informational purposes only and are not to be considered Contract Documents.
- B. The documents are available on the Procurement Website for this Project at:  
<http://www.kingcounty.gov/procurement/>.
- C. For the work related to the Contract, the following are available reference materials:
  - a. AOC - ADMINISTRATIVE ORDER ON CONSENT FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY, USEPA Region 10 Docket # CERCLA-10-2001-0055
  - b. Candidate Plot Locations for Enhanced Natural Recovery-Activated Carbon Pilot Study, Lower Duwamish Waterway Group Memorandum to EPA and Washington Department of Ecology, July 24, 2014
  - c. Quality Assurance Project Plan: Enhanced Natural Recovery/Activated carbon Candidate Plot Surface and Subsurface Sediment Sampling for PCB Analyses for the Lower Duwamish Waterway Final, Submitted to EPA and Washington department of Ecology, October 24, 2014, prepared by Windward Environmental LLC for Lower Duwamish Waterway Group
  - d. Validated LDW Sediment Data for ENR-AC Pilot, Lower Duwamish Waterway Group Memorandum to EPA and Washington Department of Ecology, January 15, 2015
  - e. Final Plot Selections for Lower Duwamish Waterway Enhanced Natural Recovery-Activated Carbon Pilot Study, Lower Duwamish Waterway Group Memorandum to EPA and Washington Department of Ecology, February 3, 2015
  - f. Design Support Documents
    - i. Substantive Compliance Information
    - ii. Biological Evaluation
    - iii. Narrative Design Report
    - iv. Water Quality Monitoring Plan
    - v. Construction Quality Assurance Plan

**PART 2 PRODUCTS [NOT USED]**

**PART 3 EXECUTION [NOT USED]**

**END OF SECTION**

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**SECTION 01014**  
**MILESTONES AND CONSTRAINTS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies completion times, milestones, constraints and hours of work.
- B. Schedule and conduct all work in a manner consistent with the Contract, and comply with the construction scheduling requirements, Contract milestones and constraints on the Work as specified.
- C. This contract is divided into two Phases:
  - 1. Phase 1 includes preparation and confirmation of pre-construction submittals. Phase 1 NTP authorizes the Contractor to start with the preparation of submittals described below and their transmittal to the Project Representative (PR) according to the schedule in 1.02.
    - a. At a minimum, the Contractor shall submit the following submittals during Phase 1:
      - i Specification Section 01063 – Health and Safety 1.03 D Site Specific HASP
      - ii Specification Section 01300 – Schedule of Values
      - iii Specification Section 01311 – Progress Schedules and Reports 1.02 C Construction Schedule
      - iv Specification Section 01560—Environmental Management 1.03 B Environmental Protection Plan
      - v Specification Section 02221—Backfill 1.03 A, B and K Construction Work Plan, Contractor Quality Control Plan (CQCP), and Material information
      - vi AC material information and sample
    - b. Phase 1 Work shall be considered complete when Contractor receives the Project Representative confirmation in writing indicating ‘Review Action 1 or 2’ to the submittals described in 1.01, C 1.
    - c. As a condition precedent to issuing the Phase 2 NTP, the Contractor shall have completed the Work under Phase 1.
    - d. Contractor shall procure materials as necessary during Phase 1 once materials are approved by the Project Representative
  - 2. Phase 2 NTP authorizes the Contractor to begin mobilization, test placement, construction and to proceed with the Work of the Contract.

**1.02 COMPLETION TIMES**

- A. Achieve Substantial Completion of Phase 1 – Submittals Period, within 120 days after the effective date of Phase 1 Notice to Proceed.
- B. Achieve Substantial Completion of Phase 2 – Construction Period, within 120 days after the effective date of Phase 2 Notice to Proceed.
- C. Achieve Final Acceptance within the time specified by the Project Representative.

**1.03 CONSTRAINTS**

- A. In-water work shall be performed starting around November 29, 2016 and completed prior to February 15, 2017.

- B. No in-water work shall be performed during period of tribal fishing.

#### **1.04 HOURS OF WORK**

- A. Unless otherwise specified, conform with applicable jurisdictions and other pertinent ordinances regarding limitations on work hours or specific parts of the work.
- B. Hours of work may be further modified by Section 01062.
- C. Submit a schedule of planned working hours. Contractor shall typically plan on working 1 or 2 shifts per day, typically 10 hours per shift. Shifts shall be planned to coordinate with specific tidal periods or other conditions as necessary to safely and efficiently perform the work. King County Project Representative shall approve Contractors proposed work hours and may modify proposed schedule as appropriate. Hours per day may be variable and 10 hours per day are not guaranteed.
- D. Contractor shall not perform any work unless Project Representative or designee is onsite.
- E. Contractor shall provide notice at least 3 days in advance of any barge loading with project materials such that Project Representative or designee can be present.
- F. Work outside of the scheduled work hours requires approval by the Project Representative 72 hours prior to the start of such work.
  - 1. If the Contractor works unscheduled hours and/or if the Contractor has not obtained Project Representative's approval at least 72 hours prior to the start of unscheduled work, the contractor shall be liable for the costs of King County's overtime inspection at the rate of \$107 for each hour for each person performing such inspection for the County.

#### **PART 2 PRODUCTS**

NOT USED.

#### **PART 3 EXECUTION**

NOT USED.

**END OF SECTION**

## SECTION 01016

### LABOR MANAGEMENT PLAN PART 1 GENERAL

#### 1.01 SUMMARY

- A. This section specifies the requirement for submittal of a Labor Management Plan on Contracts with a Contract Price of one million dollars (\$1,000,000) or more at time of Contract execution by King County.

#### 1.02 CONTRACTOR RESPONSIBILITIES

- A. The Contractor acknowledges that because this is a time of the essence contract, any work stoppage, strike, slow down, picket or other disruptive activity which impacts the timely and accurate completion of the Project may cause the County significant economic damage.
- B. Contractor shall comply with the provisions set forth within Section 00700 - General Terms and Conditions, Article 10.6 - Notice to County of Labor Disputes.

#### 1.03 LABOR MANAGEMENT SUBMITTALS

- A. Contractor shall submit the following Labor Management Plan in accordance with Section 00700 - General Terms and Conditions, Article 4.4 - Submittals and Section 1300 Submittal Procedures within 10 days following the Notice to Proceed with Work.
- B. Provide a copy of the Contractor's collective bargaining agreements, if any, and their expiration dates.
- C. Provide Contractor's labor relations history for both County and non-County projects of similar to types of work set forth in Contract Documents for this Project for the last five years. Include the following detail:
  - 1. Name and dates of the project;
  - 2. Description of the project.
  - 3. Final cost of the construction contract for the project.
  - 4. Description of any work stoppage, strike, picket, slow down or other labor disruption that occurred on the project, if any.
  - 5. Description of impacts to contract price or schedule resulting from the labor disruption that occurred on the project, if any.
  - 6. Description of the labor management methods used by the Contractor to prevent, mitigate or eliminate a labor disruption on the project.
- D. Provide a description of any activities or events Contractor, or its Subcontractors, reasonably believe may cause a potential or actual work stoppage, strike, slow down or other labor disruption on the Project which may either (a) impact worker's performance at the Site or (b) impact the Contract Time or Contract Price for the Project.
- E. Provide the plan(s) the Contractor and its Subcontractors will follow to prevent, mitigate or eliminate labor disruptions if they occur on the Project. Provide copies of any policies and procedures which support this plan(s).

### PART 2 PRODUCTS

Not Used.

### PART 3 EXECUTION

Not Used.

END OF SECTION

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**SECTION 01025**  
**MEASUREMENT AND PAYMENT**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This section includes a description of the requirements and procedures for measurement of Work performed, the documentation required to verify that amount of Work, and procedures for obtaining payment for the Work performed.
- B. The Work, as described in the Construction Documents, for which payment will be made, is to be paid on a combination of Lump Sum, Unit Price for Materials and a Fully Loaded Daily (Shift) Rate as described in this section.
- C. Complete costs for performing all work required by the Contract Documents are to be included in the bid items. No additional payment items will be considered.

**1.02 BID MEASUREMENT AND PAYMENT**

The Bidding Schedule is divided into numerous bid items whose definitions follow. Bid Item Numbers 1 through 5 represent the entire scope of work covered by the Contract Documents and shall contain all costs to perform the work.

**A. Bid Item 1: Lower Duwamish Waterway Pilot Project – LUMP SUM**

- 1. The lump sum bid price for “Lower Duwamish Waterway Pilot Project” shall include all work shown and specified in the Contract Documents except Bid Items 2, 3, 4 and 5.
- 2. Measurement shall be in accordance with a reasonable apportionment of the work as established in the Schedule of Values.
- 3. Payment will be based upon the percentage of completion for each item in the Schedule of Values.

**B. Bid Item 2: ENR Material Delivered to Site – Unit Price (Tons)**

- 1. This bid item is for all work necessary for acquiring, blending, loading into barge and transporting to Site the ENR materials (four types total - sand, sand mixed with Granular Activated Carbon, Gravelly Sand, and Gravelly Sand mixed with Granular Activated Carbon).
- 2. Measurement shall be by ton of material delivered to Site.
- 3. Estimated quantities of ENR Materials (sand, sand mixed with Granular Activated Carbon, Gravelly Sand, and Gravelly Sand mixed with Granular Activated Carbon) are provided in 00300 (the bid form).
- 4. Contractor shall not exceed base quantities of materials without written approval by the King County Project Representative.

**C. Bid Item 3: Placement Method Demonstration and Calibration – DAILY RATE (10 Hour Day)**

- 1. The lump sum bid price for “Placement Method Demonstration and Calibration” shall include all personnel, equipment and materials (except ENR Material) to successfully perform Placement Method Demonstration and Calibration as specified in the Contract Documents. ENR Material for use in performing Bid Item 3 is included in Bid Item 2.
- 2. Payment will be based upon each 10 hour day (shift if working 2 shifts per day) or portion thereof (prorated based on 10 hour day), as approved by the Project Representative. This may be for hours less than or greater than 10 hour per day. For example if work 9 hours receive 90% of 10 hour rate. If work 11 hours receive 110% of 10 hour rate. Contractors planned work hours shall be pre-approved by Project Representative.



3. All work associated with this item is described in Specification Section 02221, 3.02.
4. Additional days beyond base quantity on bid form may be required as directed by Project Representative and will be paid at Daily Rate on Bid Form for Bid Item 3.

**D. Bid Item 4: Placement of Material – DAILY RATE (10 Hour Day)**

- A. This bid item is for fully burdened rates for all equipment and personnel necessary to properly, safely and efficiently perform the in water ENR material placement operations at the three plots.
- B. This bid item is for all work days (shifts) after successful completion of Bid Item 3 Placement Method Demonstration and Calibration where the following conditions are all met, as determined by the Project Representative;
  1. Contractor is actively and diligently performing the Work,
  2. Contractor is performing Work in accordance with schedule approved by King County Project Representative,
  3. Work is performed at the site,
  4. All necessary equipment for safe and efficient material placement is onsite and in good operating condition (including navigation and positioning system),
  5. Equipment is fully staffed for safe and proper operation,
  6. In water placement of material is the focus of the day's (shifts) activities. This includes work days (shifts) where no actual in water placement occurs but necessary preparation and support activities are effectively performed such as moving equipment from one Plot to another. This does not include days where only offsite work such as barge loading or similar is performed.
- C. No payment for major equipment failure or Contractors inability to properly and efficiently perform the work due to equipment shortages or malfunction, crew shortages or improper project planning.
- D. Payment will be based upon each 10 hour day (10 hour shift if working two shifts per day) or portion thereof (prorated based on 10 Hour Day) worked, this may be for hours less than or greater than 10 hours per day. For example if work 9 hours receive 90% of 10 hour rate. If work 11 hours receive 110% of 10 hour rate. Contractor shall not change or otherwise modify shift times from approved schedule without prior approval of Project Representative.
- E. The estimated quantity of days (shifts) is provided in 00300 (the bid form).

**E. Bid Item 5: County Directed Standby DAILY RATE (10 Hour Day)**

- A. This bid item is for King County directed project standby for days (shifts) when Contractor is not to perform any work for that shift. Contractor shall not be required to have project staffed on County directed standby shifts.
  1. Measurement will be in shift (10 hour) increments.
  2. Contractor shall be given notice of intended standby for upcoming shift no less than 12 hours in advance of typical shift start time.
  3. Stand-by time does not include schedule impacts due to:
    - a. Ongoing commercial activities at berth
    - b. Tribal Fishing delays
    - c. Adverse weather
    - d. Equipment breakdown or damage

- B. Payment for Stand-By will be made at the contract unit price per shift as stated in the Bid Form and shall constitute full compensation for all labor, materials, tools, and equipment necessary for stand-by period.

**PART 2 MATERIALS**

Not Used

**PART 3 EXECUTION**

Not Used

**END OF SECTION**

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**SECTION 01050**  
**SURVEY INFORMATION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies survey work requirements.

**1.02 QUALITY ASSURANCE**

- A. Referenced Standards: This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.
  - 1. Washington State requirements for Professional Land Surveying
  - 2. NOAA Hydrographer Certification
  - 3. USACE Hydrographic Surveying Manual (EM 1110-2-1003, 11/30/2013, US Army Corps of Engineers)

**1.03 SUBMITTALS**

- A. Procedures: Specification Section 01300.
- B. Qualifications of the hydrographic surveyor.
- C. Description of proposed hydrographic survey system and all equipment and procedures to be used for data collection and data processing.
- D. Hydrographic surveys as required.
  - a. Initial hydrographic multibeam survey prior to any material placement to show current condition and elevations of each sub plot or test placement area (pre-placement survey).
  - b. Daily hydrographic multibeam surveys to record progress and monitor placement thickness and coverage.
  - c. As-Built multi beam hydrographic survey of each sub plot. And test placement area.

**1.04 SURVEY BY KING COUNTY**

- A. Hydrographic survey data showing pre-existing condition of each sub plot is shown on Plans included in the Contract Documents.
- B. County will establish temporary control points in the vicinity of each plot in a relatively accessible area. This may be on the adjacent or nearby uplands or on a piling or other offshore structure. Approximate locations (subject to change) are shown on the Plans. It may be necessary to access points from uplands or from water depending upon final locations.

**1.05 SURVEY BY CONTRACTOR**

- A. All hydrographic surveys shall be performed in accordance with USACE Hydrographic Survey Manual, EM 1110-2-1003, 11/30/2013. Appropriate equipment testing including bar tests (or similar) shall be performed before and after each survey.
- B. The Contractor shall perform a multibeam hydrographic survey no more than 30 and not less than 3 days prior to starting the in water placement at each test placement area or sub plot to establish the pre-placement bathymetry of the test placement area or sub plot and to identify any significant changes (i.e. holes, slope changes, depth changes, additional structures) to pre-existing condition that may impact approach of construction.
- C. Complete daily multibeam hydrographic surveys to monitor progress and placement thickness of material. Submit results of such surveys as plan view and cross sections showing comparison to

pre-placement elevations to the King County Project Representative (KCPR) in pdf and electronic format (AutoCAD and XYZ point file) within 24 hours of performance. Contractor to include tabulated XY file of all locations where spuds were set (placed in contact with waterway bed) within the subplot.

- D. Complete additional multi beam hydrographic surveys as requested by the Project Representative and as required for the Work.
- E. Maintain and preserve all stakes and other marks established until authorized by the Project Representative to remove them. (Does not apply to break away grade stakes installed by County in sub plots for thickness monitoring).
- F. Comply with the survey requirements for all monitoring as specified in other Specification Sections.
- G. Provide new replacement monuments and boxes when removed or damaged during construction.
- H. Re-establish all permanent survey control monuments prior to final inspection.
- I. Surveys shall be performed and data processed to provide a minimum of 1 data point per square foot of surveyed area.
- J. Complete as-built multibeam hydrographic surveys to document final elevations within sub plots and test placement areas. Perform field survey for as built within 3 days of request from King County Project Representative. Submit results of such surveys as plan view and cross sections showing comparison to pre-placement elevations to KCPR in pdf and electronic format (AutoCAD and XYZ point file) within 24 hours of performance.
- K. Provide all requirements of the record drawings (as-builts) per Specification Section 01720.

#### **1.06 SURVEYOR QUALIFICATIONS**

- A. Surveyor shall be a NOAA Certified hydrographic surveyor or a Professional Land Surveyor who is licensed in the state of Washington with demonstrated experience in multibeam hydrographic surveying.
- B. The Project Representative reserves the right to disallow the person(s) selected by the Contractor for surveying if in the Project Representative's opinion the person is not qualified to do the work.
- C. Project Representative may observe performance of hydrographic surveys at any time. Contractor shall make such access to survey vessel available as requested by the Project representative.

#### **PART 2 PRODUCTS**

NOT USED.

#### **PART 3 EXECUTION**

##### **3.01 GENERAL**

- A. Perform surveys based on control points as shown on the Drawings. Use surveys to establish elevation of sediment surface, mudline elevations at stake locations, and other reference and construction points.
- B. Replaced monuments shall be set by a licensed surveyor, registered in the State of Washington.
- C. All surveys shall be performed in conformance with USACE Hydrographic Survey Manual (EM 1110-2-1003, 11/30/2013, US Army Corps of Engineers).
- D. Data shall be processed to a density no less than one data point per square foot for all multibeam hydrographic surveys.
- E. Surveys shall cover a minimum of 30' beyond subplots (unless prevented by obstructions), including the test placement plots and the potential excess material placement area as shown on

the Plans.

- F. Follow decontamination procedures should any equipment come into contact with sediment while performing survey.

**END OF SECTION**

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**SECTION 01062**  
**PERMITS, EASEMENTS, FEDERAL ENDANGERED SPECIES ACT**  
**AND RIGHT OF ENTRY AGREEMENTS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies substantive compliance, right-of-entry agreement requirements, and other approvals.

**1.02 PERMITS (SUBSTANTIVE COMPLIANCE)**

- A. This project is under the jurisdiction of the United States Environmental Protection Agency, Region 10, and the Washington Department of Ecology under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
1. Under CERCLA, the project is exempt from permitting requirements but must demonstrate substantive compliance with federal, state and local regulations.
  2. The County has fulfilled substantive requirements for the following permits and approvals:
    - a. USACE Section 408
    - b. USACE Section 10 & 404 Permits
    - c. Federal Endangered Species Act (ESA) Section 7 Consultation (BE)
    - d. Section 401 Water Quality Memo (Date TBD)
    - e. Washington State Coastal Zone Management Approval
    - f. WDFW Hydraulic Project Approval
    - g. City of Seattle Shoreline Substantial Development Permit
    - h. City of Tukwila Shoreline Substantial Development Permit
  3. Substantive compliance documents include the following:
    - a. 401 Water Quality Memo (pending)
    - b. 408 Navigation Memo (pending)
    - c. US Fish and Wildlife Service ESA Section 7 Concurrence Letter
    - d. National Oceanic and Atmospheric Administration ESA Section 7 Concurrence Letter
- B. Copies of the substantive compliance documents obtained by the County are listed in 1.02 A 3 of this Section and included in Attachment A to this Section. Unless otherwise indicated, the terms, conditions and requirements of all substantive compliance documents listed in Part 1.02 A are requirements of this Contract and the Contractor shall be responsible for implementation of all terms and conditions.
- C. In addition to the substantive compliance documentation obtained by the County and included in this Contract (if any), the Contractor shall obtain from the Authority Having Jurisdiction all other permits or documents required to perform the Contract Work. The Contractor shall obtain the needed approvals in accordance with Section 00700.

**1.03 RIGHT-OF-ENTRY AGREEMENTS**

- A. The County has acquired the following easements and right-of-entry agreements:
1. Port of Seattle right-of-entry for in-water work.
  2. WA State Department of Natural Resources right-of-entry for in-water work



3. LaFarge right-of-entry for survey control.
  4. AshGrove right-of-entry for survey control (pending).
- B. Copies of the right-of-entry agreements obtained by the County are included in Attachment B to this Section. Unless otherwise indicated, the terms, conditions and requirement of all easements and right-of-entry agreements included in Attachment B are requirements of this Contract and the Contractor shall comply with the terms, conditions and requirements contained in each easement and right of entry agreement.
  - C. The Contractor must include in the Baseline Schedule (as required in Section 01311) a dedicated activity for the Contractor to obtain each of the easements and/or right-of-entry agreements required to perform the Contract Work.
  - D. The County will provided to the Contractor the following right-of-entry agreements after execution of the Contract. The Contractor shall comply with the requirements of each easement. For the purposes of bidding the Contract shall assume the following requirements for each easement and/or right-of-entry agreement.
    1. Right of entries for upland property access for survey control (pending)

#### **1.04 PERMITS, EASEMENTS AND RIGHT-OF-ENTRY AGREEMENTS OBTAINED BY CONTRACTOR**

- A. Prepare and submit to the proper authority or owner all information required for access onto the following properties:
  1. Notification of in-water work at barging facilities
- B. Obtain from the Authority Having Jurisdiction all other easements and/or right-of-entry agreements required to perform the Contract Work.
  1. Haul routes
  2. Upland property access including docks (except for survey work as listed in G below).
- C. Provide a copy of substantive requirements, easement and right of entry agreement to the Project Representative prior to pursuing any Work covered by the permit or easement.
- D. When required, the Work shall be inspected as required by the issuing owner or agency (this is the owner or agency that issued the specific Permit, Easement or Right of Entry Agreement).
- E. Provide a copy of the approval with the issuing agency acceptance or easement owner release.
- F. Include in the Baseline Schedule the time to prepare, submit and obtain all Contractor obtained approvals, easements and right-of-entry agreements.

#### **1.05 SUBMITTALS**

- A. Procedures: Specification Section 01300.
- B. Substantive requirements, easements and right-of-entry agreements obtained by the Contractor.
- C. All substantive requirements, easement or right-of-entry agreement compliance reports.
- D. Contractor obtained approvals when work is complete.

#### **1.06 CONSTRUCTION RESTORATION ACCEPTANCE FORM**

- A. Whenever Work is performed on property other than street right of way, provide a written easement restoration acceptance form from the easement grantor or easement grantors agent for each property, parcel, or area certifying that the restoration of structures and/or surfaces has

been completed to the satisfaction of the property owner, and that the owner has no claims for damages on account of such restoration.

- B. The easement restoration acceptance shall comply with the requirements as set forth in the form provided by the Project Representative. If, in the opinion of the Project Representative, the release is unreasonably withheld by the easement owner, the County may, at its sole discretion, not require the easement restoration acceptance to be completed.

**PART 2 PRODUCTS**

**NOT USED**

**PART 3 EXECUTION**

**NOT USED**

**END OF SECTION**

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**Specification Section 01062**

**Attachment A**

**Substantive Compliance**

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# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office  
510 Desmond Dr. SE, Suite 102  
Lacey, Washington 98503



JUL 23 2015

In Reply Refer To:  
**01EWF00-2015-I-0752**

Allison Hiltner, Remedial Project Manager  
U.S. Environmental Protection Agency, Region 10  
1200 Sixth Avenue, Suite 900  
Seattle, Washington 98101-3140

Dear Ms. Hiltner:

Subject: Lower Duwamish Enhanced Natural Recovery/Activated Carbon Pilot

This letter is in response to your June 24, 2015, request for our concurrence with your determination that the proposed action in the Lower Duwamish Waterway (LDW), King County, Washington, "may affect, but is not likely to adversely affect" federally listed species. We received your letter and Draft Biological Evaluation, providing information in support of "may affect, not likely to adversely affect" determinations, on July 6, 2015.

As required by the Environmental Protection Agency, the Lower Duwamish Waterway Group (LDWG) proposes to conduct a pilot study of using enhanced natural recovery (ENR) material amended with activated carbon (AC) to reduce the bioavailability of polychlorinated biphenyls (PCBs) in the LDW. The proposed action entails placing an average of 9 inches of ENR material, with and without AC over the existing sediment in three 1-acre plots using a barge-mounted fixed-arm excavator with a clamshell bucket for submerged placement of the material. In-water construction will take place over 2 to 4 weeks during the in-water work window between October 1, 2016 and February 15, 2017. Ongoing monitoring of the action includes collection of surficial sediment samples, sediment profile imaging, and using passive water quality stations.

Specifically, you requested informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) for the federally listed species and critical habitat identified below.

- Bull trout (*Salvelinus confluentus*)
- Bull trout critical habitat

We believe that sufficient information has been provided to determine the effects of the proposed action and to conclude whether it would adversely affect federally listed species and/or designated critical habitat. Our concurrence is based on information provided by the action

agency, best available science, and complete and successful implementation of agreed-upon conservation measures.

## **EFFECTS TO BULL TROUT**

### Effects and Disturbance

Temporary and/or long-term effects from the action are not expected to measurably disrupt normal bull trout behaviors (i.e., the ability to successfully feed, move, and/or shelter), and are therefore considered insignificant and/or discountable:

- The action is located in Green/Duwamish River below Tacoma's Headworks Diversion Dam where, at present, bull trout occurrence is rare or unlikely.
- The action will occur during the recommended in-water work window (October 1 to February 15), when bull trout are least likely to be present in the project area.
- The action will result in temporary impacts to water quality, including potential temporary increases in elevated levels of turbidity and chemicals. These effects will be intermittent and limited in physical extent and duration.

### Effects to Bull Trout Habitat and Prey Sources

With successful implementation of the agreed-upon conservation measures, we expect that temporary impacts from the action will not measurably degrade or diminish habitat functions or prey resources in the action area, and effects are therefore considered insignificant and/or discountable:

- Construction methods and proposed permanent features may impact habitat that supports bull trout and/or their prey sources. These impacts will be limited in physical extent and/or duration, and will not measurably degrade habitat functions, including prey resources, that are important to bull trout within the action area:
  - The action will result in limited temporary and/or permanent impacts to native substrates, aquatic vegetation, the benthic invertebrate community, and complexity of instream or marine nearshore habitat. However, the action includes conservation measures, and/or a restoration component, which at least partially offset the action's unavoidable impacts to bull trout habitat and/or prey resources.
  - Sediment cleanup activities may result in periodic and/or temporary impacts to water quality through elevated levels of turbidity, and chemicals (e.g. activated carbon); however, these effects will be intermittent and of short duration.
  - This is a pilot study and active cleanup site.

## EFFECTS TO BULL TROUT CRITICAL HABITAT

The final revised rule designating bull trout critical habitat (75 FR 63898 [October 18, 2010]) identifies nine Primary Constituent Elements (PCEs) essential for the conservation of the species. The proposed action may affect the PCEs listed below; however, effects to these PCEs are not expected measurably affect them and are therefore considered insignificant or discountable:

PCE 1: *Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.*

- The action will have no effect on this PCE.

PCE 2: *Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.*

- The action may temporarily introduce an impediment or barrier within migration habitat; however, it will not preclude bull trout movement through the area, either during or after construction, and any effects will be temporary. The migration habitat will not be permanently altered, destroyed, or degraded.

PCE 3: *An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

- The action may temporarily reduce the food base via a small reduction of prey resources, degradation of aquatic habitat, and/or removal or alteration of riparian vegetation. However, the impacts will be temporary and/or components of the project design will avoid, reduce, or compensate for them.

PCE 4: *Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*

- The project will result in temporary impacts to substrates, but will not alter habitat complexity in the project area.

PCE 5: *Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.*

- The action will have no effect on this PCE.



PCE 7: *A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.*

- The action will have no effect on this PCE.

PCE 8: *Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

- The action may impact water quantity and/or quality. However, the effects will be temporary; components of the project design include actions to avoid, reduce, or compensate for the effects from the impacts; and/or we would be unable to meaningfully measure, detect, or evaluate the effects.

### Conclusion

This concludes consultation pursuant to the regulations implementing the Endangered Species Act (50 CFR 402.13). Our review and concurrence with your effect determination is based on the implementation of the project as described. It is the responsibility of the Federal action agency to ensure that projects that they authorize or carry out are in compliance with the regulatory permit and/or the Endangered Species Act, respectively. If a permittee or the Federal action agency deviates from the measures outlined in a permit or project description, the Federal action agency has the obligation to reinitiate consultation and comply with section 7(d).

This project should be re-analyzed and re-initiation may be necessary if 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation, 2) if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or 3) a new species is listed or critical habitat is designated that may be affected by this project.

This letter and its enclosures constitute a complete response by the U.S. Fish and Wildlife Service to your request for informal consultation. A complete record of this consultation is on file at the Washington Fish and Wildlife Office, in Lacey, Washington. If you have any questions about this letter or our joint responsibilities under the Endangered Species Act, please contact the consulting biologist identified below.

U.S. Fish and Wildlife Service Consultation Biologist:  
Lee Corum (360-753-5835)

Sincerely,

*Marsha L. Lense*

*EL*

Eric V. Rickerson, State Supervisor  
Washington Fish and Wildlife Office



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE**  
West Coast Region  
7600 Sand Point Way N.E., Bldg. 1  
Seattle, Washington 98115

Refer to NMFS No:  
WCR-2015-2949

July 9, 2015

Dennis McLerran  
Regional Administrator  
United State Environmental Protection Agency  
Region 10  
1200 Sixth Avenue, Ste 900  
Seattle, WA 98101-3140

Attn: Allison Hiltner

Re: Endangered Species Act Section 7 Informal Consultation for conducting a Lower Duwamish Waterway Enhanced Natural Recovery/Activated Carbon Pilot Study in the Lower Duwamish Waterway in Seattle, King County, Washington (6<sup>th</sup> Field HUC 171100190203 and 171100130305, Lat: 47.569, Long: -122.346; Lat: 47.553, Long: -122.342; and Lat 47.523, Long: -122.307).

Dear Mr. McLerran:

On June 26, 2015, the National Marine Fisheries Service (NMFS) received your request for a written concurrence that the US Environmental Protection Agency (EPA) proposed action to perform a pilot study on capping for enhanced natural recover and activated carbon for the containment of contaminants in the Lower Duwamish Waterway is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). The EPA is conducting the project under the authority and responsibility granted by a 2014 amended Administrative Order on Consent under the Comprehensive Environmental Response, Compensation, and Liability Act. This response to your request was prepared by NMFS pursuant section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.<sup>1</sup>

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination that you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to

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<sup>1</sup> Memorandum from D. Robert Lohn, Regional Administrator, to ESA consultation biologists (guidance on informal consultation and preparation of letters of concurrence) (January 30, 2006).



complete EFH consultation.<sup>2</sup> The EPA did not request EFH consultation, and NMFS determined that the proposed action would have no adverse effect on EFH, and therefore is not conducting an MSA/EFH consultation at this time.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal year 2001, Public Law 106-554). A complete record of this consultation is on file at Oregon-Washington Coastal Office in Lacey, Washington.

### **Proposed Actions and the Action Areas**

The EPA, in partnership with the Lower Duwamish Waterway Group is proposing to conduct a pilot study in the Lower Duwamish Waterway to test the comparative efficacy of enhanced natural recovery (ENR) caps and the use of activated carbon plus enhanced natural recovery (ENR+AC) caps for isolating contaminants in the substrate at sites contaminated with polychlorinated biphenyls (PCBs) and other materials. The study will consist of three pairs of plots located in three separate areas of the Lower Duwamish Waterway: intertidal, subtidal, and scour plots. Each plot is approximately ½ acre in size, for a total of 3 acres of test area. All plots will use ENR materials consisting of a gravel sand mixture (100 percent grain size less than 1.5 inches, and approximately 50 percent sand). One of the two plots at each location will also contain granular activated carbon at a concentration of 1 to 3 percent. ENR and ENR+AC materials will be placed by a barge mounted fixed-arm excavator with a clamshell bucket, which will release materials within a few feet of the substrate to minimize suspension of sediments and loss of activated carbon. The thickness of the ENR and ENR+AC will be a minimum of 6 inches, with an average thickness of 9 inches. Work will be conducted between October 1 and February 15 of the 2016-2017 work window to avoid periods when listed salmonids are likely to be present, and is expected to take 2 – 4 weeks to complete. The study plots will be tested with sediment and water sampling before and after cap placement activities to test the chemical, physical, and biological properties and any changes resulting from the study which will be reported to the EPA and Washington Department of Ecology. The project will use all best management practices as described in the BE, and no dredging will occur for this proposed action.

There are no interrelated or interdependent actions associated with this proposed action.

The proposed action is located at three separate sites along the Lower Duwamish Waterway in Seattle, King County, Washington (Scour Plot: 6<sup>th</sup> Field HUC 171100190203, Lat: 47.569, Long: -122.346, Subtidal and Intertidal Plots: 6<sup>th</sup> Field HUC 171100130305, Lat: 47.553, Long: -122.342 and Lat 47.523, Long: -122.307). The action area is determined by the greatest effects stemming from the project, in this case increased suspended sediments from ENR and ENR+AC placement. Increased sediments may extend downstream up to 500 feet from the project

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<sup>2</sup> Memorandum from William T. Hogarth, Acting Administrator for Fisheries, to Regional Administrators (national finding for use of Endangered Species Act section 7 consultation process to complete essential fish habitat consultations) (February 28, 2001).

locations for a total action area of approximately 10 acres of estuarine waters. There is no documented forage fish spawning or submerged aquatic vegetation in the action area.

**Consultation History**

The EPA gave Biological Evaluations (BE) and MFS to NMFS for the project referenced above on June 26, 2015, with enough information to initiate informal consultation on that date. The EPA requested concurrence with the determinations of “may affect, not like to adversely affect” for Puget Sound Chinook salmon and PS steelhead trout, or designated critical habitat for PS Chinook salmon. A complete record of this consultation is on file at the Oregon and Washington Coastal Area Office in Lacey, Washington.

Table 1: Species considered in this consultation.

Species	Status	Listing	Date	Critical Habitat	Date
				Designation	
Puget Sound Chinook	Threatened	64 FR 14308	3/24/1999	70 FR 52630	9/2/2005
Puget Sound Steelhead	Threatened	72 FR 26722	6/11/2007	Proposed (78 FR 2725)	1/14/2013

**ENDANGERED SPECIES ACT**

**Effects of the Action**

For purposes of the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is NLAA listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial.<sup>3</sup> Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

The action area is estuarine habitat for salmonids. However, based on life-history studies for salmonids summarized in the Regional Nearshore and Marine Aspects of Salmon Recovery in Puget Sound (2005) and related documents, we believe PS Chinook salmon and PS steelhead trout are very unlikely to be in the action area concurrent with capping activities. For listed salmonids, the work window (October 1 to February 15) avoids periods when salmonids are likely to be in the action area. Salmon grow rapidly in their first several months of life and emigrate towards the ocean (ocean type Chinook) or rear in riverine habitat and leave the watershed as subadults (stream type Chinook and steelhead). In either case, juvenile salmonids are generally not present in estuarine habitat during the work window for the proposed action. Additionally, the action area is a highly developed industrial waterway with low quality habitat and few habitat features that would support rearing, making juvenile salmonid presence even less likely. The work window also avoids periods when listed adult Chinook salmon and steelhead trout return to the river as adults.

<sup>3</sup> U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conferences. March, 1998. Final. p. 3-12.

The effects of the action are reasonably likely to include: increased suspended sediments from ENR and ENR+AC placement, disturbance to the benthic community from placement of capping materials, and water quality improvement from isolation of contaminated sediment from the water column.

For ESA listed species, the primary potential for, at most, minor effects is through increased suspended sediments. The project will result in increases in suspended sediments when placing ENR and ENR+AC materials over the 2 – 4 weeks that capping will occur. However, because the capping material will consist almost entirely of gravels and sands, the increases in suspended sediments will be localized and rapidly settle out of the water column, and will not occur for sufficient duration and at increased suspended levels as to pose a risk of injury to listed species. Activated carbon at low levels in the capped material is believed inert for bitoa.

Based on the above information, and the information contained in the BE provided by the EPA, the potential for effects on listed fishes is discountable.

The action area for the proposed action contains estuarine critical habitat for PS Chinook salmon. Water quality will be slightly affected by increased suspended sediment during ENR and ENR+AC placement activities, and those changes will occur for up to a four week period. However, suspended sediment is not expected to rise to levels that significantly reduce opportunity for forage, growth, and maturation for ESA-listed species: sediment levels are expected to return to background within a few hours of activities ceasing. The proposed study will also impact the benthic community, causing a temporary decrease in abundance of benthic organisms from burial. Many benthic organisms will be able to survive burial of 9 inches of material, and the activated carbon is expected to have no effect on organisms. The benthic community is expected to rapidly recover (Dernie et al. 2002), and will have no impact on prey availability or forage opportunities for PS Chinook salmon. The proposed action will also improve water quality through isolating contaminants in the sediment, and will reduce the accumulation of those contaminants in the food chain that would have the potential to impact listed species through food web linkages. There is no submerged aquatic vegetation at the project locations that will be affected by the proposed action. Thus, there will be minimal if any impact on the function of the primary constituent elements for salmon critical habitat, and the potential for effects on critical habitat function is insignificant.

## **Conclusion**

Based on the above analysis, NMFS concludes that all potential effects of the proposed action are discountable or insignificant, and concurs with the EPA that proposed pilot study is not likely to adversely affect the subject ESA listed species or designated critical habitat.

## **Reinitiation of Consultation**

Reinitiation of consultation is required and shall be requested by the Federal agency, or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified

action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

This concludes consultation under the ESA. If you have questions concerning these consultations, please contact Zach Hughes of the Oregon and Washington Coastal Office at 360-753-6052, or by e-mail at zach.hughes@noaa.gov.

Sincerely,



for

William W. Stelle, Jr.  
Regional Administrator

cc: Allison Hiltner, Environmental Protection Agency  
Hiltner.Allison@epa.gov

## References

Dernie, K.M., M.J. Kaiser, E.A. Richardson, and R.M. Warwick. 2003. Recovery of Soft Sediment Communities and Habitats Following Physical Disturbance. *Journal of Experimental Marine Biology and Ecology*. 286: 415-434

Puget Sound Action Team. 2005. *Regional Nearshore and Marine Aspects of Salmon Recovery in Puget Sound*. Puget Sound Action Team. 246pp.

**Specification Section 01062**

**Attachment B**

**Right-of-Entry Agreements**



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P.O. Box 1209  
Seattle, WA 98111-1209

Tel: (206) 787-3000  
Fax: (206) 787-3381

[www.portseattle.org](http://www.portseattle.org)

March 10, 2015

Pamela Erstad  
King County Water Quality Planner/Program Manager IV  
Regulatory Compliance & Land Acquisition Services  
Wastewater Treatment Division  
201 South Jackson Street, Suite 505  
Seattle, WA 98104-3855

Dear Ms. Erstad,

This letter is in response to King County's request for access authorization for submerged land in the Lower Duwamish Waterway (the "LDW") for the purpose of work required for an Enhanced Natural Recovery-Activated Carbon Pilot Study (the "Study").

The Study is being carried out by the Port of Seattle, City of Seattle, King County and the Boeing Company (collectively, the Lower Duwamish Waterway Group, or "LDWG") pursuant to an amendment to the U.S. Environmental Protection Agency and Washington Department of Ecology Administrative Order on Consent for the LDW Remedial Investigation/Feasibility Study (Second Amendment to CERCLA Docket No. 10-2001-0055). The Study will evaluate the effect of applying activated carbon to *in situ* contaminated sediments in plots at three LDW locations. King County is the contracting agent for the LDWG parties and is responsible for securing access on behalf of the contractor that will be performing the field work for the Study.

Ownership interests in the LDW property on which the Study will take place are unclear due to a variety of factors and the Port may, in fact, have no such interests for the Study plot locations. However, to the extent the Port has ownership interests in the submerged land at the three locations in the LDW where the Study will occur, the Port authorizes access and use of the submerged lands at those locations for all LDWG parties, including King County and its contractor to carry out the Study.

Sincerely,



Joe McWilliams  
Managing Director, Real Estate Director

cc: Brian Anderson, The Boeing Company  
Allison Crowely, Seattle City Light  
Dave Schuchardt, Seattle Public Utilities  
Jeff Stern, King County



April 27, 2015

Pamela Erstad, Program Manager  
Regulatory Compliance & Land Acquisition Services  
Wastewater Treatment Division  
201 South Jackson Street, Suite 505  
Seattle Washington 98104-3855

Dear Ms. Erstad:

I am writing in response to the County's request for access authorization for submerged land in the Lower Duwamish Waterway (the "LDW") for the purpose of work required for an Enhanced Natural Recovery-Activated Carbon Pilot Study (the "Study"). The Study is being carried out by the Port of Seattle, City of Seattle, King County and the Boeing Company (collectively, the Lower Duwamish Waterway Group, or "LDWG") pursuant to an amendment to the U.S. Environmental Protection Agency and Washington Department of Ecology Administrative Order on Consent for the LDW Remedial Investigation/Feasibility Study (Second Amendment to CERCLA Docket No. 10-2001-0055). The Study will evaluate the effect of applying activated carbon to *in situ* contaminated sediments in plots at three LDW locations. The County is the contracting agent for the LDWG parties and is responsible for securing access on behalf of the contractor that will be performing the field work for the Study.

Ownership interests in property on which the Study will take place are unclear due to a complex historical record and conflicting documentation. To the extent the State has ownership interests in the submerged land at the three locations in the LDW where the Study will take place, the Department of Natural Resources authorizes access and use of the submerged lands at those locations for all LDWG parties, including King County and its contractor, to carry out the Study.

Sincerely,

Kristin Swenddal, Manager  
Aquatic Resources Division

**RIGHT OF ENTRY AGREEMENT**

**Property Owner:** Lafarge Corp.  
**Parcel Number:** 192404-9003  
**Property Address:** 5400 WEST MARGINAL WAY SW 98106

The undersigned property owner(s) or representative(s), hereinafter called the "Grantor", hereby grants a right of entry to King County, including its employees, contractors, consultants, invitees, and assigns to:

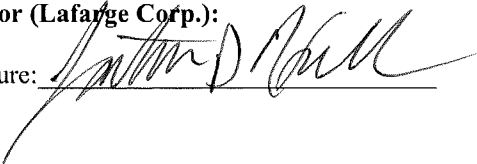
1. Survey in, and set a control point on or near dock face (Exhibit A.)  
Access a control point as necessary to calibrate equipment operating within the Duwamish Waterway for the proposed Enhanced Natural Recovery/Activated Carbon Pilot Study. It is anticipated that such control point will need to be accessed daily for an approximate 2 week period during December 1, 2016 thru February 15, 2017.  
Access to the temporary control point may be needed from land or water approach.


This work shall be administered by King County and is subject to the following conditions:

1. This Right of Entry shall be in effect beginning October 1, 2016 and ending no later than February 15, 2017. King County shall provide at least 48 hours' notice (by email or phone call to Grantor's designee) prior to accessing the Property. Unless the term of this Right of Entry is extended by the parties hereto, this Right of Entry shall automatically terminate at the end of the period stated above without further action by the Grantor or King County.
2. If work activities require installing temporary control points, King County shall restore the surface of property disturbed by King County in installing the temporary control points as nearly as possible to the condition in which it existed at the commencement of this Right of Entry Agreement or leave such control point in place as set if approved by Owner.
3. Access to the site shall be in accordance with Lafarge policy and Lafarge safety training. All King County representatives must complete the Lafarge Safety Orientation Computer Based Training and complete a site walk through. All King County representatives must check in with the assigned Lafarge Contractor Coordinators prior to entering the property and when leaving for each visit. The assigned Lafarge Contractor Coordinators are: 1. Mike Depew (206) 380-7601; 2. Coy McElderry (206) 730-5199; 3. Jonathan Hall (206) 661-8240. The King County representatives must park in the designated area, and sign in on the contractor sign-in sheet.
4. King County agrees to defend, save and hold harmless Grantor from all claims, actions, costs, damages or expense of any nature whatsoever (including reasonable attorneys' fees and costs) for injuries, sickness or death of persons, or any damage to property caused by the negligent acts or omissions of King County, its agents or employees, in its use of this Right of Entry. This obligation does not include such claims, actions, costs, damages or expenses which may be caused by the sole negligence of the Grantor and provided further that if the claims, actions, costs, damages or expenses are caused by or result from the concurrent negligence of (a) the Grantor and/or its agents or employees and (b) King County, its agents or employees, or involves those actions covered by RCW 4.24.115, then this defense and hold harmless provision shall be valid and enforceable only to the extent of the negligence of the King County, its employees, contractors, consultants, invitees, or assigns.

Dated this 17 day of Nov, 2015

**ACCEPTED AND APPROVED:**

**Grantor (Lafarge Corp.):**  
Signature: 

**King County:**  
Signature: 

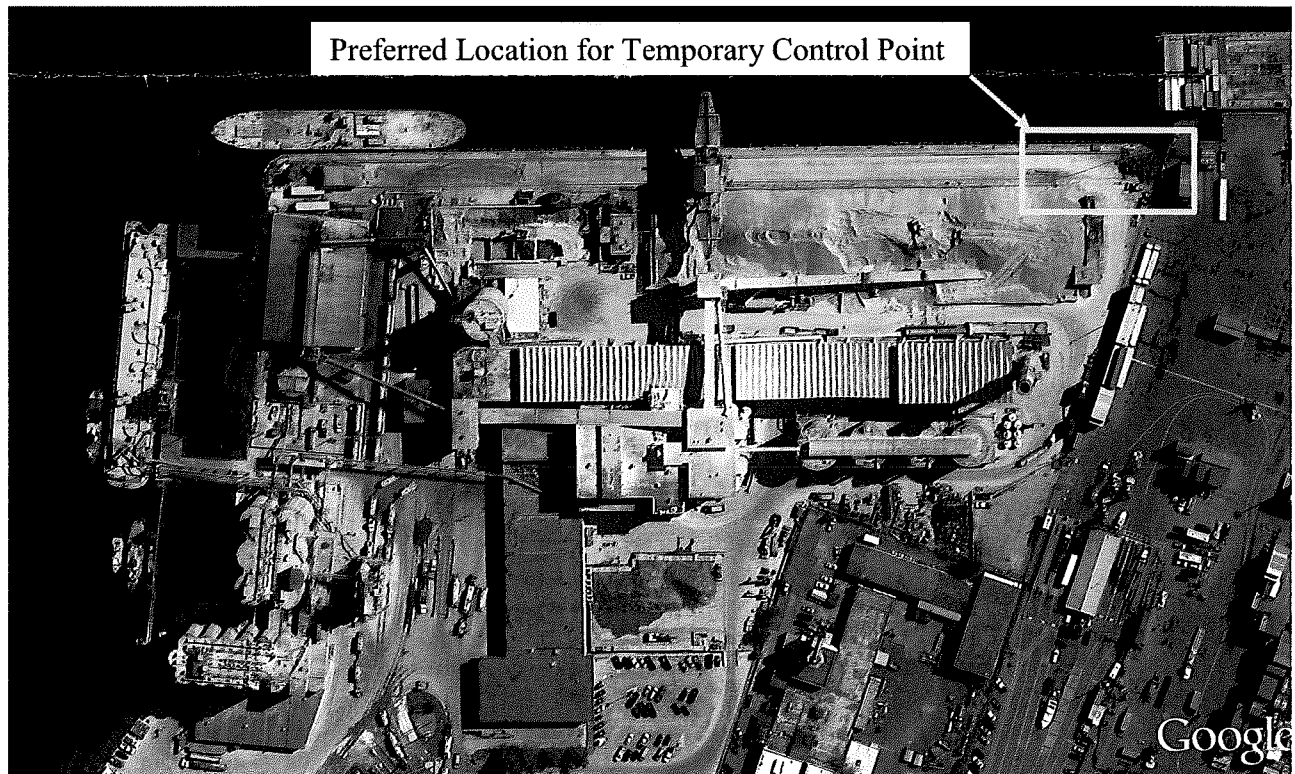
Printed Name: Jonathan Hall

Its: Operations Manager

Printed Name: Pamela Elsted

Its: Water Quality Planner / Program Manager

Exhibit A.



**Specification Section 01062**

**Attachment C**

**Construction Restoration Acceptance Form**

**01062-A CONSTRUCTION RESTORATION ACCEPTANCE FORM**

CONSTRUCTION CONTRACT NO. C \_\_\_\_\_ C

EASEMENT NAME \_\_\_\_\_  
(Easement Name as identified in the Contract Documents)

EASEMENT GRANTOR: \_\_\_\_\_

EASEMENT AUTHORIZED REPRESENTATIVE: \_\_\_\_\_

DATE CONTRACTOR ON SITE: \_\_\_\_\_

DATE CONTRACTOR OFF SITE: \_\_\_\_\_

**EASEMENT REPRESENTATIVE'S APPROVAL OF RESTORATION**

I/We, the undersigned Owner(s) or Representatives of property identified as

\_\_\_\_\_  
(Address or Property Description)  
\_\_\_\_\_  
\_\_\_\_\_

accept as complete the restoration work pursuant to the Easement requirements.

BY REPRESENTATIVE: \_\_\_\_\_ DATE \_\_\_\_\_

BY REPRESENTATIVE: \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACTOR SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

**SECTION 01063**  
**HEALTH AND SAFETY**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies procedures for complying with applicable laws and regulations related to worker safety and health. Adhere to applicable federal, state and local safety and health standards
- B. It is not the intent of the County to develop, manage, direct, and administer the safety and health programs of contractors or in any way assume the responsibility for the safety and health of their employees.
- C. It is not the intent of King County to list and identify applicable safety codes, standards, and regulations requiring compliance by contractor and subcontractor groups. Contractor shall be solely responsible for identifying and determining all safety codes, standards, and regulations that are applicable to the work.
- D. This Section addresses the Accident Prevention Program (APP) required in Chapter 296-800 WAC.
- E. This Section describes the requirements for submittal of the Contractor's Site Specific Health and Safety Plan (HASP). A HASP is a supplement to a Contractor's APP, however, it need not duplicate material in the APP. The HASP identifies all real and potential hazards during each phase of execution of the Work and provides a specific plan to deal with each hazard. Essentially, a HASP is a Job Hazard Analysis (JHA) of the entire project. A JHA is sometimes referred to as Job Safety Analysis (JSA) or Activity Hazard Analysis (AHA). The HASP shall clearly define responsibilities for Contractor and subcontractor employees per Chapter 296-155 WAC and WRD 27.00.

**1.02 QUALITY ASSURANCE**

- A. Referenced Standards: This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

<u>Reference</u>	<u>Title</u>
29 CFR 1910.146	Permit Required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (lockout/tagout)
29 CFR 1926	Safety and Health Regulations for Construction (OSHA)
Chapter 49.17 RCW	Washington Industrial Safety and Health Act (WISHA)
Chapter 296-24 WAC	DOSH / WISHA General Safety and Health Standards
Chapter 296-37 WAC	DOSH / WISHA Safety Standards for Commercial Diving
Chapter 296-843 WAC	DOSH / WISHA Hazardous Waste Operations (HAZWOPER)
Chapter 296-155 WAC	DOSH / WISHA Construction Safety
Chapter 296-800 WAC	DOSH / WISHA Safety and Health Core Rules
Chapter 296-803 WAC	DOSH / WISHA Lockout Tagout (Hazardous Energy Control)
Chapter 296-809 WAC	DOSH / WISHA Permit Required Confined Spaces
WRD 27.00	DOSH / WISHA Regional Directive
RCW 39.04.180	Trench Safety Systems, Safety Systems Required

- B. Qualifications:

- 1. Site Health and Safety Officer:



- a. Possess a minimum of five years progressive safety experience in the field of in-water safety and demonstrate work experience on projects similar in nature to the work to be done on this Contract.
  - b. Be knowledgeable concerning all Federal and State regulations applicable to safety.
  - c. Completed the OSHA 40-hour Safety and Health Course (OSHA 500).
  - d. Possess competent person certification in construction safety disciplines related to the work to be performed and be able to identify competent persons required by State and Federal safety standards for which they are not certified.
  - e. Training and current certification for CPR and First Aid.
  - f. Possess training and be capable of performing accident investigations and developing a concise report.
  - g. Possess training in the development and presentation of safety training meetings.
2. Shift Safety Officers:
- a. Possess a minimum of three years progressive safety experience in the field of in-water safety and demonstrate work experience on projects similar in nature to the work to be done on this Contract.
  - b. Be knowledgeable concerning all Federal and State regulations applicable to safety.
  - c. Completed the OSHA 10-hour Safety and Health Course.
  - d. Possess competent person certification in construction safety disciplines related to the work to be performed and be able to identify competent persons required by State and Federal safety standards for which they are not certified.
  - e. Trained in and possess current certification for CPR and First Aid.
3. Although not required, the following qualifications may be considered as contributing to the relevant experience required.
- a. Certified Safety Professional (CSP) certification from the American Society of Safety Engineers.
  - b. Degree from an institution of higher learning in Occupational Safety and Health.
  - c. ASSE Certified Safety Technician (CST).
  - d. Qualification as an instructor in CPR/First Aid or the OSHA 30 hour program.
- C. Work shall meet the requirements of:
- 1. 29 CFR 1926
  - 2. Chapter 49.17 RCW

### **1.03 SUBMITTALS**

- A. Procedures: Specification Section 01300.
- B. Qualifications.
- C. Company Accident Prevention Plan (APP):
  - 1. Update to reflect responses to Specification Section 00440 review comments in the bid evaluation.
  - 2. Submit within five days of the effective date of the NTP.
  - 3. Submit revisions during the execution of the work.
- D. Site Specific Health and Safety Plan (HASP):

1. Submit specific to the scope of work prior to starting the related work.
  2. Revised HASP that addresses changes in the Work.
- E. Accident/Incident Report(s): provide within 24 hours.
- F. Minutes and list of attendees of the pre-job safety meeting: provide within three days of the meeting.
- G. Minutes and list of attendees of weekly safety tailgate meeting: provide within three days of the meeting.
- H. Monthly Contractor Injury Summary Report: provide each month on Form 01063-A within ten days of the end of each month.
- I. Weekly summary of the daily site safety walk-through
- J. Notice and listing of flammable liquids and liquefied petroleum gases when they are planned to be used on the Site.

#### **1.04 SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP)**

- A. A comprehensive HASP covers all aspects of the Contractor's work activities related specifically and distinctly to the Work and site conditions. The HASP shall be based on a site specific hazard analysis and shall explain how the APP elements and site specific safety procedures shall be applied to the identified hazards in the work.
- B. At a minimum, provide the HASP detailing the safe work procedures and the safety preventive measures to be taken to provide an appropriate work environment for its employees, as well as County staff on site.
- C. The HASP shall be descriptive in nature, to provide the appropriate level of understanding for the potential hazards associated with the work to be performed at all stages and phases.
- D. The HASP shall provide an appropriate work environment for all persons on Site including Contractor and subcontractor employees, County staff, and authorized individuals.
- E. The HASP shall address all necessary personal protective equipment (PPE), atmospheric/air monitoring, safety equipment and tools, safety planning and coordination necessary to perform work safely.
- F. During the work, update as an addendum to the HASP, changes in conditions or scope of work before continuing work.
- G. Before beginning the work addressed in the HASP, meet the requirements of Specification Section 01300 that indicate a marking of a "1" or a "2".
- H. HASP organization:
1. Organized and bound to readily accept revisions and additions.
  2. Outline form.
  3. Table of contents.
  4. Numbered pages.
- I. Contractor and subcontractors are encouraged to use the consulting services of the State of Washington's Department of Labor and Industries (WISHA). The Seattle Field Office is located at:  
 315 5th Avenue South, Suite 200  
 Seattle, WA 98104-2607  
 (206) 515-2800  
<http://www.lni.wa.gov/wisha/>  
 Call or write for assistance with the requirements of this Section.

## 1.05 CONTRACTOR SAFETY QUALITY ASSURANCE

- A. Review the entire scope of work and applicable Contract requirements.
- B. Inspect the work site location and adjacent structures and systems to ensure that all safety considerations and requirements are addressed and planned prior to the start of work in the site specific HASP.
- C. Ensure that all Contractor and subcontractor employees comply with the APP and HASP.
- D. Designate a Site Health and Safety Officer on site with appropriate training, responsibility, and full authority to coordinate, implement, and enforce the Contractor's APP and HASP for the duration of the Work.
- E. In the APP and HASP, provide the name and telephone number of the Site Health and Safety Officer and the resume reflecting experience and training for the position. If there will be an alternate or additional staff with safety responsibilities, provide name and telephone number and qualifications in the APP and HASP.
- F. Ensure that safe work principles and practices are followed in completing work tasks.
- G. Document a daily site safety walk-through noting observations and corrective actions.
- H. If the Health and Safety Officer is to be changed during the Contract, submit Qualifications per this Section of the proposed officer prior to implementation on the Contract.
- I. Be responsible to correct hazardous conditions and practices. When more than one contractor is working within a given area, identify which personnel have the authority to take action to prevent physical harm and property damage.

## 1.06 HASP CONTENT

- A. The following describes certain minimum precautions for consideration in developing a HASP. Include in the HASP all of the items which may apply to the work. There may be other items not indicated below which shall be addressed in the HASP. The items indicated below do not cover every possible situation or hazard. Items that are not needed shall be noted in the HASP as not applicable (N/A).
- B. Hazardous Waste Operations (Chapter 296-843 WAC)
  1. Specific Safety Plan Requirements apply to Hazardous Waste Clean-up Operations and Projects designated as Superfund sites on the Environmental Protection Agency's (EPA) National Priority List (NPL) and State Priority Lists for sites covered under the Model Toxics Control Act (MTCA).
  2. Provide a written program detailing how Contractor, Consultant and County staff on the site will be protected from the dangers of work associated with Hazardous Waste Site Operations. At a minimum, the program shall include at least the following;
    - a. Hazard analysis:
      - i. Identification and evaluation of on-site safety and health hazards.
      - ii. A safety and health risk (hazard) analysis for each site task and operation that is identified in the comprehensive work plan.
    - b. Organization chart:
      - i. An organizational structure that reflects current site operations, including the following:
        - Establish and identify the chain of command.
        - Identify the site safety and health supervisor and other personnel responsible for employee safety and health.
        - Specify the overall responsibilities of supervisors and employees.

- Include the name and title of the person with responsibility and authority to direct all hazardous waste operations.
- Include a site safety and health supervisor responsible for developing and implementing the HASP and verifying compliance.
- Identify the functions and responsibilities of all personnel needed for hazardous waste operations and emergency response.
- Identify site specific lines of authority, responsibility, and communication.

c. Comprehensive work plan:

i. A written comprehensive work plan of tasks, objectives, logistics, and resources for site operations, including the following:

- Addresses anticipated clean-up activities and normal operating procedures unless that information is already available in another document.
- Defines work tasks and objectives.
- Describes how the work tasks and objectives will be accomplished.
- Establishes the personnel requirements to implement the work plan.
- Provides for implementation of training, briefings, and information as required by WAC 296-843-200.

d. Site control plan:

i. An up-to-date site control plan before clean-up operations begin to minimize employee exposure to hazardous substances and including the following (unless it is available in another document):

- A site map.
- Establish site work zones.
- How the “buddy system” is used.
- The site communications plan, including how employees are alerted during emergencies.
- The site's standard operating procedures (SOPs) or safe work practices.
- Identification of the nearest medical assistance.

e. Personal protective equipment:

i. A PPE plan that addresses all of the following:

- Site hazards and activities.
- Methods to evaluate the effectiveness of the PPE plan.
- Criteria for selecting and fitting PPE, including work duration, use limitations of particular PPE, and medical considerations such as temperature extremes and heat stress.
- Training on PPE use.
- Procedures for putting on and taking off PPE.
- PPE inspection procedures prior to, during, and after use.
- Decontamination and disposal of PPE.
- Maintenance and storage of PPE.

f. Additional elements:

- i. A sampling and monitoring plan (see WAC 296-843-130)
- ii. Site control measures (see WAC 296-843-140).
- iii. Decontamination procedures (see WAC 296-843-150).

- iv. Spill containment plans (see WAC 296-843-180, Drum and container handling).
- v. Standard operating procedures for sampling, managing, and handling drums and containers (see WAC 296-843-180).
- vi. Entry procedures for tanks or vaults (see chapter 296-809 WAC, Confined spaces. Chapter 296-843 WAC Hazardous Waste Operations Safety and Health Core Rules
- vii. A training, certification, briefings, and information plan (see WAC 296-843-200).
- viii. A medical surveillance plan (see WAC 296-843-210), that includes site-specific medical surveillance requirements.
- ix. Sanitation (see WAC 296-155-140).
- x. Lighting (see WAC 296-800-210).
- xi. Excavations (see chapter 296-155 WAC, Part N, Excavation, trenching and shoring).
- xii. Any relationship or interaction between other programs and the site-specific program.

*Note: The emergency response plan required by WAC 296-843-160, Emergency response for hazardous waste sites, is also included as a separate section in the HASP.*

C. Hazard Communication (Chapter 296-800 WAC):

- 1. Contaminant gases that may be encountered.
- 2. Provide a written Hazard Communication Program and emergency management plan addressing these and other potential hazardous substances that may exist and be brought on site during the work.
- 3. For work requiring use of hazardous materials and chemicals, provide a list and corresponding Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) for hazardous chemicals to be used on site. If no hazardous chemicals are to be used, provide statement to that effect.

D. Confined Space (Chapter 296-809 WAC):

- 1. All confined spaces are designated and classified as Permit Required Confined Spaces.
- 2. The nature of the work may expose workers to permit required confined spaces having possible explosive, toxic, and oxygen deficient atmospheric conditions.
- 3. Provide a written Permit Required Confined Space Safety Program that meets the requirements of 29 CFR 1910.146 and Chapter 296-809 WAC.

E. Lockout Tagout (Hazardous Energy Control) (Chapter 296-803 WAC):

- 1. The nature of the work may expose workers to hazardous energy sources that include, but are not limited to, electrical, mechanical, pneumatic, hydraulic, thermal, and computerized systems.

2. Provide a written plan outlining safe work practices addressing hazardous energy control procedures that meet the requirements of 29 CFR 1910.147 and Chapter 296-803 WAC.
- F. Fall Prevention and Protection (Chapter 296-24 WAC Part J-1 and Chapter 296-155 WAC Part C-1):
1. The nature of the work may expose workers to fall hazards.
  2. Provide a written Fall Prevention and Protection plan outlining safe work practices addressing fall hazards that meet the requirements of Chapter 296-24 WAC Part J-1 and Chapter 296-155 WAC Part C-1.
- G. Personal Protective Equipment (PPE) (Chapter 296-800 WAC):
1. The nature of the work may expose workers to miscellaneous injury hazards that include, but are not limited to: head, hands, feet, body, eyes, and ears.
  2. Provide a written PPE plan outlining safe work practices addressing the use of PPE and clothing that meet the requirements of Chapter 296-800 WAC.
- H. Commercial Diving Operations (Chapter 296-37 WAC):
1. Due to the hazards associated with commercial diving operations, specific safety protocols and procedures are required to ensure worker and diver safety.
  2. Provide a comprehensive Safe Practices Manual for Diving Operations that complies with Chapter 296-37 WAC.
- I. Heavy Equipment Operations, Staging:
1. All vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems shall be maintained in operable condition and may use common components.
  2. Before leaving a motor vehicle unattended the motor shall be stopped. The parking brake shall be engaged and the wheels turned into curb or berm when parked on an incline. If parking on an incline and there is no curb or berm, the wheels shall be chocked or otherwise secured.
- J. Suspect Material:
1. Unless otherwise indicated, promptly suspend work and notify the Project Representative of unusual conditions, including oily soil found on the Site. Work shall remain suspended until the Project Representative authorizes, in writing that the work may resume.
- K. Traffic Control Plan:
1. The needs and control of all road users (motorists, bicyclists, and pedestrians) within the highway, or on private roads open to public travel, including persons with disabilities, through a temporary Traffic Control zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.
  2. When the work requires the occupation of traffic lanes, parking lanes, parkways, or other public right-of way closures, it shall be per the Local Authority Having Jurisdiction See Specification Section 01570 for requirements.
- L. Electrical Safety:

1. Use either ground-fault circuit interrupters or assured equipment grounding conductor program to protect employees on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. These requirements are in addition to any other requirements for equipment grounding conductors per WAC 296-155-447.
2. In work areas where the exact location of underground electric power lines is unknown, no activity that may bring employees into contact with those power lines shall begin until the power lines have been positively and unmistakably de-energized and grounded.
3. Where overhead electric conductors are encountered in proximity to a work area be responsible for ascertaining the voltage and minimum clearance distance required and maintaining the minimum clearance distance per WAC 296-155-428.
4. Do not permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.
5. Work on energized equipment:
  - a. Only qualified persons shall work on electric circuit parts of equipment that have not been de-energized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, PPE, insulating and shielding materials, and insulated tools.
  - b. Use of an Energized Electrical Work Permit shall be required to ensure all shock and arc flash hazard have been considered.

## **1.07 UTILITIES**

- A. Call the Utilities Underground Location Center (UULC) before you dig, phone number 811.
- B. During the performance of the work, take appropriate precautions when working near, around, and with utilities, in order to protect the health and safety of the worker, the public, property, and the environment.
- C. Provide a flagged warning line for all work conducted in proximity to power lines. Coordinate and meet the requirements of the utility owner for this work.
- D. Coordinate and meet the requirements of the utility owner and the Project Representative to obtain approval to disconnect or reconnect utilities.

## **PART 2 PRODUCTS**

### **NOT USED**

## **PART 3 EXECUTION**

### **3.01 SAFETY AND HEALTH COMPLIANCE**

- A. Implement the written APP as required by Chapter 296-800 WAC, submitted in the bid evaluation per Specification Section 00440 and accepted at the conclusion of the bid evaluation.
- B. The Project Representative reserves the right to audit the Contractor's APP and implementation of the HASP.
- C. Ongoing work and hazardous situations that are considered a health and safety risk by the Project Representative shall be corrected immediately.

- D. Be responsible to stop that portion of the work that is determined to be an imminent or immediate threat to worker health and safety.
- E. Ensure that necessary air monitoring, ventilation equipment; protective clothing, hazardous energy control devices, fall prevention, and other specified supplies and equipment are made readily available to employees to facilitate implementation of the APP and the HASP.
- F. Incidents:
  - 1. Notify the Project Representative immediately of all near miss incidents and all incident accidents involving personal injury and property damage.
  - 2. Provide a written report known as the Incident Report within 24 hours of any incident. Report for each incident occurrence shall include:
    - a. Description of the event.
    - b. Names of personnel involved.
    - c. Description of injuries and treatment required (short term and long term).
    - d. Description of property damage.
    - e. Site visits and inspections of other agencies as a result of an incident. Include names of the persons, purpose of the visit, and any other pertinent information.
- G. Conduct a pre-job safety meeting with Contractor staff and with all subcontractor staff. Submit list of attendees and minutes of pre-job safety meeting.
- H. Conduct all weekly safety tailgate meetings. Submit list of attendees and minutes of weekly safety tailgate meetings.
- I. Submit a Monthly Contractor Injury Report on Form 01063-A in Specification Section 01999 consisting of a summary of the current month's injury accidents.
- J. Use of intoxicants or of illegal or debilitating drugs while working on a County contract is prohibited.
- K. Failure to comply with safety and health regulations may result in work suspension until adequate safety and health measures are implemented.
- L. Use the Safety Officer that meets the requirements for implementation per Specification Section 01300. No Safety Officer shall be assigned that does not meet the requirements of Specification Section 01300 and this Section.
- M. Submit all safety related citations received for Contract work immediately upon receipt. If appealed to the state of Washington, notify the Project Representative a minimum of every month updating the status of the appeal until resolved. Submit documentation of the findings when resolved.

### **3.02 SITE SPECIFIC HEALTH AND SAFETY PLAN REVISIONS**

- A. In the event that the Project Representative, regulatory agencies, or jurisdictions determine the HASP, associated documents, or organizational structure to be inadequate to protect employees and the public:
  - 1. Modify the APP and HASP to meet the requirements of said regulatory agencies, jurisdictions, and the Project Representative.
  - 2. Provide submittal for revisions to the APP and HASP within seven days of the notice of a required modification.



3. The revision shall meet the requirements of Specification Section 01300 prior to changing work practices.

### **3.03 POSTING**

- A. Provide and maintain a copy of the most up to date APP and the HASP at the Contractor's site office and at each of the subcontractors' offices.

### **3.04 COMPLIANCE**

- A. Failure to comply with this Section will result in work suspension until adequate safety and health measures are implemented.

### **3.05 TECHNICAL ASSISTANCE**

- A. Technical assistance is available from:  
Wastewater Treatment Division  
Safety and Hazardous Materials Program Office  
201 South Jackson St.  
Mail Stop: KSC-NR-0515  
Seattle WA 98104
- B. Contacts:
  1. Jim Faccone – WTD Safety and Hazardous Materials Program Manager  
Phone (206) 477-5379
  2. Terry Fiber – WTD Construction Safety Coordinator  
Phone (206) 477-5383

**END OF SECTION**

**Specification Section 01063**

**Attachment A**

**Form 01063-A – Monthly Contractor Injury Summary Report**

**01063-A MONTHLY CONTRACTOR INJURY SUMMARY REPORT**

Contract Name: \_\_\_\_\_  
 Contract No: \_\_\_\_\_ Month: \_\_\_\_\_  
 Contractor: \_\_\_\_\_

**OSHA RECORDABLE CASES**

WORK GROUP	NUMBER OF CASES	
	Reporting Month	Year-to-Date
Hourly Employees		
Supervisory Personnel		
TOTAL		

**LOST TIME ACCIDENTS**

WORK GROUP	NUMBER OF CASES		LOST WORKDAYS	
	Reporting Month	Year-to-Date	Reporting Month	Year-to-Date
Hourly Employees				
Supervisory Personnel				
TOTAL				

**TOTAL HOURS WORKED AT CONTRACT SITE**

Reporting Month	
Year-to-Date	

**INCIDENT AND SEVERITY RATE**

Date of last lost-time accident: \_\_\_\_\_  
 Number of hours worked since last lost-time accident: \_\_\_\_\_

Incident Rate =  $\frac{\text{Total Number of OSHA Recordable Cases} \times 200,000}{\text{Total Hours Worked at King County Project Site}}$

Severity Rate =  $\frac{\text{Total Number of Lost Workdays} \times 200,000}{\text{Total Hours Worked at King County Project Site}}$

RATES	Reporting Month	Year-to-Date
Incident Rate		
Severity Rate		

Monthly Incident Summary

DATE	NAME	TRADE	COMPANY	INCIDENT	Contributors and Preventive Measures

**SECTION 01200**  
**CONTRACT MEETINGS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies Contract meetings prior to and during construction.

**1.02 PHASE 1 PRECONSTRUCTION MEETING**

- A. The King County Project Representative or their designee will chair a meeting of representatives of the Contractor, County staff and Consultants, and other affected agencies prior to beginning construction. The purpose of the meeting will be to:
1. Establish lines of authority and communication within the Contract team.
  2. To discuss the administrative requirements of the Contract.
  3. Address project issues if needed.
  4. To define the duties and responsibilities of all parties.
  5. To review Contractor required submittals
- B. Agenda
1. Preparation of Contractors Work Plan and other submittals
  2. Project Schedule
- C. Attendance at Phase 1 Preconstruction Meeting
1. Attendance is required from:
    - a. Project Representative and other County staff or consultants.
    - b. Field Engineer (FE).
    - c. Contractor's Project Manager and Site Superintendent.
    - d. Subcontractors, as pertinent to agenda.
    - f. Representatives of governmental agencies, other regulatory agencies, or utilities as determined by KC.

**1.03 PHASE 2 PRECONSTRUCTION MEETING**

- A. The King County Project Representative or their designee will chair a meeting of representatives of the Contractor, County staff and Consultants, and other affected agencies prior to beginning construction. The purpose of the meeting will be to:
1. Establish lines of authority and communication within the Contract team.
  2. To discuss the administrative requirements of the Contract.
  3. Address project issues if needed.
  4. To define the duties and responsibilities of all parties.
  5. Review methods for documenting and reporting inspection data and compliance with construction documents, including methods for processing design changes and securing EPA review and approval of such changes as necessary;
  6. Review methods for distributing and storing documents and reports;
  7. Review work area security and safety protocols; and
  8. Demonstrate that construction management is in place, and discuss any appropriate modifications of the CQAPP to address site-specific considerations.
- B. Agenda:
1. Schedule.
  2. Health and safety.
  3. Mobilization plan.
  4. Equal employment regulations.
  5. Apprenticeship programs.
  6. Administrative procedures of the Contract.

7. Permits, easements, community relations.
  8. Other issues agreed between Contractor and County.
  9. Site Access.
- C. Ensure that the Contractor's Project Manager, superintendent, Safety Officer, and representatives of all major subcontractors are present at the meeting.

#### 1.04 PROGRESS MEETINGS

##### A. General

1. Attend Daily Briefings to review project operations of previous day, ongoing operations being performed that day and review operations planned for next 3 days.
2. Attend weekly progress meetings to discuss the issues and progress of the project. Meetings may be more or less frequent depending on the progress and status of the work.
3. Arrange for attendance of subcontractors as necessary at Daily Briefings and Progress Meetings to discuss job progress.
4. Meeting times to be mutually agreed to between the King County Project Representative and Contractor Project Manager and Site Superintendent.

##### B. Attendance at Daily Briefings and Project Meetings

1. Attendance is required from:
  - a. Project Representative and other County staff or consultants.
  - b. Field Engineer (FE).
  - c. Contractor's Project Manager and Site Superintendent.
  - d. Subcontractors, as pertinent to agenda.
  - e. Contractor Safety Officer.
  - f. Representatives of governmental agencies, other regulatory agencies, or utilities as determined by KC.

##### C. Agenda for Daily Briefings

In general the agenda for each meeting is to be agreed by Contractor and Project Representative and may include items such as:

- a. Work performed previous day
  - a. Any issues encountered
  - b. Results
  - c. Review of water quality monitoring data
- b. Work being performed today
  - a. Ongoing status
  - b. Any issues Encountered
  - c. H&S
- c. Work Planned for next three days
  - a. Schedule
  - b. Potential issues/constraints
  - c. Schedule for diver inspections
  - d. Schedule for hydrographic surveys

##### D. Agenda for Progress Meetings

1. In general the agenda for each meeting is to be agreed by Contractor and Project Representative and may include items such as:
  - a. Review progress on action items from prior meetings.
  - b. Review work progress since last meeting compared to the look ahead schedule.
  - c. Look ahead schedule for upcoming period.
  - d. Identification of problems that might impede planned progress.
  - e. Construction deficiencies.
  - f. Contract administrative including:
    - 1) RFI status
    - 2) Submittal status
    - 3) RCO status
    - 4) RCP status
    - 5) as-built status

- g. Coordination of projected work with other contractors.
- h. Project Safety.
- i. Other items as required by the Project Representative or the Contractor.

### **1.05 OTHER MEETINGS**

A. Contractor shall participate in additional meetings as requested by the Project Representative. Contractor attendance at additional meetings shall be as requested by Project Representative

## **PART 2 PRODUCTS**

### **2.01 MEETING RECORD**

- A. The FE will record:
  - 1. List of issues discussed
  - 2. Agreements
  - 3. Follow-up action items required by either the Contractor or the County
  - 4. Construction deficiencies noted
  - 5. Contract administrative deficiencies noted
  - 6. Project safety issues

## **PART 3 EXECUTION**

**Not Used.**

**END OF SECTION**

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**SECTION 01300**  
**SUBMITTALS PROCEDURE**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies procedures and requirements for all submittals, substitutions, deviations, and the master submittal list required by the Specifications.
- B. In addition to submittals required by individual Specification Sections, submit information on Contractor chosen items to be included in the Work, including items shown on the drawings but not specified.
- C. Submit information on all repair and corrective work required of or generated by the Contractor such that the acceptability of the quality of the repair or correction can be assessed before it is performed.
- D. Submit descriptive information that will enable the King County Project Representative (Project Representative) to assess whether the proposed materials, equipment, or methods of work are in required conformance with the work and in compliance with the Contract.
- E. Specifically identify and annotate any deviation or substitutions in the submittal. Contractor shall not make any substitutions without written approval from the Project Representative prior to making such substitution.
- F. No fabrication or construction work shall occur on a specific submittal item without a submittal Review Action of "1" NO EXCEPTIONS TAKEN or "2" NOTE MARKINGS.
- G. Unless specified otherwise in this Contract, preparation and revisions of submittals is to be an incidental expense and not a pay item.

**1.02 MASTER SUBMITTAL LIST**

- A. Prepare and submit within 10 days after the effective date of the Notice to Proceed (NTP), a Master Submittal List listing all items for which submittals are required by the Specifications. Organize the Master Submittal List by Specification Section number and include the following information for all listed items:
  - 1. Item identification.
  - 2. Specification Section number.
  - 3. Planned submittal date.
  - 4. Identification of those items that are substitutions or contain deviations from the Specifications. No substitutions may be made without written approval by the Project Representative.
  - 5. Identification of those items that require other jurisdictional agency review and approval.
  - 6. The List shall include columns for future use as information becomes available for the following items:
    - a. Trade name, model, and catalog designation.
    - b. The scheduled need dates for control purposes.
    - c. Date submitted.



- d. The date approval is needed.
- e. The date on which material is needed.

### **1.03 CONTRACTOR RESPONSIBILITIES**

- A. Be responsible for the accuracy and completeness of the information contained in each submittal.
- B. Verify that the material and equipment described in each submittal conforms to the requirements of the Contract prior to submittal.
- C. Ensure that the material, equipment and methods of work used are described in the submittal.
- D. Coordinate and integrate all submittal dates with the Baseline Schedule.
- E. Annotate on the Submittal Transmittal Form 1300-A if the submittal conflicts or may affect the work with other submittals.
- F. Ensure coordination of submittals among the suppliers, related crafts, subcontractors, and with the planned work. The Contractor will be held responsible for any cost or schedule impact caused by a submittal coordination failure.
- G. Submit a request for all substitutions using Form 01300-B received from the Project Representative.
- H. Call out all deviations from the Contract on the Submittal Form 01300-A transmitted to Project Representative and note where applicable in the body of the submittal.

### **1.04 SUBMITTALS ON ITEMS DIFFERING FROM THAT REQUIRED BY THE CONTRACT DOCUMENTS**

#### **A. APPROVED EQUAL**

- 1. Definition: An item of material or equipment proposed by the Contractor that has the same function, quality, durability, appearance, strength, and design characteristics equal to that named, that meets the requirements of the Specification, and is sufficiently similar so that no change in related work is required. The item of material or equipment shall reliably perform at least equally well for the function imposed by the design concept of the completed work as a functioning whole. In general, approved equal applies to manufactured items.
- 2. Clearly note on the submittal Form 1300-A if any items are submitted as an equal.
- 3. Acceptance is at the Project Representative's sole discretion and the decision regarding acceptance or rejection shall be final. If the Contractor disagrees, a Request for a Change Order shall be filed in accordance with contract provisions. Do not assume acceptance at any time prior to the rendering of decision by the Project Representative.

#### **B. SUBSTITUTION**

- 1. Definition: An item of difference in materials, equipment, means, method, technique, dimension, sequence, or procedure which functionally meets the Contract requirements, but does not meet the Specification(s) and is equal to or better than the specified item.
- 2. A submittal shall be provided for each substitution request, must be submitted using Form 01300 – B, and shall address all items on the form. The request shall include complete specifications or means and methods for the item including procurement, operational and maintenance cost data. Substitution Request forms shall be numbered sequentially beginning with the number No. 1.

3. Any Substitution not identified on a submittal is not accepted or approved regardless of any action taken on the submittal by the County. Action taken by the County on the submittal shall not relieve the Contractor from complying with the original Contract requirements.
4. Acceptance is at the Project Representative's sole discretion and the decision regarding acceptance or rejection of the substitution shall be final. If the substitution is rejected, proceed with the contract specifications without delay. Do not assume acceptance at any time prior to the rendering of a written decision by the Project Representative.

#### C. DEVIATIONS

1. Definition: A minor change or omission to a specified material, procedure or product proposed by the Contractor that does not fully conform to the requirements specified, but conforms to dimensional, operational, and maintenance requirements and can be shown to accomplish the functional and operational and maintenance performance of the specified item.
2. Annotate in the submittal all deviations from stated requirements in the Contract. Any deviation not identified on the submittal is not accepted or approved regardless of any subsequent action on the submittal by the County. Failure of the County to comment on the deviation shall not relieve the Contractor from complying with the original Contract requirements.
3. Acceptance is at the Project Representative's sole discretion and the decision regarding acceptance or rejection shall be final. Do not assume acceptance at any time prior to the rendering of a decision by the Project Representative.

### **PART 2 PRODUCTS**

#### **NOT USED.**

### **PART 3 EXECUTION**

#### **3.01 TRANSMITTAL PROCEDURE**

##### A. General:

1. Submittals shall be accompanied by Submittal/Transmittal Form 01300-A. An electronic blank copy of this form will be provided by the Project Representative. Equipment numbers shall be listed on Form 01300-A for items being submitted. A separate form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections for which a submittal is required. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package, or are so functionally related that expediency indicates checking or review the group or package as a whole. No multiple-Section submittals will be allowed except where previously approved by the Project Representative.
2. A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "XXX"; where "XXX" is the sequential number assigned by the Contractor. Resubmittals shall have the following format: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for re submittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of Submittal 25.
3. Submit all proposed approved equals as a part of the submittal process.

4. Transmit one electronic pdf document of each submittal or resubmittal to the Project Representative. The electronic document must be accompanied with a completed Submittal/Transmittal Form 01300-A, and include all submittal materials. The electronic documents may be attached to an e-mail, the Project Representative will provide the e-mail address. Digital files in excess of 5 MB will not be transmitted via e-mail and may be sent using a King County FTP site. The Project Representative will provide instructions for use of the King County FTP site.
  5. Transmit one reproducible exact replica of the electronic documents via hand delivery or mail to King County within seven days from transmittal of the electronic submittal document. The reproducible documents shall not exceed 22 inches x 34 inches. Product samples and color samples may not be transmitted electronically.
- B. Samples: Submit the number requested in the Specification Section with the submittal form.
- C. Certificates: Will be considered as information. No copy shall be returned.
- D. "Submit for information only": No copy shall be returned.

### **3.02 REVIEW PROCEDURE**

- A. Unless otherwise specified in the Technical Specifications, within 30 days after receipt of each submittal or resubmittal, one electronic copy of the County's identified Review Action and any review comments will be transmitted to the Contractor. This will be followed with one paper replica of the electronic document within seven days from the transmittal of the electronic document.

The returned submittal will indicate one of the following actions:

1. If the review indicates that the submittal is in general conformance with the Contract, the submittal copies shall be marked "No Exceptions Taken" and given a Review Action of "1." In this case, implement the work covered in the submittal.
2. If the review indicates that the submittal requires limited corrections, the submittal copies will be marked "Note Markings" and given a Review Action of "2." In this case, begin to implement the work covered in the submittal in accordance with the markings noted. Where submittal information is to be incorporated in O&M data, a corrected copy shall be resubmitted; otherwise, no further action is required.
3. If the review reveals the submittal is insufficient and contains incorrect data and the comments are of a nature that can be confirmed, the submittal copies shall be marked "Comments Attached --Confirm" and given a Review Action of "3." A Review Action "3" does not allow implementation of the work covered by the submittal until the information requested to be confirmed in the submittal has been revised, submitted, and returned to the Contractor with a Review Action of either "1" or "2."
4. If the review reveals the submittal is insufficient or contains incorrect data and the comments require that the submittal be revised and resubmitted, the submittal copies shall be marked "Comments Attached --Resubmit" and given a Review Action of "4." A Review Action "4" does not allow implementation of the work covered by the submittal until the information in the submittal has been revised, resubmitted, and returned to the Contractor with a Review Action of either "1" or "2."
5. If the review reveals that the submittal is not in general conformance with the Contract, or if the submittal is incomplete, the submittal copies shall be marked "Rejected" and given a Review Action of "5." Submittals containing deviations or substitutions from Contract which have not been clearly identified by the Contractor fall into this category. A Review Action

"5" does not allow implementation of the work covered by the submittal until the information in the submittal has been revised, resubmitted, and returned with a Review Action of either "1" or "2."

- B. Contractor's Work Plan and Contractor Quality Control Plan will be reviewed by both the County and the U.S. Environmental Protection Agency.
  - 1. County review: The contractor shall complete submittals (per Section 02221 1.03 A and B) in accordance with the following procedure.
    - a. Submit the draft submittal within 30 days of Phase 1 Notice to Proceed for County initial review.
    - b. Address comments and submit revised draft within 15 days of receipt of comments.
  - 2. EPA review: The U.S. EPA will review and comment on the Contractor Work Plan and Contractor Quality Control Plan (per Section 02221 1.03 A and B)
    - a. King County will transmit the submittals to U.S. EPA for review and comment (anticipated to be 30 days).
    - b. Address comments on revised draft and submit final draft within 15 days.
  - 3. Work covered by the submittal may progress when the submittal is returned with a Review Action of 1 or 2.

### **3.03 EFFECT OF REVIEW OF SUBMITTALS**

- A. Review of submittals shall not relieve the Contractor of its responsibility for errors or omission therein and shall not be regarded as an assumption of risks or liability by King County.
- B. Unless Contractor specifically identifies and King County accepts a Deviation or Substitution on the submittal, no disposition of the submittal by King County changes the requirements of the Specification and Drawings.

**END OF SECTION**

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**Specification Section 01300**

**Attachment A**

**Submittal Transmittal Form 1300-A**



**Specification Section 01300**

**Attachment B**

**Substitution Request Form 1300-B**



TO: \_\_\_\_\_

CONTRACT NO. C\_\_\_\_\_C: CONTRACT NAME: \_\_\_\_\_

We hereby submit for your consideration the following item instead of the specified item or procedure:

<u>Section</u>	<u>Paragraph</u>	<u>Specified Item</u>
_____	_____	_____

Proposed Substitution:

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Attach complete data, including laboratory tests, if applicable. Include complete information on changes to Contract Drawings and/or Specifications which proposed substitution would require for its proper installation.

Fill in blanks below:

A. How will substitution affect dimensions shown on Drawings?

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B. What effect does the substitution have on the Baseline or Update Schedule?

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C. State quality and performance differences between proposed substitution and specified item or procedure.

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D. List the cost differences between proposed substitution and specified item or procedure. (Attach estimate/quote and indicate net change).

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**SECTION 01311**  
**PROGRESS SCHEDULES AND REPORTS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies requirements and procedures for preparing construction schedules, schedule of values, and reports.
- B. The purpose of the construction schedules, schedule of values and reports are to ensure adequate planning and execution of the work by the Contractor, to establish the standard against which satisfactory completion of the work shall be judged, to assist in monitoring progress, to determine progress payments and to assess the impact of Change Orders on the construction schedule.

**1.02 SUBMITTALS**

- A. Procedures: Specification Section 01300.
- B. Draft construction schedule: Submit for review at the Phase 1 pre-construction conference.
- C. Construction Baseline Schedule: Submit within 15 days of receiving review comments on the Draft Construction Schedule.
- D. Weekly progress reports: Submit weekly progress and one week look ahead reports for discussion at weekly progress meetings.
- E. Monthly report: Submit with Application for Payment.

**1.03 CONSTRUCTION SCHEDULES**

- A. Draft construction schedule: Include material and equipment procurement and construction work. Clearly indicate major milestones and the time(s) for completion which are required to be met under the terms of the Contract. Include the bar chart and a draft schedule of values.
- B. Construction schedule: Include the bar chart, schedule of values, and cash flow projection. The schedule submitted shall be considered the Baseline Schedule.
- C. Time scaled bar chart based on the construction schedule prepared on 11-inch x 17-inch sheets. Band by activities, indicated in the schedule of values, or as approved by King County's Project Representative (Project Representative).
- D. Activities: Show on construction bar charts at their early start/finish period.
- E. Include Submittal and procurement activities including preparation and submittal of shop drawings, product data, samples, fabrication, delivery, as-built drawings, O&M manuals.
- F. Dates indicated on the schedule by the Contractor shall not be binding on the Project Representative.
- G. Failure of the Contractor to include an element of work required for the performance of this Contract shall not excuse the Contractor from completing the work as described in the Contract.
- H. Provide a list of the holidays and non-work days applicable to the schedule.

**1.04 SCHEDULE OF VALUES**

- A. Submit a balanced schedule of values for the Lump Sum Bid items. At a minimum, break up the Lump Sum bid item work into units for payment as described below. The total value of the activities shall equal the Contract Lump Sum bid amount. Overhead and profit shall be prorated to the activities. Activity values shall be rounded to the nearest dollar.

1. Schedule of Values
  - a. Phase 1
    - i. Submittals
  - b. Phase 2
    - i. Mobilization
    - ii. As-builts and Project documentation
    - iii. Demobilization
      - Punch List
    - iv. Completion of As-builts and Demobilization: 5%
- B. The value to be allocated to the mobilization activity shall not exceed 18% percent of the original Contract Price.
- C. If, in the opinion of the Project Representative, the schedule of values is unbalanced, present documentation substantiating the cost allocations of those activities believed to be unbalanced.
- D. Include all values as required by other sections in the Specifications.

#### **1.05 WEEKLY PROGRESS REPORT**

- A. Contractor shall submit weekly progress report to the Project Representative.
- B. Summarize actual ENR and ENR+AC production per week over the course of the project to date and projected material production per week through the completion of the Project.
- C. Summarize the number of barges and tons of ENR material delivered per week over the course of the project to date and the projected barges/tons for the next 2 weeks.
- D. Summarize work planned for the upcoming week
- E. Identify anticipated delays in completing the work on schedule, and recommend modifications to the work plan to mitigate delays.

#### **1.06 MONTHLY REPORT**

- A. Include an updated construction bar chart, schedule of values, cash flow projection and narrative summary.
- B. The narrative summary briefly describes the progress of the project. The report will describe how the project is progressing towards its completion. It shall identify milestones completed, major equipment deliveries and problems arising during the month. The report should project the work anticipated during the coming month, including major deliveries and submittals.

#### **1.07 CASH FLOW REPORT**

- A. Include a forecast, by month, based on the current schedule, of cash requirements to complete the Contract.

### **PART 2 PRODUCTS**

#### **2.01 NOT USED.**

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Provide a construction schedule and narrative summary so the Project Representative may use them as a basis for determining the Contractor's compliance with the Contract regarding progress payments, Contract Time extensions, change order prices and impacts, and the

overall progress of the work. Failure to comply with the requirements of this Section will be a cause for delay in the review and acceptance of the progress payment requests.

### **3.02 UPDATES**

- A. If actual progress is observed to deviate from the construction schedule by 1 week behind or 1 week ahead, update and submit a revised construction schedule. In the case of the work being behind schedule, submit, along with the revised construction schedule, a written plan for completing the work within the milestone and Contract Time and before closure of in water work period.
- B. Requests for extensions in time resulting from changes issued by the County shall be accompanied by a narrative report explaining the impacts and costs associated with the extension.
- C. On approval of a change order by King County, the approved change shall be reflected in both time and value in the next submission of progress reports and schedule updates. Contract Time extensions and schedule revisions shall be incorporated into the monthly updated construction schedule and schedule of values.

**END OF SECTION**

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**SECTION 01500**  
**CONTRACTOR'S CONSTRUCTION FACILITIES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. General
1. This project primarily includes on water work using a floating plant (instrumented excavator with clamshell or equivalent) to place ENR materials at three different Plots within the Duwamish Waterway. The three Plots are located in geographically different areas of the Lower Duwamish Waterway with no common upland area. King County does NOT have property available for Contractors use for office, lay down, parking, docking or any other use. Contractor is solely responsible for making all arrangements for suitable upland access, parking, offices, laydown area and vessel moorage and dock for safe and efficient transfer of personnel, equipment and supplies as needed. This shall include safe access from provided secure upland parking area to dock, vessel and operator for prompt, safe and efficient transport of King County Project Staff and Representatives including Construction Quality Assurance (CQA) staff and agency inspectors, LDWG members and personnel from dock to work areas and equipment as necessary throughout the project.
- B. This Section specifies the following Contractor temporary construction facilities and construction requirements for:
1. Utilities: power, heating, ventilation, telephone, water, and sanitary facilities.
  2. Work site access control: concrete barriers, fencing, and security.
  3. Miscellaneous items: parking, staging, cleaning, project signage, and Contractor office.
  4. Roads: haul roads, haul routes, and access roads. (for any materials delivered by truck)
  5. Contractor Site Office
  6. Contractor Provided Offices for King County Project Representative (Project Representative)/Project Engineer, both on floating plant and onshore.
  7. Parking
  8. Other as required by the Contractor
  9. Dock for safe personnel and equipment transfer from upland parking area to Contractor provided vessel (with operator) for transport to/from floating plant as requested. Contractor shall have suitable vessel capable of carrying up to ten people from dock to work areas and floating plant.
- C. Unless otherwise noted, be responsible for all costs for utility usage and permitting associated with the requirements of this Section.
- D. Unless otherwise noted, the County will not furnish any materials, facilities, utilities or services.

**1.02 SANITARY FACILITIES**

- A. Provide clean and sanitary toilet and wash-up facilities for the work force at the site (Both on floating plant and at Site office onshore). Comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps.

**1.03 CONTRACTOR'S SECURITY**



- A. Provide security and facilities to protect all temporary and existing facilities from unauthorized entry, vandalism, or theft.

#### **1.04 HAUL ROADS AND LOCATIONS**

- A. Submit all haul locations for all types and classification of material to be imported to the worksite. If haul locations are to be added or location of material haul location is changed, submit new haul location and types and classification of material.
- B. Submit in weekly report the type and amount of material imported to the site.
- C. Repair any damage to roadway surfaces from the direct or indirect result of the Contractor's operation to the requirements of the responsible agency.
- D. Obtain all necessary street use permits in connection with Contractor's operations.
  - 1. When hauling is done over highways or city streets, the loads shall be trimmed and the vehicle shelf areas shall be cleaned after each loading. The loads shall be watered after trimming to minimize dust.
  - 2. Maintain traffic patterns in the existing structural filled areas which preserve the stability of the soil under all future structural foundations or paved areas.

#### **1.05 RESTORATION OF ROADS**

- A. Clean and repair roads used by the Contractor as required during and completion of the work.
- B. Unless otherwise noted, resurface paved roadways, and bring to original grade and section roads which are not paved, where the surface is removed, broken, damaged, caved, or settled during the work.

#### **1.06 MAINTENANCE OF TRAFFIC**

- A. Conduct the work to interfere minimally with public travel, whether vehicular or pedestrian.

#### **1.07 PARKING AND STAGING AREA**

- A. Be responsible for obtaining and maintaining parking and staging areas unless otherwise specified.
- B. Provide a minimum of four (4) dedicated parking spaces for King County Representative, personnel and consultants at Contractor Project Office location and at dock for vessel access (if different location than Contractor Project Office).

#### **1.08 CLEANING**

- A. All streets used for hauling to be kept in clean swept condition daily.
- B. Contractor to remove all trash from site on daily basis.

#### **1.09 CONTRACTOR'S OFFICE**

- A. Maintain a suitable office near the site of the work to be the headquarters of the contractor's representative authorized to receive drawings, instructions or other communication or articles.
- B. Communications given by the Project Representative or delivered at the site office in the Contractor's absence shall be deemed to have been delivered to the Contractor.
- C. Copies of the Drawings, Specifications, permits, APP and HASP per Section 01063, regulatory required items, and other Contract Documents shall be kept at the site office and in office on floating plant used for material placement and available for use at all times.

#### **1.10 TRANSPORTATION ROUTE**

- A. Select transportation route for hauling materials and equipment without creating traffic congestion.

- B. Provide details on material to be transported by barge and by truck.

### **1.11 ROAD CLOSURES**

- A. Temporary detours and road closures due to work of others shall be anticipated by the Contractor. Contractor is responsible to plan and coordinate all its operations to work with possible temporary detours and road closures.
- B. Be responsible for all additional costs resulting from temporary road closures.

### **1.12 PRIVATE ACCESS (GENERAL)**

- A. Where required by the Contract, or by choice of the Contractor, access may be over private land, in which case the access shall be maintained by and at the expense of the Contractor. Comply with all requirements of Specification Section 01062.

### **1.13 CONSTRUCTION SIGNS**

- A. Commercial or advertising signs shall not be allowed on the site.

### **1.14 Contractor Provided Office(s) for King County Project Representative and CQA staff**

- A. Contractor shall provide suitable office space both on land (minimum 10' x 20' & within 1 mile of dock for project use) and on Floating Plant (minimum 10'x 10') where in water work is being performed.
- B. Offices shall have suitable HVAC for safe and comfortable working conditions.
- C. Offices shall have suitable, safe and reliable electrical power to operate basic office equipment including computer, printer, lights and similar.
- D. On floating plant, Contractor's navigation system display available to operator shall be available to Engineer in office provided by Contractor for Engineer's use. Contractor shall provide all necessary hardware, (including minimum 24" monitor) software etc. for proper display of navigation system data in real time consistent with operator display. Contractor shall not perform any placement of ENR materials unless this system is operational and approved by the Project Representative
- E. On floating plant Contractor shall provide effective means of real time audio communication between Engineer and Operator.

### **1.15 Transportation from Shore to Contractor Floating Plant**

- A. Contractor shall provide all transportation by suitable, contractor operated vessel from dock to contractor's floating plant, to observe operations or to inspect barges or materials by Project Representative, Field Engineer (FE), and other CQA Staff, Lower Duwamish Waterway Group (LDWG) members or other County Staff or Agency representatives. Contractor shall promptly provide such access as requested by the Project Representative.

## **PART 2 PRODUCTS**

### **2.01 NOT USED.**

## **PART 3 EXECUTION**

### **3.01 RESPONSIBILITIES**

- A. Ensure all subcontractors, suppliers and individuals associated with Contract activities use approved routes.
- B. Provide required signage and Contractor oversight for approved route to ensure compliance with traffic routing requirements. If Contractor fails to abide by the approved haul routes, Project Representative will assign City off-duty police officers for enforcement of haul route

restrictions at the expense of the Contractor.

- C. Inspect haul routes daily to assure compliance with Specification Section 01560.

### **3.02 IMPROVEMENT, MAINTENANCE AND RESTORATION OF HAUL ROUTES**

- A. Be responsible for any improvements, maintenance and restoration of haul routes related to construction use.
- B. Share haul routes with business traffic and maintain in good condition. Haul routes shall remain smooth, level and suitable for owner or the public to drive passenger cars on without damage to vehicles. If pavement damage is minor due to Contractor's work, plane existing asphalt and resurface. If pavement damage is major due to Contractor's work, remove existing asphalt and replace with a minimum of 4 inches of asphalt.
- C. Restore haul routes to their initial condition after they are no longer needed for construction purposes.

**END OF SECTION**

**SECTION 01560**  
**ENVIRONMENTAL MANAGEMENT**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies environmental controls and requires a plan to describe how Contractor will manage environmental mitigation and temporary environmental controls required to be maintained during construction.
- B. The majority of the work will be performed from floating plant (excavator on spud barge, supported by material barges, tug boat(s), work skiff, survey vessels and similar) working within the Lower Duwamish Waterway (LDW) in Seattle and Tukwila, WA.

**1.02 QUALITY ASSURANCE**

- A. Referenced Standards: This Section incorporates by reference the latest revisions of the following documents. They are part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

<b>Reference</b>	<b>Title</b>
1. KCC Title 9	King County Stormwater Pollution Prevention Manual
2. KCC Title 12	King County Noise Ordinance
3. WAC 173-201A	Water Quality Standards for Surface Waters of the State of Washington
4. RCW 90.48	Water Pollution Control Standards
5. 16 U.S.C. § 1531 et seq	Endangered Species Act
6. WSDOE	Stormwater Management Manual for Western Washington
7. WAC 173-60	Noise Levels
8. RCW 70.105	Hazardous Waste Management
9. National Historic Preservation Act of 1966, 36 CFR 800	
10. Executive Order 05-05 on cultural resources	
11. Various	Local codes, regulations

**1.03 SUBMITTALS**

- A. Procedures: Specification Section 01300.
- B. Environmental Mitigation Plan and all its revisions.
- C. Waste disposal logs.

**1.04 ENVIRONMENTAL MITIGATION PLAN (PLAN)**

- A. Develop and maintain for the duration of the Contract a Plan which will effectively describe methods to incorporate and implement all required environmental protection precautions. Use the form provided by the King County Project Representative (Project Representative).
- B. Appoint an employee who is qualified and authorized to supervise and enforce compliance with the Plan. Ensure that all necessary pollution control equipment, supplies, or materials are available to implement the Plan.
- C. Plan: Address the issues in the format provided which include:
  - 1. Person Responsible
  - 2. Conservation Measures
    - A. Restriction of all in-water work activities to the authorized in-water work window for the LDW, when listed salmonid species are least likely to be present in the Action Area;

- B. Use of submerged, near bottom release by clamshell for placement of the Enhanced Natural Recovery (ENR) and ENR with granulated activated carbon added (ENR+AC) materials. This is intended to reduce the loss of granulated activated carbon (AC) as the ENR+AC descends through the water column when compared to release from above the surface. This will also limit turbidity plumes that may result as fine material in the ENR and ENR+AC becomes suspended in the water column upon its release and descent to the sediment bed;
  - C. Prewetting of the ENR+AC material prior to placement to minimize loss of AC during placement of the ENR+AC materials; and
  - D. Complying with water quality monitoring plan, implemented by KC during the ENR and ENR+AC material placement to assess turbidity down current of the pilot plots. The water quality monitoring results will be provided to Ecology and EPA. Contractor shall modify procedures as necessary, in consultation with Project Representative, to meet water quality criteria.
3. Best Management Practices (BMPs)
- A. All mechanized equipment shall be maintained in proper operating condition, with equipment inspections occurring prior to each workday. Equipment found to be leaking petroleum products or hydraulic fluid shall be removed from the site for maintenance.
  - B. Inspection of the material barge to determine whether there are significant leaks that could contribute to the exceedance of the turbidity criterion as determined by Project Representative. Contractor shall promptly repair any such leaks as identified by Project Representative.
  - C. Drip pads or pans shall be placed under mechanized equipment to contain any potential leaks of petroleum products or hydraulic fluids.
  - D. To the extent possible, vegetable-based hydraulic fluids shall be used.
  - E. A spill kit shall be kept on work vessels to contain any potential petroleum spills that might occur.
  - F. Ecology and the U.S. Coast Guard (USCG) will be contacted immediately in the event of a spill. Project Representative should also be notified immediately of any spills.
  - G. Any project-related debris or wastes shall be placed in appropriate containers for off-site disposal. No project-related debris or wastes will be allowed to enter the water.
  - H. Barges and work vessels shall not be aground on the substrate. Work barges will be held on station with spuds or anchors. Spuds, anchors or other contractor equipment shall not disturb any plot area once ENR materials have been placed in that area.
4. Site Maintenance Program per requirements of this section and permits
5. Waste Disposal per Contract requirements and requirements of the Local Authority Having Jurisdiction [LAHJ] and permits.
6. Street Cleaning per requirements of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits

7. Water and Erosion Control
  8. Air Pollution Control Measures per the requirements of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits.
  9. Noise Control Measures per requirements of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits
  10. Vibration Control and Settlement Monitoring.
  11. Tree and Plant Protection
  12. Water Quality Protection and Stormwater Control
  13. Petroleum Spill Prevention Measures per requirements of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits, including procedures for proper notification in event of spill on floating plant
  14. Chemical Storage per requirements of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits
  15. Cultural Resources per requirements of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits
  16. Erosion and Sediment Control per requirements of Specification Section 02270 and other specification sections of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits.
  17. Traffic Control per requirements of Specification Section 01570 and other specification sections of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits.
  18. Worker Protection per requirements of Specification Section 01063 and other specification sections of this Contract, the Local Authority Having Jurisdiction [LAHJ] and permits
  19. Lighting
  20. Other issues specific to the Contract Work.
- D. Submit Plan prior to initiating work activities.
- E. In the event that the County, regulatory agencies or jurisdictions determine the Plan or the Contractor's activities to be inadequate to protect environment:
1. Stop the work in progress until adequate environmental protection measures are implemented.
  2. Modify the Plan to meet the requirements of regulatory agencies, jurisdictions, and the County.
  3. Submit the revisions to the Plan prior to restarting work.

## **PART 2 PRODUCTS**

**NOT USED.**

## **PART 3 EXECUTION**

### **3.01 PERSON RESPONSIBLE**

- A. Provide a person responsible for environmental management with authority to take appropriate

action to safeguard the environment.

- B. Provide person's name and 24 hour access phone number.

### **3.02 SITE MAINTENANCE**

- A. Keep the work site, including staging areas and Contractors' facilities, clean, neat and free from rubbish and debris. Remove materials and equipment from the site when they are no longer necessary. Upon completion of the work and before request for inspection, clear the work site of equipment, unused materials, and rubbish to present a clean and neat appearance.
- B. Do not allow waste material to remain on the site of the work or on adjacent streets. Collect, carry off the site and legally dispose of such materials daily, weekly, or as otherwise specified by the Project Representative.
- C. Be responsible for obtaining necessary permits or approval for the Contractor's disposal sites.
- D. In the event that waste material, refuse, debris, and rubbish are not removed from the work site, King County reserves the right to have the waste material, refuse, debris and rubbish removed.
- E. Handle paints, solvents, fuels, oils, greases and other construction materials with care to prevent entry of contaminants into storm drains, surface waters, or soils.
- F. Unless otherwise indicated, restore ground surface to its pre-construction condition. Restore disturbed areas by replanting or repaving as soon as practical after construction.

### **3.03 WASTE DISPOSAL**

- A. Be responsible for managing and disposal of all waste generated by Contractor's activities including existing site materials required to be removed, waste from excess materials brought to the site and not incorporated into the work and waste products from the Contractor's operation such as contaminated waste solvents.
- B. Identify an employee who is responsible for managing wastes and their proper, legal disposal.
- C. Identify all wastes leaving the project site and the disposition of the waste.
- D. Submit record logs of disposition of all disposal material leaving the site

### **3.04 STREET CLEANING**

- A. Use sealed trucks for the removal of all contaminated or flowing running spoils from the construction site.
- B. Prevent dirt and dust from escaping trucks departing the work site, by covering dusty loads, washing truck tires before leaving the site, using crushed rock at entrances, or other reasonable methods.
- C. When working dump trucks and other equipment on paved streets and roadways, clean the streets no later than at the end of each day's operations and at such additional interim periods as required. Clean the area using a vacuum sweeping truck. Cleaning equipment shall be available 24 hours per day, while haul routes are in use.
- D. Contractor may use power washing trucks to clean street surface only after receiving approval from the Project Representative and only if following the best management practices to prevent exceedance of Washington State Water Quality Standards.
- E. All streets in the construction area used by Contractor's trucks or any other equipment hauling material to and from the area, whether within the Contract limits or adjacent thereto, shall be kept clean and shall be continuously serviced by the Contractor's use of sprinkling trucks to control dust.

- F. Violations of the above requirements are sufficient grounds for the Project Representative to order the streets in question to be cleaned by others with all cost withheld from the Application for Payment.
- G. Flush no untreated solid material or soils or water containing solid material or soils into receiving waters including catch basins, ditches, streams, lakes or wetlands.

### **3.05 WATER AND EROSION CONTROL**

- A. Do not allow site erosion to cause violation of the Washington State Water Quality Standards.
- B. Temporary drainage: conform to the regulations and requirements of legally authorized surface water management agencies.
- C. Prevent solids or turbid runoff from entering storm drains or local surface waters.
- D. Erosion control measures shall be installed prior to excavation, clearing, or grading activities.
- E. Erosion and sedimentation control measures shall be in place prior to any clearing or grading activity. Disturbed areas and spoils piles shall be covered, bermed, or otherwise secured when runoff from rain is or would be likely to cause turbid water that may enter local water bodies. Work shall be suspended if it cannot be performed without causing turbid runoff to leave the construction area or enter local water bodies.
- F. Temporary Dams
  - 1. Except in times of emergency, earth dams are not acceptable at catch basin openings, local depressions, or elsewhere.
  - 2. Temporary dams of sand bags, asphaltic concrete, or other acceptable material will be permitted when necessary to protect the work; however, their use should not create a hazard or nuisance to the public.
  - 3. Remove such dams from the site as soon as they are no longer necessary.

### **3.06 AIR POLLUTION CONTROL**

- A. Do not discharge smoke, dust, and other contaminants into the atmosphere that violate the regulations of legally constituted authorities. Do not allow internal combustion engines to idle for prolonged periods of time. Maintain construction vehicles and equipment in good repair. When exhaust emissions are determined to be excessive, repair or replace equipment.
- B. Use electrically-powered equipment where practical.
- C. Minimize dust nuisance by cleaning, sweeping, and sprinkling with water, or other means. The use of water, in amounts which result in mud on public streets, is not acceptable as a substitute for sweeping or other methods. Make equipment for this operation available at all times.

### **3.07 NOISE CONTROL**

- A. Noise complaints received by the Project Representative during the Work will be shared with the contractor. Contractor shall work with the Project Representative, as required, to promptly resolve noise related complaints.
- B. Noisy operations shall be scheduled to minimize their impact.
- C. Unless otherwise indicated through a noise variance, comply with local controls and noise level rules, regulations and ordinances, which apply to work performed.
- D. Each internal combustion engine, used on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated without said muffler.
- E. Noise levels for scrapers, pavers, graders and trucks shall not exceed 90 dBA and pile drivers



shall not exceed 95 dBA at 50 feet as measured under the noisiest operating conditions. For other equipment, noise levels shall not exceed 85 dBA. Equipment that cannot meet these levels shall be quieted by use of improved exhaust mufflers, noise attenuation barriers or other means.

- F. Use electric or hydraulic tools whenever practical to reduce noise.
- G. Provide notification of special circumstances or emergency conditions that require work beyond the hours specified as follows:
  - 1. Notify the Project Representative and local authority in advance of any proposed extended work hours for preauthorization. Include a written request for authorization per Section 01014 to perform work specified and the circumstances that warrant this request. Include any additional measures to mitigate noise generated by this construction activity if deemed necessary by the Project Representative.
  - 2. If an emergency situation occurs that warrants extended hours, notify the Project Representative immediately upon determining the need for this work.

### **3.08 VIBRATION CONTROL AND SETTLEMENT CONTROL**

- A. Coordinate construction activities with business operations within the work corridor that may be sensitive to construction-related vibrations.
- B. Limit construction activities around vibration-sensitive businesses or buildings. Where appropriate, use construction techniques that modify the propagation paths of the ground waves associated with vibration.

### **3.09 TREE AND PLANT PROTECTION**

- A. Unless specified to be removed, protect existing trees from damage by construction activities. Include a perimeter barrier fence (polyfence) at each tree, located at the drip-line of the tree. Unless otherwise indicated, trees may not be removed within construction limits without written approval from the Project Representative. Unless otherwise indicated, if a tree is damaged or destroyed by construction, replace in species, size and grade with a healthy tree. Should it not be practical to replace the tree, pay for damages to trees in accordance with requirements of the owner or the County, as required by the Project Representative.
- B. Restore damaged landscaped areas and other surface improvements as nearly as possible to their original condition.
- C. Minimize vegetation removal. Do not clear areas until construction activities require the work.
- D. Restore stream banks promptly to minimize erosion.

### **3.10 WATER QUALITY PROTECTION AND STORMWATER CONTROL**

- A. Conform to the regulations and requirements of legally authorized surface water management agencies. Do not allow any discharge to exceed the state Water Quality Standards.
- B. For Contract activities disturbing over one acre of soil, prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) as required by Washington Department of Ecology (WSDOE). These requirements and a template for a SWPPP are on the WSDOE website.
- C. If water quality standards or permit conditions are violated, shut down work causing the violation until protection and remediation is completed. Be responsible for all associated impacts.
- D. Be responsible for the overflow of any storm drains resulting from the addition of flow from Contractor's activities and any damages associated with such overflow.
- E. Conduct operations in such a manner as to prevent sediment, construction equipment wash water, and other pollutants from reaching existing sewers, storm drains, wetlands, and surface waters.
- F. Inspect, maintain, and repair all Best Management Practices (BMPs) on a weekly basis to

assure continued performance of their intended function. The Department of Ecology requires all on-site erosion and sediment control measures be inspected at least once every seven days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period measured at SeaTac International Airport. Keep a weekly log of the inspections for review by the Project Representative.

- G. Prevent additional construction wastes such as paper, wood, garbage, sanitary wastes, and fertilizer, from leaving the site and entering waterways. Dispose of all debris on land in such a manner that it cannot enter a waterway or cause water quality degradation.

### **3.11 PETROLEUM SPILL PREVENTION AND CONTROL**

- A. Prevent, contain, and clean the spilling of oil, fuel, and other petroleum products used. Discharge of oil from equipment or facilities into state waters or onto adjacent land is not permitted and violates state water quality regulations.
- B. At a minimum, perform the following measures regarding oil spill prevention, containment and clean-up:
  - 1. Inspect fuel hoses, lubrication equipment, hydraulically-operated equipment, oil drums, and other equipment and facilities regularly for drips, leaks, or signs of damage, and maintain and store properly to prevent spills. Maintain proper security to discourage vandalism.
  - 2. Dike or locate all land-based oil and products storage tanks so as to prevent spills from escaping into the water. Line dikes and subsoils with impervious material to prevent oil from seeping through the ground and dikes.
  - 3. Immediately contain all visible floating oils with booms, dikes, or other appropriate means and remove from the water prior to discharge into state waters. Immediately contain all visible oils on land using dikes, straw bales, or other appropriate means and remove using sand, ground clay, sawdust, or other absorbent material, and properly dispose of waste materials. Temporarily store waste materials in drums or other leak-proof containers after clean-up and during transport to disposal. Dispose of waste materials off property at a legal site.
  - 4. In the event of any oil or product discharges into public waters, or onto land with a potential for entry into public waters, immediately notify the Project Representative and the following agencies at their listed 24-hour response numbers:
    - a. WDOE, Northwest Regional Office: (425) 649-7000.
    - b. U.S. Coast Guard: (206) 286-5540.
  - 5. As a minimum, maintain on floating plant, and restock as necessary to ensure an adequate and continuous supply, the following materials:
    - a. Oil-absorbent booms: 8 each, 50 feet long each.
    - b. Oil-absorbent pads or bulk material, adequate for coverage of 200 square feet of surface area.
    - c. Oil-skimming system, if appropriate.
    - d. Oil absorbent material, such as kitty litter or sawdust, for material spills on land or deck, gloves for use when performing the work and plastic bags to collect the used material.

### **3.12 CHEMICAL STORAGE**

- A. Store solid chemicals, liquid chemicals, paints, petroleum products, caustic solutions, and waste materials including batteries and electronic components to prevent entry of contaminants into all waters including groundwater.

- B. Store to prevent spillage in the event of overfilling, tipping or rupture.
- C. Store on impervious surfaces with impervious berms able to contain 110% of the storage volume.
- D. Protect from vandalism
- E. Cover stored liquids
- F. Designate waste storage areas with the appropriate hazardous labels.
- G. Segregate non-compatible or reactive chemicals to prevent possibility of mixing
- H. Store all 'empty' containers not cleaned in upright secure manner.

### 3.13 CULTURAL RESOURCES

- A. Attention is directed to the National Historic Preservation Act of 1966, 36 CFR 800 and Governor's Executive Order 05-05 which provide for the preservation of potential historical, architectural, archaeological or cultural resources (herein termed "cultural resources").
- B. King County intends to conform to the applicable requirements of the National Historic Preservation Act of 1966 as it relates to the preservation of cultural resources and fair compensation to the Contractor for delays resulting from such cultural resources investigations.
- C. In the event potential cultural resources are uncovered during subsurface excavations at the worksite, the following procedures will be instituted:
  - 1. Reference Inadvertent Discovery Plan included as an attachment to 01560.
  - 2. King County will issue a Work Suspension Order directing the Contractor to cease all construction operations at the location of a potential cultural resources discovery. King County will contact a professional archaeologist to evaluate the significance of the find.
  - 3. Such Work Suspension Order will be effective until such time as the qualified archaeologist can evaluate the potential cultural resources for their significance and make recommendations to the State Historic Preservation Officer. Any Work Suspension Order will contain the following:
    - a. A clear description of the work to be suspended.
    - b. Any instructions regarding issuance of further orders by the Contractor for material services.
    - c. Guidance as to action to be taken by subcontractors.
    - d. Specific direction to the Contractor to minimize the work suspension costs (i.e., work elsewhere while archaeologist is evaluating find).
    - e. Estimated duration of the temporary suspension.
  - 4. If the archaeologist determines that the cultural resource is eligible for the National Register of Historic Places, King County will extend the duration of the Work Suspension Order in writing.
- D. Inadvertent Discovery of Potential Archaeological Resources: *Contractor Responsibilities – Immediately Upon Discovery:*
  - 1. If workers discover a potential archaeological resource, the Contractor is responsible for taking the following steps:

- a. Immediately securing and protecting the discovery by suspending all ground disturbing activities within approximately 30 feet of the discovery, and cordoning off the discovery area;
- b. Securing all spoils piles or trucks that may contain materials originating from the discovery area;
- c. Collecting basic information (date/time, location and depth of discovery, personnel and equipment involved, general description of discovery), with photographs or illustrations if possible; and
- d. Immediately notifying the Project Representative.

### **3.14 Light**

- A. Complaints about lighting and spillage onto adjacent properties received by the Project Representative during the Work will be shared with the contractor. Contractor shall work with the Project Representative, as required, to promptly resolve light related complaints.
- B. Control excess light and light spillage from project area into adjacent properties.
- C. Promptly address any light complaints or concerns to satisfaction of the Project Representative.

### **3.15 FINES**

- A. Be responsible for all fines incurred from non-compliance with regulations of governing authorities.

**END OF SECTION**

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**Specification Section 01560**

**Attachment A**

**Inadvertent Discovery Plan**

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## **INADVERTENT DISCOVERY PLAN**

### **ENHANCED NATURAL RECOVERY/ACTIVATED CARBON PILOT STUDY LOWER DUWAMISH WATERWAY**

#### **Introduction**

The Lower Duwamish Waterway Group (LDWG) will conduct a pilot study of an innovative sediment technology in the field to evaluate the potential effectiveness of the technology in the Lower Duwamish Waterway (LDW) in Seattle, WA. The study will evaluate whether enhanced natural recovery (ENR) material amended with activated carbon (AC) can be successfully applied to reduce bioavailability in remediated contaminated sediment in the LDW.

#### **Area of Potential Effects**

Three plot areas for the pilot study designated as intertidal, subtidal, and scour plots, will be located in the LDW at approximately river mile 0.01, 1.2 and 3.9 in Seattle and Tukwila, King County, Washington. The project will require the placement of ENR material and ENR+ AC material in the LDW using a barge mounted fixed arm excavator with a clamshell bucket and does not require dredging of any sediments.

King County Historic Preservation Program (HPP) reviewed this project in August 2015, and concluded that the area of potential effects (APE) has a low probability of containing intact archaeological resources because all sites are located within the active river channel. HPP recommended that King County Wastewater Treatment Division WTD have an inadvertent discovery plan (IDP) in place during construction.

This IDP outlines procedures to follow if archaeological materials or human remains are discovered during construction associated with the project.

#### **Regulatory Context**

LDWG is conducting the project under an Administrative Order on Consent with the US Environmental Protection Agency (EPA) and the Washington State Department of Ecology (DOE); therefore EPA is the lead agency for this project. Because the project is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) action, regulatory permits are not required but the project must be conducted in a manner that meets substantive provisions of applicable regulatory requirements.

The project is also subject to state laws governing cultural resources, including Archaeological Sites and Resources (RCW 27.53), Indian Graves and Records (RCW 27.44), Human Remains Law (RCW 68.50), and Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60). HPP reviewed the project for potential impacts to cultural resources as required by King County Executive Procedures for Cultural Resources (LUD 16-1 AEP).



### **Archaeological Resources**

Archaeological resources include artifacts and features (such as prehistoric hearths). It is important to remain alert to unusual things, since every situation is unique. When in doubt, assume the material is an archaeological resource.

Some examples of potential archaeological resources are listed below. Photographs of typical archaeological resources are shown in Exhibit B.

#### *Prehistoric Archaeological Resources*

- Arrowheads or other stone tools, such as flakes of fine-grained stone
- Fragments of basketry, cordage, nets, or traps made of wood or bark
- Dark, slightly greasy layers of soil, perhaps with charcoal and/or broken rocks
- Soil with fragments of bone (fish, bird, mammal) and/or shell (freshwater or marine)
- Fire-darkened or -reddened rock, usually broken, and/or fire-reddened layers of soil

#### *Historic Archaeological Resources*

- Glass that is thicker or of different colors than modern beverage bottles
- Clusters of tin cans or bottles
- Brick
- Ceramics/pottery
- Wood posts or clusters of timber
- Logging or agricultural equipment that appears to be older than 50 years
- Constructed grades

### **Inadvertent Discovery of Potential Archaeological Resources**

#### ***Contractor Responsibilities – Immediately Upon Discovery***

If workers discover a potential archaeological resource, the Contractor is responsible for taking the following steps:

1. Immediately securing and protecting the discovery by suspending all ground disturbing activities within approximately 30 feet of the discovery, and cordoning off the discovery area if possible;
2. Securing all spoils piles, barges or trucks that may contain materials originating from the discovery area;
3. Collecting basic information (date/time, location and depth of discovery, personnel and equipment involved, general description of discovery), with photographs or illustrations if possible; and
4. Notifying the WTD Project Representative or Inspector.

***Protecting the Discovery Area***

Apart from actions immediately needed to assess or protect the discovery, such as covering or stabilizing soil, *ground-disturbing activity must be stopped within 30 feet of the discovery site*; construction may continue outside this area. Ground-disturbing activity within this 30-foot buffer may not resume until:

1. a professional archaeologist recommends a more situation-appropriate buffer to adequately protect the potential archaeological site, which is approved by HPP;
2. the discovery has been determined not significant by the Washington State Historic Preservation Officer (SHPO); or
3. the discovery has been determined significant and WTD, LDWG, HPP, EPA, SHPO, and consulting parties including affected Tribes have agreed upon a course of action.

***WTD Responsibilities – Immediately Upon Discovery***

The WTD Project Representative or Inspector will contact the WTD Environmental Planner and WTD Project Manager assigned to the project immediately. If possible, the WTD Project Representative or Inspector will provide photographs or illustrations of the discovery and information on its geographical location.

The WTD Environmental Planner will then contact HPP (Archaeologist Phil LeTourneau or Preservation Planner Charlie Sundberg) and other professional archaeologists as necessary to determine whether the discovery represents an archaeological site.

***Archaeological Sites and Eligible Archaeological Resources***

Federal, state, and local laws protect all prehistoric archaeological sites and those historic archaeological sites that have been listed OR determined eligible for listing in National Register of Historic Places (NRHP). Determining the eligibility of newly identified archaeological sites for listing in the NRHP generally requires two steps: 1) evaluation by and recommendation from a professional archaeologist and 2) concurrence from SHPO.

Isolated artifacts, both prehistoric and historic, are not considered “sites” under state and federal law and may not require special protection. *The determination of whether a discovery represents an archaeological site is the responsibility of a professional archaeologist.*

***WTD Responsibilities – Determining Appropriate Course of Action***

If HPP, or another professional archaeologist contacted by the WTD Environmental Planner at the time of the discovery, makes a preliminary determination that the discovery is an archaeological site, the WTD Environmental Planner will arrange, in coordination with the WTD Project Representative, WTD Project Manager and LDWG, for a professional archaeologist to document and evaluate the discovery. *On-site evaluation will occur within one day of its preliminary determination as an archaeological site.* The professional archaeologist will provide the WTD

## Inadvertent Discovery Plan

Environmental Planner and the WTD Project Representative with a description of the discovery and a preliminary determination of whether or not it is significant. If the find is determined not significant, work may proceed without further delay. If it is determined to be significant, it will be recorded by a professional archaeologist on State of Washington inventory forms. Site overviews, features, and artifacts will be photographed; stratigraphic profiles and soil/sediment descriptions will be prepared for subsurface exposures. Discovery locations will be documented on scaled site plans and site location maps.

If the find is determined to be significant the WTD Environmental Planner will then communicate this information to EPA, who will contact SHPO unless EPA has delegated this responsibility to WTD. SHPO will determine whether additional archaeological work is necessary at the site. If SHPO determines the discovery is eligible for listing, the WTD Project Representative will issue a formal Stop Work order within the buffer recommended by the professional archaeologist who evaluated the site. The buffer will be adequate to provide for the total security, protection, and integrity of the site. The buffer will be of a size and extent practicable to provide maximum protection to the resource while allowing for agency functions mandated by law, related to health, safety or environmental concerns. The archaeologist may direct work away from the site to work in other areas prior to contacting the concerned parties.

### **Discovery of Human Remains**

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect.

#### ***Contractor Responsibilities – Immediately Upon Discovery of Human Remains***

If workers believe they have discovered human skeletal remains, the Contractor is responsible for taking the following steps:

1. Immediately securing and protecting the discovery by suspending all ground disturbing activities within approximately 50 feet of the discovery, and cordoning off the discovery area; and
2. Notifying the WTD Project Representative or Inspector immediately.

#### ***WTD Responsibilities – Immediately Upon Discovery of Human Remains***

The WTD Project Representative or Inspector shall first notify the King County Medical Examiner's Office and Seattle Police Department, and then notify the WTD Environmental Planner. The WTD Environmental Planner will contact HPP (Archaeologist Phil LeTourneau or Preservation Planner Charlie Sundberg) and EPA. A 50-foot work stoppage area shall be maintained around the discovery. Vehicles, equipment, and unauthorized personnel shall not be permitted to traverse or enter the discovery site. Construction excavations may continue outside the 50-foot work stoppage area. Remains will be covered with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. Employees and contractors will not call 911 or speak with the media regarding such a discovery.

## Inadvertent Discovery Plan

The Medical Examiner will assume jurisdiction over the human skeletal remains and make a determination as to whether those remains are forensic or non-forensic. These persons will wear appropriate personal protective equipment (e.g., Tyvek suit, boot covers, and latex gloves) and will be escorted by an individual with 40-hour HAZWOPER training. Law enforcement or the coroner may require remains to leave the site without decontamination.

If the remains are forensic, the Medical Examiner will determine appropriate procedures for their disposition. If the remains are non-forensic, the State Physical Anthropologist (at the Department of Archaeology and Historic Preservation (DAHP)) will assume jurisdiction over the remains. The State Physical Anthropologist will make a determination as to whether the remains are Indian or Non-Indian and report that finding to EPA and appropriate Tribes and cemeteries. EPA will handle all consultation with SHPO and the affected parties as to the future preservation, excavation, and disposition of the remains.

No persons other than the proper law enforcement personnel, professional archaeologists, HPP staff, and SHPO staff shall be authorized direct access to the discovery location after the area is secured.

Inadvertent Discovery Plan

**Contact Information**

***King County Wastewater Treatment Division***

Meredith Redmon, Environmental Planner (206) 477-5488 office  
Randy Brunke, Project Representative (206) 477-5654  
Jennifer Kauffman, Project Manager (206) 477-5449 office

***King County Historic Preservation Program***

Philippe D. LeTourneau, Archaeologist (206) 477-4529  
Charlie Sundberg, Preservation Planner (206) 477-4538

***Department of Archaeology and Historic Preservation***

Dr. Rob Whitlam, State Archaeologist (360) 586-3080  
Stephenie Kramer, Assistant State Archaeologist (360) 586-3083  
Dr. Guy Tasa, State Physical Anthropologist (360) 586-3534

***EPA***

Allison Hiltner, Project Manager (206) 553-2140  
[TBD], Archaeologist [TBD]

***King County Medical Examiner's Office***

(206) 731-3232

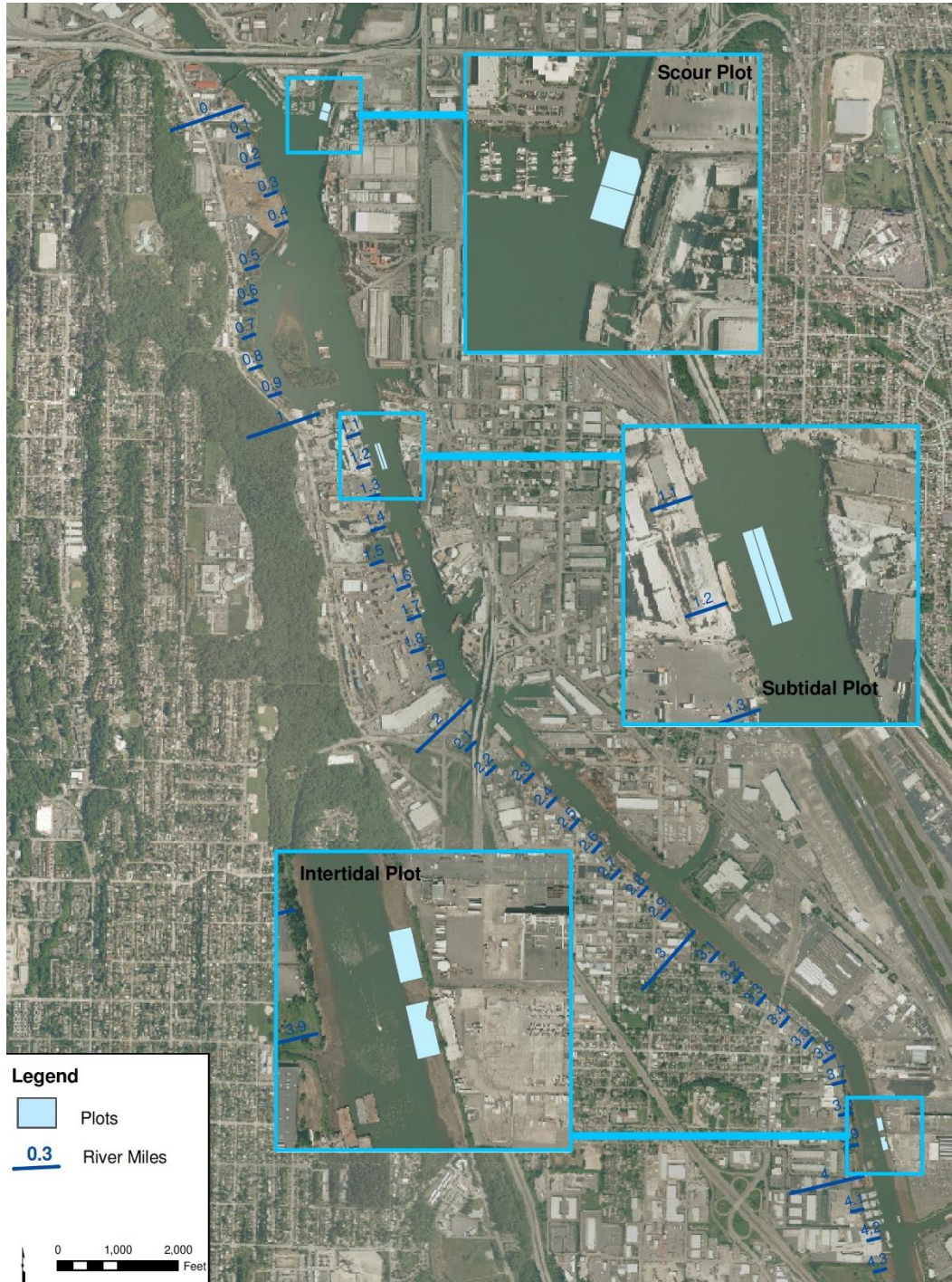
***Seattle Police Department*** (non-emergency)

(206) 625-5011

***Potentially Affected Tribes*** – TO BE CONTACTED ONLY BY WTD

[TBD by LDWG]

### Exhibit A. Area of Potential Effects





**Exhibit B. Examples of Buried Cultural Resources**



*Stone artifacts*



*Fiber artifacts*



*Historic artifacts*



Inadvertent Discovery Plan



*Distinct layers of shells or historic debris*



Inadvertent Discovery Plan



*Unusual groupings of rocks, or fire-modified rocks*

**SECTION 01720**  
**AS-BUILT DRAWINGS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies providing as-built drawings and other record documents and information. For this Contract, the terms as-built drawings and record drawings are considered interchangeable and synonymous.

**1.02 SUBMITTALS**

- A. Procedures: Specification Section 1300.
- B. As specified:
  - 1. For CAD produced electronic files of as constructed information: external USB drive or equal.

**PART 2 PRODUCTS**

**2.01 GENERAL**

- A. Marked-up Contract Documents: Continuously maintain, update and correct mark-up information in dwg format. As-Built drawings and information shall be continuously updated to show:
  - 1. Work accomplished to verify payment due.
  - 2. Field changes of dimensions and details made by Contractor.
  - 3. Changes made by Change Order, responses to Request for Information or Field Directives.
  - 4. Dimensional location of all embedded, buried and concealed features as discovered or placed by Contractor. Items not located or shown on the Drawings but placed by Contractor shall be recorded and provided to the County as prescribed in this Section.
  - 5. Locations of all spud sets within the Plot boundaries shall be recorded and provided to the County as prescribed in this section.
- B. Record to the level of detail and accuracy and in units consistent with the Contract Drawings

**2.02 SUPPLEMENTAL CONTRACTOR PRODUCED DOCUMENTS**

- A. When technical specifications require Contractor to produce information supplemental to that in the bid documents, produce and submit per the following CAD Construction Detail Drawings and Records requirements:
  - 1. Submit Hard copy as well as electronic format copy:
    - a. Drawings shall be AutoCAD 2010 or newer ".dwg" format files.
    - b. Drawings on 11-inch by 17-inch paper.
    - c. Information prepared by the Contractor for construction or installation which is supplemental to the information and detail on the Contract Drawings and as required in the Specifications.
    - d. Reference appropriate Contract Drawings which show the work.

## **PART 3 EXECUTION**

### **3.01 MARK UP COLORS**

- A. For mark-ups to the Contract set of Documents use CAD as required to maintain as-built drawings described in this section using the following color coding:
  - 1. Red: Document changes
  - 2. Orange: Dimensional and other notations
  - 3. Green: Work deleted

### **3.02 ELECTRONIC MEDIA DRAWINGS**

- A. All drawings provided in electronic format shall be provided on an external USB flash drive in AutoCAD, Release 2010 or newer, "dwg" and in "PDF" format files with borders and title blocks clearly identifying the Contract and drawing number. Each file shall include the drawing number and drawing title in the filename. The equipment and the scope of the drawing shall be as required in the specifications.
- B. Drawing quality and size of presentation legible at a 50 percent reduction of such drawings; reduced drawings will be used for insertion in operations and maintenance manuals.
- C. Text size: 0.125 inch for 22 x 34 inch drawings, 0.063 inch for 11 x 17 inch drawings.
- D. When requested by the Contractor, the Project Representative will provide electronic copies of the original Contract Drawings in AutoCAD "dwg" format.

### **3.03 RECORDING**

- A. Record information concurrently with construction progress. No work shall be concealed until the required information is recorded.

### **3.04 DELIVERY TO PROJECT REPRESENTATIVE**

- A. As-Built drawings will be used to verify and document progress as stated in progress payment request per Specification Section 01311. Work not included in the As-Built drawings is not documented as performed and will not be included for payment in progress payment requests.
- B. Prior to request for notice for substantial completion of any area or system on the project, transmit document including Contract title, date, Contractor's name and address, index with title and number of each record document, statement indicating completion of record information for specific areas or, if for project close-out, that the documentation is completed and in compliance with Contract requirements attested by the signature of the Contractor or the Contractor's authorized representative.
- C. Acceptance will not begin until draft copies of electronic and hard copy As-built documents are received and approved by the Project Representative. Revise As-built documents as a result of any changes made or discovered during commissioning.

**END OF SECTION**

**SECTION 02221**  
**BACKFILL (ENR & ENR + AC MATERIAL PLACEMENT)**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. The Work includes thin layer placement (6 to 9 inch target thickness) of Enhanced Natural Recovery (ENR) material or ENR material with granular activated carbon added (ENR+AC) at three locations (Plots) in the Lower Duwamish Waterway (LDW) using precision, instrumented fixed arm excavator with clamshell bucket, modified as necessary (or alternate to clamshell as approved by the Project Representative). This Section specifies requirements for the performance of the Work.
1. Each Plot area is roughly 1 acre in total size. Plots will be monitored by others for three years following construction. All Plots must be constructed in similar manner to provide similar baseline for monitoring at the various Plots. At each of the three plot locations, two separate subplots will be constructed. Each subplot is roughly ½ acre in size. At each plot location, one subplot will be constructed of ENR Material only (Sand or Gravelly Sand) and one subplot with the same ENR Material (Sand or Gravelly Sand) blended with Activated Carbon (AC) at 4% by weight. Sand ENR Material or Sand plus AC ENR Material shall be used at the subtidal plot and gravelly sand ENR Material or gravelly sand plus AC ENR Material shall be used at the Intertidal and Scour plots.

**1.02 QUALITY ASSURANCE**

- A. Referenced Standards: This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.

<u>Reference</u>	<u>Title</u>
Chapter 296-62 WAC	WISHA General Occupational Health Standards
Chapter 296-67 WAC	WISHA Process Safety Management Standards
Chapter 296-155 WAC	WISHA Safety Standards for Construction
RCW 49.17	Washington Industrial Safety and Health Act (WISHA)
EM 1110-2-1003	USACE Hydrographic Surveying Manual (EM 1110-2-1003, 11/30/2013, US Army Corps of Engineers)

**1.03 SUBMITTALS**

- A. Contractor Work Plan as detailed in Part 1.07 of this Section and Specification Section 01300.
- B. Contractor Quality Control (CQC) Plan as detailed in this Section.
- C. Contractor's Construction Schedule (to be updated weekly throughout performance of Work), as detailed in Specifications Section 01311.
- D. Daily Reports as described in Specification Section 01300.
- E. Weekly Reports as described in Specification Section 01300.
- F. Monthly Report as described in Specification Section 01300

- G. Environmental Protection Plan (EPP) including Spill Contingency Plan as described in Specification Section 01560.
- H. Contractors Health and Safety Plan as described in Specification Section 01300.
- I. ENR & ENR + AC Positioning and Navigation Systems Equipment List, Specifications, System description and verification methods as detailed in Specifications Section 02221 Part 3.03.
- J. All Progress Surveys and Post- ENR & ENR + AC Placement Surveys performed by Contractor as detailed in Specifications Section 02221 Part 3.01 of this Specifications section.
- K. ENR & ENR + AC material: Submit sample for each source and type of ENR & ENR + AC material to be used in the work.
- L. Multibeam bathymetric survey results as detailed in Specifications Section 01050, section 3.05 of this Specification Section and Specification Section 01300.
- M. Daily bucket placement files for ENR material placement in test placement areas or sub plots.

#### **1.04 BACKFILLING (ENR & ENR + AC MATERIAL PLACEMENT)**

- A. The Project Area consists of three placement areas called "Plots", each approximately one acre in size, located within the Lower Duwamish Waterway. The three plots are referred to as the Intertidal Plot, Subtidal Plot and Scour Plot and are shown on the project Plans.
- B. Each Plot has been subdivided into two subplots, each approximately ½ acre in size. At each Plot site, one subplot will be constructed using ENR Material and the second subplot constructed using ENR+AC material. The ENR Material will be Sand for the Subtidal Plot and Gravelly Sand for the Intertidal and Scour Plots.
- C. Materials shall be placed using an instrumented, precision, fixed arm excavator with rotating clamshell bucket, modified as necessary to meet project objectives (or alternate as approved by Project Representative) and real time navigation system.
- D. Real Time Navigation system may consist of any combination of positioning equipment including RTK GPS, gyro-compasses, angle indicators, computers, software or other equipment necessary to achieve +/-4" accuracy in X, Y, and Z axis, relative to the Project Datums, of the clamshell bucket in real time throughout ENR & ENR + AC placement operations.
  - 1. Navigation system shall provide the operator real time digital information and graphical display of the equipment position, existing bathymetry, design placement elevation and actual bucket elevation. The system shall record the horizontal position and elevation at which the bucket is opened on each ENR & ENR + AC placement (each bucket position recorded at time of opening). The system shall display both plan view and cross section view of the placement area, floating platform including spuds and excavator, and the clamshell bucket.
  - 2. The Contractor shall provide and set-up all equipment necessary to provide real time telemetry of all operator available data to the Project Representative at the office on floating plant for use by Project Representative. This includes data telemetry and all computer and display equipment.
  - 3. The Contractor shall promptly provide all required service to the positioning and the telemetry systems for the duration of the Work. Contractor shall have personnel qualified in the systems' operations, setup and troubleshooting onsite whenever Work is being performed.
  - 4. Contractor shall not perform material placement if navigation and positioning system is not fully operational and performing as required.
- E. The Work consists of installing a suitable indoor work station for an ENR & ENR + AC placement observer (Field Engineer) on the ENR & ENR + AC placement plant in the vicinity of the equipment operator. This work station shall be equipped with:

1. Real time display of navigation system similar to operator display in cab on screen at least 24" size.
2. Suitable AC power for computer, lights and similar
3. Adequate line of sight to observe placement operations including unobstructed view of the material barge, placement location and clamshell bucket when above water surface. Location shall allow observer to see into the material barge to see bucket pick up material from within material barge.
4. Small desk or table and chair.

#### **1.05 UTILITIES (UNDERGROUND, OVERHEAD ETC.)**

- A. It is the Contractor's responsibility to ascertain the locations and depths of any and all utilities or pipelines that may be buried below the waterway in the work area as well as potential overhead utilities in the work area or crossing the Waterway itself. It will also be the Contractor's responsibility to repair, at the Contractor's expense, any damage to overhead or buried utilities or pipelines caused by the placement operations or other related vessel operations to the pre-project condition.

#### **1.06 MISPLACED MATERIAL**

- A. Should the Contractor, during the execution of the work, lose, dump, throw overboard, sink or misplace anything whether it is material (includes sediment, debris etc.) or equipment, the dredge, barge, machinery, or an appliance, the Contractor shall promptly recover and remove the same. The Contractor shall give immediate verbal notice, followed by written confirmation, of the description and location of such material or equipment to the Project Representative and shall mark and buoy same until they are removed. Should the Contractor refuse, neglect, or delay compliance with this requirement, such material or equipment may be removed by the Project Representative, and the cost of such operations may be deducted from any money due to the Contractor, or may be recovered from his bond. The liability of the Contractor for the removal of a vessel wrecked or sunk without his fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the River and Harbor Act of 3 March 1899 (33 U.S.C. 410 et seq.).

#### **1.07 CONTRACTOR WORK PLAN**

- A. Not later than 30 calendar days after the Notice to Proceed, the Contractor shall submit to the Project Representative a detailed, written project Contractor Work Plan. The outline for the Contractor's Work Plan is included as Attachment A to this Specification Section and shall be used by Contractor in preparing their Work Plan. Contractor shall meet with Project Representative (Work Plan Meeting) prior to Work Plan preparation to review Work Plan contents and address any Contractor questions.
- B. As shown in the outline, the plan shall contain the following:
  1. Source of ENR & ENR + AC materials and the methods, procedures and equipment to be used for ENR + AC blending and transportation to site and storage of material. This should include details of any material rehandling steps.
  2. Methods, procedures, and equipment for coordinating and performing multi beam hydrographic surveys. Provide details on survey equipment to be used (Manufacturer, Model, Year, Frequency (if applicable), Transducer Type (if applicable))
  3. Methods, procedures, and equipment for placing ENR & ENR + AC material including:
    - a. Excavator - Description of fixed arm excavator including type, size, model, year, boom and stick configuration, maximum depth below waterline for bucket pattern full width of barge, in 2 placement rows.

- b. Navigation and positioning system – provide details on each component (Manufacturer, Model, Year, Accuracy, and resulting accuracy at clamshell bucket. Include Manufacturers specification sheet for each piece of navigation system).
  - c. Clamshell bucket type, size and manufacturer (or similar if other than clamshell is proposed by Contractor. Contractor may propose alternate to clamshell bucket for review and approval by Project Representative). Detail any proposed or potential modifications to clamshell bucket to improve material placement.
  - d. Spud Barge for excavator – description of spud barge on which excavator will be operated from, including barge dimensions (L, W, D), draft (when loaded and ready to perform placement operations).
  - e. Detailed description of how demonstration placement will be performed and how placement will be adjusted during demonstration to achieve project objectives.
  - f. Description of how ENR + AC material will be blended, loaded, handled, pre-soaked in barge and then placed to achieve project objectives.
  - g. Placement grid – initial grid based on bucket footprint and target 4.5” lift thickness which will then be tested during placement test and adjusted prior to placement of additional material within the Duwamish Waterway beyond limits of test plot area.
  - h. ENR & ENR + AC barges – details on ENR & ENR + AC barge size, load table, type, configuration, bin depth, capacity, draft (empty and loaded).
  - i. Barge Water Handling Equipment – description of equipment and procedures for pumping saline water from Duwamish Waterway into barges to pre-saturate AC, method to pump water from barges thru 1 micron bag filters prior to discharge to waterway. Barge Water Handling System including pumps, filters, pipelines etc. and shall be capable of 800 GPM flow rate during use.
  - j. Tugs - details on tug size, draft, drive type, horsepower.
4. Order in which the work is to be performed, indicating the work sequence; number, types, and capacity of equipment to be used; hours of operation; methods of operation; and the time required to complete each activity (based on each subplot). A list of key personnel and supervisory chain and contact information (email and cell phone) will be included.
  5. Methods, procedures, and equipment for environmental protection and monitoring, including procedures for emergency spill containment and removal operations.
  6. Contingency actions that will be used in the event that ENR or ENR + AC placement causes water quality exceedances.
  7. Notification and procedures to be used for moving ENR & ENR + AC materials and equipment to accommodate commercial vessel traffic using the waterway. Operations will be coordinated and scheduled to reduce interference with this traffic.
- C. Contractor shall submit in accordance with Submittals Specification Section 01300. Not later than 45 calendar days after the Notice to Proceed, the Contractor shall submit to the Project Representative a revised Contractor Work Plan in general conformance of the Contract (Review Action 1 or Review Action 2 with all markings incorporated).

## **1.08 CONTRACTOR QUALITY CONTROL PLAN**

- A. As an Attachment to the Contractor Work Plan, Contractor shall prepare and submit Contractor Quality Control Plan (CQCP).

1. In the CQCP Contractor shall detail:
  - a. Testing and inspections to be done by the Contractor as directed in the project specifications,
    - i. Methods for daily verification of Navigation and Positioning System
  - b. Any other testing and inspections required to verify that the work meets the project specifications,
  - c. Procedures for controlling the quality of construction work,
    - i. Methods to control fill factor in bucket during placement
    - ii. Methods to control water level within ENR+AC material barge during placement
  - d. Procedures to document construction activities that affect the quality of work performed,
    - i. Details of Hydrographic Survey Equipment, procedures, lead surveyor qualifications and licensing
  - e. QA/QC procedures for all construction project monitoring, and
  - f. Specify corrective actions to be performed in the event of over-placement, under-placement, or placement outside of the specified area for the ENR and ENR+AC material.

## **PART 2 MATERIALS**

### **2.01 IMPORTED MATERIALS**

- A. Granular Activated Carbon (AC): Virgin, not regenerated carbon – Coconut fiber as source material. Sample of material, vendors name, manufacturers name, manufacturer's specification sheet, grain size testing results shall be submitted to Project Representative no more than 21 days after Phase 1 Notice to Proceed and at least 15 days prior to ordering AC for review and approval of proposed AC material. AC shall be relatively well graded across the grain size range of 200 to 1000 microns and approved by Project Representative. Contractor shall not order AC material for project until they have received written approval from the Project Representative.
- B. Contractor shall leave sufficient time to determine alternate source, resubmit new sample and required submittals as described above and receive approval from Project Representative without delaying project, should first source be rejected by Project Representative for any reason.
- C. AC - Total PCBs must not exceed lowest cleanup levels shown in LDW Record of Decision Tables 19 and 20, based on analysis to be performed by County. The Contractor shall provide samples of all material as requested by the Project Representative for QA testing.
- D. Gravelly Sand ENR Material: Granular material which meets WSDOT Standard Specification 9-03.11 for Streambed Aggregates with the following gradation (modified from WSDOT standard) to contain minimum 50% sand (<4.75mm [#4 sieve] AASHTO):



<b>GRAVELLY SAND ENR MATERIAL</b>	
U.S. Standard Sieve Size	Percent Passing by Dry Weight
1-1/2"	100
3/4"	80-90
3/8"	50-80
U.S. No. 4	50% min
U.S. No. 16	10-30
U.S. No. 200	0-2

- E. Sand ENR Material: Granular material meeting WSDOT Standard Specification 9-03.1(2)B for "Class 2 Sand", with gradation as follows:

<b>SAND ENR MATERIAL</b>	
U.S. Standard Sieve Size	Percent Passing by Dry Weight
3/8"	100
U.S. No. 4	95-100
U.S. No. 16	45-80
U.S. No. 50	10-30
U.S. No. 100	2-10
U.S. No. 200	0-2

- F. ENR Materials (Sand and Gravelly Sand) must not exceed Washington State Department of Ecology SMS for Metals and total PCB's must not exceed lowest cleanup levels shown in LDW Record of Decision Tables 19 and 20. The Contractor shall provide samples of all material as requested by the Project Representative in quantity and format requested for analyses to be performed by the County

## **2.02 BORROW SOURCE**

- A. ENR & ENR + AC material shall be from sources approved by the Project Representative and EPA/Ecology. Borrow supplier must have capability of thoroughly blending AC with borrow material with certified weight conveyors as material is loaded onto a barge.
- B. All Granular material must be tested and determined to meet project specifications prior to blending or import. The Contractor shall provide samples to the Project Representative for testing.
- C. The Contractor shall insure imported materials are natural, native, virgin materials of good quality, free of contaminants, including debris or recycled materials, and meet contract specifications. The Project Representative maintains the right to reject any materials which do not comply with the stated standards. In the event of rejection, it shall be the responsibility of the Contractor to remove all rejected material from the site and replace with suitable material.
- D. The Contractor shall provide documentation of origin of borrow source material and maps identifying specific location of borrow source to the Project Representative.
- E. The Contractor shall inspect the borrow source prior to material import. During the inspection, the Contractor shall assure that the materials to be delivered to the site are likely to meet the appropriate specifications. Contractor shall provide Project Representative one week's notice of such inspections. At Project Representative's discretion, Project Representative may accompany the Contractor to witness such inspections. This witnessing shall in no way release the Contractor from complying with the specifications and in no way shall be construed as

approval of any particular source of material.

- F. Upon selection of a source of Sand and gravelly sand materials to be imported, Project Representative will visit the source and collect sample(s) for analyses to verify compliance with Project criteria.
- G. At time of ENR material and AC blending, Project Representative will observe blending and collect samples of blended material to verify AC content. Contractor shall provide Project Representative at least 3 days' notice, by email, of all AC blending and barge loading activities. Any barges loaded without proper notification to the Project Representative may result in rejection of material at Project Representatives discretion at sole expense of contractor.
- H. The Contractor shall visually inspect each barge of imported material upon delivery prior to placement. Material shall be inspected for presence of foreign, recycled, or reprocessed material. Project Representative may at any and all times perform an independent inspection. Material may be rejected due to identification of material not meeting the contract specifications or as a result of test results not meeting the contract specifications. Materials may be segregated for testing based on appearance or odor. Segregated material may be tested according to designated procedures at the discretion of Project Representative.

### **2.03 MATERIAL PREPARATION**

- A. ENR Material (Sand or Gravelly Sand as required) + AC shall be thoroughly pre-blended to reach uniform, target concentration (nominal 4% AC, dry weight basis based on blend quantities of ENR and AC) at time of barge loading. AC content to be measured by Project Representative in roughly 1 sample per every 500 tons collected by Project Representative at time of barge loading. This is for information purposes only as acceptance criteria will be based on dry weight blend quantities.
- B. Prior to placement, blended ENR+AC Material shall be loaded onto a suitable, watertight barge. Barge shall be capable of holding appropriate quantity of soaked material for efficient placement with adequate freeboard to prevent overtopping.
- C. Blended ENR+AC Material shall be pre-soaked within flooded, water tight (bin) barge for a minimum of 12 hours prior to placement, or placement demonstration as described in 3.02. Water level in barge should be kept at least 1-2 inches above the material, as practicable (can be slightly deeper provided barge stability is not a concern). As material is removed from the barge, pump the water from the barge (using a bag filter 1 micron sizing to remove turbidity and comply with WQ Memo) in order to maintain approximately a 1-2" water depth above the material
- D. Once on-site, ENR+AC Material shall be kept saturated at all times to extent practicable prior to and during placement.
- E. ENR material that is not amended with AC should be loaded in suitable barge capable of holding appropriate quantity of material for efficient placement with adequate freeboard to prevent overtopping. Pre-soaking of ENR material that is not amended with AC is required.

### **2.04 MATERIAL QUANTITY**

Quantities shown below are the Base Quantity for the Contractor to blend and mobilize to the site. Additional material may be needed, as directed by the Project Representative.

- A. Base quantity determined using 9 inches (0.75 feet) average thickness over the placement area, a 1:4 slope (V:H) of ENR material around plot to meet existing grade, 5% loss allowance (material left on barge, lost during test placement, lost during placement) and 1.7 tons per cubic yard conversion factor (in water placed density of ENR material), and a 4% by weight AC

addition. Actual quantity required to complete plots may vary based on actual field conditions, placement tolerance and accuracy, quantity lost on barge during demonstration and placement and similar. If base quantity results in extra material remaining on barge after required placement area is completed to PR satisfaction, extra material shall be placed adjacent to plots as shown on the Plans after approval from PR to perform such placement. If Base Quantity is insufficient Contractor shall import additional material as directed by the Project Representative.

<b>ENR Material Quantity</b>						
<b>Estimate</b>	<b>Intertidal Plot</b>		<b>Sub Tidal Plot</b>		<b>Scour Plot</b>	
<b>Sub Plot Type</b>	<b>ENR</b>	<b>ENR+AC</b>	<b>ENR</b>	<b>ENR+AC</b>	<b>ENR</b>	<b>ENR+AC</b>
Sub Plot Width (Feet)	100	100	52	52	145	150
Sub Plot Length(Feet)	221	221	466	466	150	150
Sub Plot Perimeter (Feet)	642	642	1035	1035	590	600
Sub-Plot Area (SF)	22,090	22,090	24,111	24,111	21,780	22,536
Average Thickness (FT)	0.75	0.75	0.75	0.75	0.75	0.75
Slope at edge of Plot (Assumed 1:4)	4	4	4	4	4	4
CY ENR per Sub Plot	649	649	727	727	638	659
Tons/CY (placed, in water, Estimated)	1.7	1.7	1.7	1.7	1.7	1.7
Tons Material per sub plot	1,110	1,110	1,240	1,240	1,090	1,130
Contingency (%)	5%	5%	5%	5%	5%	5%
<b>Tons Material per sub plot (including contingency)</b>	<b>1166</b>	<b>1166</b>	<b>1302</b>	<b>1302</b>	<b>1145</b>	<b>1187</b>

<b>AC Quantity</b>						
AC % (to be blended)	0%	4%	0%	4%	0%	4%
<b>AC (Tons) per sub-plot</b>	<b>0</b>	<b>47</b>	<b>0</b>	<b>52</b>	<b>0</b>	<b>47</b>

<b>ENR Material (Sand or Gravelly Sand)</b>						
% by weight	100%	96%	100%	96%	100%	96%
<b>ENR Material (Sand or Gravelly Sand) Tons</b>	<b>1,166</b>	<b>1,119</b>	<b>1,302</b>	<b>1,250</b>	<b>1,145</b>	<b>1,140</b>

- B. In addition to ENR and AC Material quantities listed above, Contractor shall supply an additional 141 tons of sand plus 4% AC (6 tons AC, 135 tons sand)) ENR material for in water test placement of sand plus AC ENR material.

### **PART 3 EXECUTION**

#### **3.01 ENR & ENR + AC PLACEMENT EQUIPMENT**

- A. A spud barge capable of holding equipment in place during placement operations while keeping spuds, anchors, chains, wires, etc. from contacting or disturbing areas where ENR or ENR+AC material has been placed shall be used for ENR & ENR+AC operations.
- B. The spud barge shall be equipped with a fixed arm excavator that meets the following criteria:

1. The contractor shall provide excavator that is less than 5 years old (Model year 2010 or newer) and have less than 5,000 operating hours, in good operating condition, and with no visible leaks. All hydraulic hoses and fitting shall be in new or like new condition to reduce potential for leaks.
  2. The contractor shall provide excavator that is capable of placing a full bucket at the extended reach and is capable of placing at least two bucket rows, measured from front of barge out, at full project depths (based on up to +8 MLLW tide) from a single spud setting.
  3. Navigation system as described in E below.
- C. Tug boat of appropriate size and draft capable of positioning the spud barge and material barge. Tug captain is to be aware of tide elevations, mudline elevations, and tug draft requirements. Tug shall not disturb the river bed with prop wash causing the underlying sediment to be suspended in the water column prior to or during ENR/AC placement or disturbing the ENR/AC after placement. Observations of turbidity resulting from tug boat operations shall require modification of operations by tug boat. Project Representative will observe operations of tugs in areas of test placement and plots and provide notice to contractor of any observed turbidity resulting from tug operations.
- D. Material shall be placed using sealed clamshell bucket (or alternate as approved by the Project Representative).
1. Clamshell (if used) shall be in good condition with overlapping side plates, relatively leak proof to extent practicable and necessary (based on visual observation by Project Representative before and throughout material placement. Bucket shall be properly vented to prevent loss of material during descent through the water column.
  2. Side plates and cutting edges shall be replaced as necessary to limit leakage.
  3. Volume of bucket and placement area achieved upon opening of bucket shall be known and adjusted as necessary to achieve an approximate 4.5 inch lift over as large of the bucket footprint area as practicable based on bucket characteristics such that when material is placed in two lifts, using an offset grid bucket pattern, an approximate 9 inch lift is achieved over the plot area as practicable. Contractor shall modify clamshell as appropriate for venting air from bucket and for adjusting placement thickness to meet project objectives. Such modifications may need to be done during the test placement operations. Contractor shall have all required materials, personnel and equipment onsite during test placement to make such modifications as necessary. Contractors work plan shall describe how they intend to initially attempt to meet project objectives and will modify equipment and factors such as bucket pattern to meet project objectives.
- E. The excavator shall be equipped with an Electronic Navigation and Positioning System capable of:
1. Accurately determining position of clamshell bucket (or similar) to +/- 4 inch accuracy in X, Y and Z axis, relative to project datum, in real time. Accuracy shall be verified at start and end of every shift, at a minimum.
  2. Bucket rotation/orientation.
  3. Bucket open/close position.
  4. Displaying project area and features, bathymetry, water level, barge and/or dredge or work platform location (to include spuds) and clamshell bucket (or similar) in both plan and cross section views in real time.

5. Accounting for any effects of river current on clamshell bucket position underwater compared to position of navigation equipment above water and displaying proper position in real time relative to project datum.
6. Record actual bucket opening location (X, Y and Z) and time for each bucket of material placed.
7. Electronic tide gauge shall be used to determine real time water surface elevation.

### **3.02 PLACEMENT METHOD DEMONSTRATION AND CALIBRATION**

- A. Prior to placement in subplots, Contractor shall demonstrate and verify intended placement method to demonstrate ability to meet specifications to Project Representative's satisfaction.
- B. Contractor shall test, calibrate and verify bucket volume, required fill factor, placement area and placement thickness by trial placement of the material in designated demonstration areas prior to placement in designated subplots.
  1. Contractor shall schedule placement demonstration to take place within one of the two timeframes (1) November 29<sup>th</sup>, 2016 through December 1<sup>st</sup>, 2016 or (2) December 12<sup>th</sup>, 2016 through December 16<sup>th</sup>, 2016.
  2. Contractor shall complete all necessary mobilization and equipment testing prior to any in water test placement. The placement demonstration shall be performed by the Contractor during the second high tide of the day in a minimum of 5 foot<sup>1</sup> water depth at the test placement area.
  3. Contractor Supervisory staff including Project Manager, Superintendent, Project Engineer and operator who performed placement shall be onsite to evaluate placement during low tide that occurs during night time hours on day that test placement was performed. Contractor shall provide suitable boat transportation to and from test placement area for night time field inspection including transportation of King Count, LDWG or agency representatives as necessary. Contractor shall provide suitable lighting for safe operations and inspection.
  4. Test placement shall occur only in the designated demonstration area and cover the demonstration area in its entirety as directed by the Project Representative
  5. Demonstration area shall have clearly marked breakaway grade stakes installed by King County so placement thickness may be verified. Grade stakes will be placed approximately 1 every 100 ft<sup>2</sup>. Contractor shall coordinate with King County for installation of grade stakes at test placement area.
  6. Contractor shall prepare demonstration ENR+AC material (both for Sand + AC and Sandy Gravel +AC) by filling water-tight (verified no leaks) barge with blended ENR + AC material to an appropriate depth, then filling the barge with water pumped from the Duwamish Waterway up to a level approximately 1-2 inches above the material. Material shall be soaked underwater for a minimum of 12 hours prior to demonstration.
  7. Within each test placement area Contractor shall place 2 lifts over approximately 75% of the test placement area and only one lift over approximately 25% of the test placement area such that the results of single lift placement and double lift placement can be evaluated and information used to adjust placement as necessary to meet project objectives. Within the test placement area located within the intertidal plot the area where only one lift is placed during

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<sup>1</sup> Except in higher elevation portions of intertidal plot where 5 foot water depth is not practicable due to limits of mean higher tide. Placement in such locations shall be done during periods of high tide as approved by Project Representative.

the Test Placement shall have a second lift placed as part of the placement within that sub plot.

8. The Contractor shall place the second lift such that the bucket is offset by one half the bucket's length and width from the first lift. Contractor shall work proactively with Project Representative throughout test placement to develop final placement pattern and methodology that is consistent with project objectives.
  - a. Contractor and Project Representative to inspect test placement for coverage, uniformity of placement, and minimum and maximum thicknesses. Project Representative will verify test placement thickness by reading grade stakes during the following low tide in the demonstration areas and approve thickness of placed material with thickness value of 6-9 inches at 80% of locations with no single location less than 4 inches in the area where two lifts were placed. Note that this low tide will occur during night time hours.
  - b. If required thicknesses are not achieved to satisfaction of Project Representative, Contractor shall adjust bucket grid pattern and/or bucket size or capacity as necessary to improve performance such that as large an area as practicable has a placement thickness of approximately 4.5 inches, with a second offset placement resulting in a total placement thickness of approximately 9 inches overall in a demonstration area designated by the Project Representative on the second high tide of the following day.
- C. Contractor shall assume 1 full day (10 hours) of demonstration placement and adjustment for each of two material types (Sand + AC and Sandy Gravel +AC) for a total of two demonstration days (actual demonstration placement, not including setup, barge or equipment movement, or preparation). Additional days may be necessary as determined by the Project Representative to develop procedure that meets project objectives.
- D. Water used to flood material barge may be discharged to the Duwamish Waterway after passing thru filter media of 1 micron (project representative to approve of filtration method and operation), provided that water quality exceedances do not result, as verified by Project Representative.

### **3.03 PLACEMENT METHOD**

- A. All floating equipment shall be positioned and spudded without disturbing Plot Areas beyond minimum necessary. Spuds shall not contact Plot areas once ENR or ENR+AC material has been placed within that Plot area.
- B. Contractor shall not disturb plots in any way once material has been placed.
- C. At any plot location, the Contractor shall place and complete the AC amended subplot first, prior to placing the NON-AC amended subplot.
  1. Pre-Soaked material (ENR+AC) shall be kept saturated during placement to extent practicable.
  2. ENR material without the amended AC shall be pre-soaked similar to AC amended material unless otherwise approved by the Project Representative.
  3. For ENR + AC material, clamshell (or similar) shall remove pre-soaked material from material barge and quickly lower bucket below the Duwamish Waterway surface to appropriate vertical position approximately 2 feet above river bed. Bucket shall not contact river bed at any time during placement. Material shall not be released from above the water surface or from higher than 2' above bed without approval by the Project Representative.

- a. If Project Representative approves use of non-pre-wetted ENR material, Contractor shall use clamshell (or similar) to remove dry material from material barge and lower bucket to just below the Duwamish Waterway surface; Contractor shall then pause the bucket so that it can saturate before lowering to appropriate vertical position approximately 2' above river bed. Bucket shall not contact bed at any time during placement.
- D. With bucket approximately 2 feet above river bed, and properly positioned horizontally over the intended target area, bucket shall be opened in a manner intended to produce as uniform a layer of material on the bottom as possible. Bucket shall be held in position and not swung during placement.
  - E. In order to avoid the use of spuds over areas where material has already been placed, the Contractor shall use the following grid pattern, unless otherwise approved by the Project Representative: start placement at the far end of the plot; start placement with farthest rows out from the excavator; complete two adjacent rows, then perform the second pass on the first row (consistent with the second pass grid pattern deemed acceptable during the Demonstration Placement); continue pattern until the closest row attainable by the excavator is reached; step or move material barge backwards (away from area just placed); repeat pattern.
  - F. Contractor shall not set spuds more than necessary to efficiently perform the work within any Plot. Contractor shall record locations of ALL spud set locations within plots and provide X, Y data file listing all spud set locations by subplot by date.
  - G. Adjacent buckets shall be placed with pre-determined overlap, as developed during demonstration placement procedure, intended to produce uniform 4.5 inch lift thickness to extent practicable.
    1. Material shall be placed using 2 lifts of approximately 4.5 inches each, with lifts offset in X & Y direction by  $\frac{1}{2}$  bucket dimension (Length or Width as appropriate) in each direction.
    2. During placement operations, operator shall use precise navigation system and real time display to place each clamshell bucket (or similar) within pre-planned grid area. Buckets shall be placed in sequential fashion.
    3. In areas of steeper slopes, material shall be placed starting from toe of slope and proceeding upslope to extent practicable, without setting spuds in areas where ENR material has already been placed.
    4. Navigation system shall display pre-programmed bucket placement locations for each bucket to be placed to guide operator during placement
    5. System shall record position (X, Y and Z) for each bucket of material placed to data file. Placed buckets shall be displayed on screen using separate colors for each lift as placed. Bucket placement files shall be provided to Project Representative daily.
    6. Operator visible data shall be telemetried in real time to Project Representative/Project Engineer office provided by Contractor on floating plant for Project Representative monitoring.
    7. During active placement operations bucket cycle times of 50 to 90 seconds are to be targeted, pending water quality impacts or other issues identified by the Project Representative. Cycle times exceeding 120 seconds will require action by Contractor to reduce cycle time as appropriate, potentially including replacement of operator, as requested by the Project Representative.

### **3.04 PLACEMENT VERIFICATION**

- A. Thickness of placed material will be verified after construction using breakaway grade stakes set by King County prior to ENR material placement by Contractor.
1. Prior to placement of ENR material in the waterway, King County will place grade stakes at 15 locations within each subplot, as shown on the Plans. Stakes will be installed to protrude 1.5 feet (18 inches) above existing grade at each location. Stakes will be clearly marked in 1 inch increments prior to installation and the reading at the mudline recorded at time of installation. Stakes will be installed with appropriate embedment length for sediment properties in order to resist overturning during placement of ENR material.
  2. Contractor shall then perform material placement as required, taking care to keep bucket a minimum of 2' above river bed bottom elevation at all times, using navigation system for guidance.
  3. Contractor shall complete 100% coverage of sub plot as observed by Project Representative and documented by navigation system and recorded bucket placement data file recorded by contractor and provided to Project Representative.
  4. Placement thickness and coverage will then be confirmed by Project Representative's diver's measurements of the grade stakes after material placement is completed, as directed by the Project Representative. Divers will record placed thickness as shown on each grade stake. Divers will also swim transects across Plot to visually verify coverage to extent practicable based on field conditions including visibility.
- B. Acceptance Criteria
1. The acceptance criteria for ENR or ENR+AC Material placement thickness and coverage are:
  2. Material placed within each sub-plot is weight equivalent to a 9 inch nominal layer for the area, based on scale tickets and/or barge draft during placement, as measured by the Project Representative, or as directed by the Project Representative.
  3. Placement thickness of 6-9 inches in 80% of stake locations per plot; and
  4. Placement minimum thickness of 4 inches at 100% of stake locations per plot.
  5. No placement that impedes navigation based on exceeding authorized channel depth within authorized navigation channel (i.e. if authorized channel depth is -30 MLLW, final placement within plot will be below elevation -30 MLLW).
  6. Acceptance criteria will be verified by King County divers from the reading of pre-placed grade stakes.
- C. If results of diver measurements, as evaluated by the Project Representative indicate areas that do not meet the minimum thickness criteria, Contractor shall work with Project Representative to determine where additional material shall be placed and how much material shall be placed.
1. Additional diver measurements would then be performed in area of additional material placement.
- D. Divers will also perform visual survey of general placement surface variation, coverage and roughness. Based on observations and discussions with Project Representative, divers may be directed to perform additional investigation in areas including diver probes or hand cores. If areas of thin placement (less than 4 inches) are noted, Project Representative will direct Contractor to place additional material as necessary.



- E. If Project Representative determines that over placement has occurred based on grade stakes or hydrographic surveys such over placement shall be addressed as described below in section 3.05 below.

### **3.05 OVERPLACEMENT**

- A. Contractor shall target placement of relatively uniform 9 inch layer over entire subplot area (placing volume equivalent to 9 inch layer). In the event that material is over placed to the extent that it interferes with navigation or presents a safety hazard, as determined solely by the Project Representative based on grade stakes or hydrographic surveys and known navigation requirements or other information, excess material shall be immediately relocated using the instrumented excavator and clamshell bucket. If over placement is due to Contractor error, relocation shall be at Contractors sole expense and shall be performed to satisfaction of Project representative
  - 1. Material relocated in this manner shall be relocated to the perimeter of the subplot and then placed as an enlargement of the subplot.
- B. In slope areas it is anticipated that some sloughing of the required materials may occur and that over placement near bottom of slope may result at no fault of Contractor.
- C. In areas of debris or significant grade changes it is anticipated that placement thicker than 1' may be necessary to achieve minimum thickness in adjacent area.

### **3.06 MULTI-BEAM HYDROGRAPHIC SURVEYS**

- A. Contractor shall perform multi-beam hydrographic surveys as described in Specifications Section 01050.
  - 1. Pre and post material placement surveys to be performed a minimum of 50' beyond each sub plot or test placement area unless access is restricted by docks, vessels, other hazards or navigable depth.
  - 2. Pre and post surveys will be used by the Project Representative to help evaluate placement thickness within each sub-plot or test placement area.
  - 3. Daily surveys of the day's placement area to help evaluate placement results, coverage, thickness and slope sloughage as practicable.
  - 4. As-built survey shall be performed of each sub Plot at completion of placement within that sub Plot.

### **3.07 WATER QUALITY MONITORING**

- A. Water Quality monitoring will be performed by King County per the EPA approved Water Quality Monitoring Plan referenced in Specification Section 01012.
- B. The Project Representative will monitor the Contractor's placement activities for compliance with the requirements of the Section 401 Water Quality Memo and other substantive requirements. Compliance will be measured and determined by the Project Representative.
- C. If water quality exceedances at any of the monitoring stations are noted, the Contractor will be required to adjust or modify its operations until compliance is achieved. This may include slowing of placement operations. In the event of a water quality exceedance as defined in the EPA issued 401 Water Quality Memo, Contractor may be required to cease work until water quality improves.

- D. The Contractor may be required to make modifications that include, but are not limited to, installation of silt curtains or debris booms.

**END OF SECTION**

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# **ATTACHMENT A**

## Outline for Contractors Work Plan

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## **Attachment A: Contractor Work Plan Outline**

- 1.0 Introduction
- 2.0 Contractor Organization
  - 2.1 Organization Chart
  - 2.2 Key Personnel - List of key personnel, their responsibilities, and supervisory chain and contact information (email and cell phone).
- 3.0 Safety
- 4.0 Approach Overview
  - 4.1 Work Sequence
  - 4.2 Schedule
  - 4.3 Layout
  - 4.4 Dock Location
  - 4.5 Project Office Location
- 5.0 Work Approach Narrative
  - 5.1 Mobilization
    - 5.1.1 Staging and Stockpile Area Location and Setup
    - 5.1.2 TESCOs for Stockpile Area
    - 5.1.3 Site Security
  - 5.2 Materials (ENR and ENR + AC)
    - 5.2.1 Source of ENR and AC Materials
    - 5.2.2 Source, Certifications, Gradation for AC
    - 5.2.3 Materials, methods, procedures and equipment to be used for ENR + AC blending, barge loading and transportation to Site
    - 5.2.4 Storage of ENR and ENR + AC to include protection of material against erosion bot on barge and prior to barge loading or other stockpiling
    - 5.2.5 Material Handling including ENR + AC soaking procedure
  - 5.3 Equipment Used for Placing ENR and ENR + AC Material
    - 5.3.1 Excavator- Description of excavator to include type, size, model, year, boom, stick, and column (if applicable) configuration, maximum depth below water line for bucket pattern full width of barge, into

placement rows. Tide limitations of excavator with proposed boom, stick, and bucket configuration.

- 5.3.2 Clamshell Bucket- Type, size, and manufacturer (or similar if other than clamshell is proposed by Contractor. Contractor may propose alternate to clamshell bucket for review and approval by Project Representative or designee). Detail any proposed or potential modifications to clamshell bucket to improve material placement.
- 5.3.3 Navigation and Positioning System – provide details on each component (Manufacturer, Model, Year, Accuracy, Location on Equipment, and resulting accuracy at clamshell bucket. Include Manufacturers specification sheet for each piece of navigation system.
- 5.3.4 ENR and ENR + AC Material Barges – Details on ENR and ENR + AC barge size, load table, type, configuration, bin depth, capacity, draft (empty and loaded).
- 5.3.5 Barge Water Handling Equipment – Description of equipment all used (to include valves, piping/hoses, bag filters, pumps, etc.) for pumping of saline water. Documentation or calculations to demonstrate that system is capable of 800 gpm flowrate during use.
- 5.3.6 Spud Barge for excavator – description of spud barge on which excavator will be operated from, including barge dimensions (L, W, D), draft (when loaded and ready to perform placement operations).
- 5.3.7 Tugs - details on tug size, draft, drive type, horsepower.
- 5.4 Methods and Procedures to be during ENR and ENR + AC Placement
  - 5.4.1 Description of how ENR + AC material will be blended, loaded, handled, pre-soaked in barge and then placed to achieve project objectives.
  - 5.4.2 Detailed description of how demonstration placement will be performed and how placement will be adjusted during demonstration to achieve project objectives.
  - 5.4.3 Placement grid – initial grid and fill factor based on bucket footprint and target 4.5” lift thickness which will then be tested during placement test and adjusted prior to placement of additional material within the Duwamish Waterway beyond limits of test plot areas. Contractor to provide details on proposed bucket, why selected, anticipated coverage footprint and related fill factor intended to meet project objectives.
  - 5.4.4 Order in which the work is to be performed, indicating the work sequence; number, types, and capacity of equipment to be used;

hours of operation; methods of operation; and the time required to complete each activity (based on each subplot).

- 5.4.5 Methods, procedures, and equipment for environmental protection and monitoring, including procedures for emergency spill containment and removal operations.
  - 5.4.6 Contingency actions that will be used in the event that ENR or ENR + AC placement causes water quality exceedances.
  - 5.4.7 Notification and procedures to be used for moving ENR & ENR + AC materials and equipment to accommodate commercial vessel traffic using the waterway. Operations will be coordinated and scheduled to reduce interference with this traffic and work within scheduled daily bridge closure windows.
- 5.5 Hydrographic Survey
    - 5.5.1 Methods
    - 5.5.2 Procedures (Survey and Quality Control)
    - 5.5.3 Equipment used (Manufacturer, Model, Year, Frequency (if applicable), and Transducer Type (if applicable)).
    - 5.5.4 Anticipated survey schedule
  - 5.6 Refueling procedures both on and off water
  - 5.7 Noise control and response to noise complaints



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**SECTION 408 MEMORANDUM**

Substantive Compliance Memorandum  
for Placement of Subtidal Pilot Plot in the Federal Navigation Channel

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REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
CORPS OF ENGINEERS, SEATTLE DISTRICT  
P.O. BOX 3755  
SEATTLE, WASHINGTON 98124-3755

October 21, 2015

Ms. Ellen Hale  
Environmental Protection Agency, Region 10  
1200 Sixth Avenue  
Suite 900, MS ECL-122  
Seattle, WA 98101

Dear Ms. Hale:

The Seattle District, U.S. Army Corps of Engineers (District) conducted an agency technical review of the proposed alteration to the Lower Duwamish Waterway – Seattle Harbor Federal Navigation Project. The review ensured substantive compliance with 33 CFR 408 (Section 408) and excluded the procedural requirements of the policy. Per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 USC 9621(e)(1), a permit from the Corps under Section 408 is not required for the proposed action to alter the authorized Federal navigation project. Therefore, this letter serves as notice that the District has completed a technical review and determined the proposed project is in compliance with the substantive requirements of Section 408.

The District's technical review included the proposed Lower Duwamish Waterway Enhanced Natural Recovery and Activated Carbon Pilot Study's potential to adversely impact: 1) the authorized purpose of the Federal navigation channel; 2) the District's ability to operate and maintain the project; and, 3) public interest. Based upon the District's technical review, the District determined that the designs and analyses provided for review are adequate, and that the proposed alteration will not have adverse impacts to the function of the authorized Federal navigation project, will not impair the usefulness of the authorized Federal navigation project, and will not be injurious to the public interest.

The District further notes the following responsibilities and clarifying actions as this Pilot Study moves forward toward construction and into the final remedial actions:

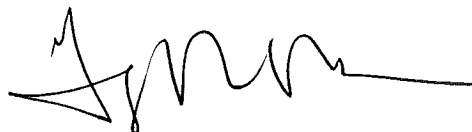
- The District requires the grade stakes to be made of a flexible material such as thin walled PVC, which will deform if impacted by a vessel. The District further requests the Environmental Protection Agency (EPA) to coordinate location of grade stakes with the local Coast Guard station to ensure mariners are aware of their presence in the channel. Grade stakes should be clearly marked and removed at the end of the Pilot Study.
- The District will require all final designs to be coordinated with the District staff prior to construction.

- All final as-builts will be required to be turned over to the Seattle District Navigation Program Manager, Elizabeth Chien, who can be reached at (206) 316-3968 and via email at Elizabeth.A.Chien@usace.army.mil.
- EPA and the Lower Duwamish Waterway Group (LDWG) are responsible for all O&M and Monitoring activities for the proposed Pilot Study. The District and the Port of Seattle will remain responsible for all operations and maintenance activities of the Lower Duwamish Waterway navigation project.
- The District will require that LDWG and EPA keep the District aware of construction schedule and efforts. Please contact Elizabeth Chien, Navigation Program Manager, at (206) 316-3968 or Elizabeth.A.Chien@usace.army.mil to coordinate prior to and during construction.
- The District notes that any dredging maintenance activities conducted by the District could remove portions of the clean Enhanced Natural Recovery (ENR) and ENR+Activated Carbon layer placed in the sub-tidal plot within the boundaries of the Federal navigation channel. The District will not be responsible for replacing any of the removed materials.
- This Section 408 ATR is only to support the Pilot Study. The review conducted does not preclude any future Section 408 technical reviews and does not automatically grant future permissions or compliance determinations to support the Superfund project.
- No Regulatory Permit actions under the direct authority of the Corps of Engineers were required to support the proposed alteration.

This determination reflects the information available at the time of review of the LDWG's submittal, *U.S. Army Corps of Engineers – Section 408 Substantive Compliance Memorandum for Placement of Sub-tidal Pilot Plot in the Federal Navigation Channel* dated September 23, 2015. Enclosed is the District's Finding of Summary developed by the District's agency review team. Consequently, should the proposed project be modified prior to implementation, the LDWG and EPA should advise the District of any alterations and allow the District an opportunity to review further.

Should you have any questions regarding this evaluation and action, please contact Keely Brown, Section 408 Coordinator, at email keely.n.brown@usace.army.mil or (206) 764-3434.

Sincerely,



for

Frances E. Coffey, P.E, PMP  
Chief, Operations Division  
Seattle District

Encl



**DEPARTMENT OF THE ARMY**  
**CORPS OF ENGINEERS, SEATTLE DISTRICT**  
P.O. BOX 3755  
SEATTLE, WASHINGTON 98124-3755

REPLY TO  
ATTENTION OF

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MEMORANDUM FOR RECORD

SUBJECT: Summary of Findings - Lower Duwamish Waterway Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

**1. References.**

- a. EC 1165-2-216, 31 July 2014, Policy and Procedural Guidance for Processing Requests To Alter US Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408.

**2. Overview of Summary of Findings and Conclusions For Recommending Approval.**

This Summary of Findings documents the U.S. Army Corps of Engineers (NWS) agency technical review (ATR) of the alteration or temporary occupation of the NWS completed project, Lower Duwamish Waterway –Seattle Harbor Navigation Project and the proposed alteration’s compliance with the substantive requirements of 33 USC 408 (Section 408). In accordance with reference 1a, NWS conducted its ATR to determine whether the proposed project – Lower Duwamish Waterway (LDW) Enhanced Natural Recovery and Activated Carbon (ENR+AC) Pilot Study Project (Pilot Study) is not injurious to the public interest or affects the Federal project’s ability to meet its authorized purpose. The review ensured substantive compliance with reference 1a, and excluded the procedural requirements identified in reference 1a such as public notices to accept funding, implementation of memorandum of agreements, and NEPA compliance. As a Federal agency, the Environmental Protection Agency (EPA) ensured environmental compliance for the Pilot Study.

Based upon the technical reviews, NWS has determined that the proposed alteration to the Federal navigation channel will meet U.S. Army Corps of Engineers (USACE) engineering and safety standards and will not have significant adverse affects on the function of the LDW Federal navigation channel and its authorized purpose. The design of the proposed modifications is adequate, technically feasible, not injurious to the public, and will not impair the usefulness of Federal navigation project.

**3. Substantive Requirements for CERCLA Projects.**

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9621(e)(1) states that, “no Federal, state, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section”. Further, implementing regulation for EPA’s hazardous substance response at 40 CFR

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SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

300.400(e) provides, "permit requirements. (1) No Federal, state, or local permits are required for on-site response actions conducted pursuant to CERCLA sections 104, 106, 120, 121, or 122. The term on-site means the area extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action."

NWS and the Northwestern Division Office of Counsel advised that a Section 408 permit or permission is not required for the LDW Superfund Project. Section 408 provides the authority for the Chief of Engineers to grant permission for the alteration or permanent occupation or use of any USACE completed works when in the judgment of the Secretary such occupation or use will not be injurious to the public interest and will not impair the usefulness of such work. Therefore, the Section 408 "permission" is the type of procedural requirement that 40 USC 9621(e) envisioned as not being required for Superfund actions.

Although 40 USC 9621(e) waives purely procedural requirements for CERCLA removal and remedial actions, substantive compliance with applicable regulations is required. Per OSWER Directive 9355.7-03, Lower Duwamish Waterway Group (LDWG) and EPA are required to consult and coordinate with NWS to ensure compliance with the substantive requirements of Section 408 guidance, EC 1165-2-216. In particular, the work should not result in increased Operations and Maintenance (O&M) costs to the Corps, nor should it change the dimensions of the authorized Federal navigation project, and not be injurious to the public interest. As a part of the appropriate consultation and coordination approach of EPA's substantive review, NWS conducted an agency technical review to ensure the proposed alteration does not injure the public interest or affect the ability of the project to meet its authorized purpose per EC 1165-2-216.

Therefore, the agency technical review was not conducted to grant a permit or permission action; rather, it was conducted as a part of EPA's coordination and consultation efforts to comply with the substantive requirements of Section 408. EPA was requested to fund the review as a part of our Superfund support through an existing Interagency Agreement.

Overall, the purpose of the Section 408 review ensures that the proposed modification does not adversely impact 1) the ability of the project to meet its authorized purpose, 2) the usefulness of the project, 3) public interest, 4) demonstrates legal compliance, and 5) meets the requirements as set forth in EC 1165-2-216. This review further ensures substantive compliance and does not require the development of any NEPA documents or public notices or require a formal Section 408 approval by the NWS District Commander. However, NWS will send a notice of Section 408 substantive compliance to the EPA to implement the proposed project. The notice will also document that the review was completed and identify clarifying actions as the proposed project is implemented.

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SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

#### **4. Section 408 Submittal Document**

EPA submitted a Section 408 Memorandum dated 29 July 2015, requesting a technical evaluation of the Section 408 substantive requirements to alter the Lower Duwamish Waterway – Seattle Harbor Federal Navigation Channel Project. The Section 408 Memorandum addresses the substantive compliance of the construction of the Pilot Study plot. The Pilot Study is being performed by the Lower Duwamish Waterway Group (LDWG) per the Second Amendment to the Administrative Order on Consent For Remedial Investigation / Feasibility Study (AOC) for the LDW, CERCLA Docket No. 10-2001-0055, issued on 20 December 2000. The request accompanied 65% designs and analyses of the proposed alteration. EPA revised the Section 408 Memorandum on 23 September 2015 in response to NWS's ATR Comments (**Enclosure 1**). The LDWG consists of the City of Seattle, King County, Port of Seattle, and the Boeing Company.

**Summary of Proposed Project Alteration** - The proposed alteration supports the construction of an Enhanced Natural Recovery and Activated Carbon Pilot Study Plot. The Pilot Study will evaluate the effectiveness of Enhanced Natural Recovery and Activated Carbon (ENR+AC) compared to Enhanced Natural Recovery (ENR) alone as a remedial sediment cleanup action in three areas of the LDW in which sediments are contaminated with polychlorinated biphenyls (PCBs); they are designated as the intertidal, subtidal, and scour plots. Only the subtidal plot is within the navigation channel and subject to Section 408 substantive compliance. In each plot, two adjacent, half-acre areas will be evaluated, one in which only ENR material has been placed and the other in which ENR material amended with activated carbon has been placed. The ENR material in the subtidal plot will consist of clean sand. In all three plots, the ENR+AC material will also contain granular activated carbon.

The proposed project further includes pre-and post- implementation monitoring. Pre-and post- implementation monitoring of the three pilot plots will be conducted to assess baseline conditions prior to project activities and to periodically evaluate conditions of the three pilot plots after placement of the ENR and ENR+AC materials. Monitoring activities include bathymetric survey, sediment sampling, and benthic recolonization assessment.

**Site History** – The Lower Duwamish Waterway Superfund Site is a 5 mile stretch of the Duwamish River that flows into Elliot Bay in Seattle, Washington. The Waterway is flanked by industrial corridors, as well as the South Park and Georgetown neighborhoods. The site was added to EPA's National Priorities List in 2001.

A century of heavy industrial use has left the waterway contaminated with toxic chemicals from many sources – industries along its banks, stormwater pipes, and runoff from upland activities, streets and roads. Pollution in the river sediments includes PCBs, dioxins/furans, carcinogenic polycyclic aromatic hydrocarbons, and arsenic. Many of these chemicals stay in the environment for a long time, and have built up to unsafe levels in resident fish and shellfish. The EPA and the Washington Department



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SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

of Ecology are working to clean up contaminated sediment and control sources of additional contamination in the waterway.

**5. Physical and function description of the existing project.** The LDW is a Federal navigation channel, authorized under the River and Harbor Act of 1919 and modified by subsequent Acts. As such, it performs functions that must not be adversely affected by other actions. The USACE is responsible for maintaining the navigation channel to the following authorized depths and widths:

- -30 feet mean lower low water (MLLW) and 200 feet wide from Harbor Island (River Mile (RM) 0.0) to the First Avenue South Bridge (RM 2.0), also known as the Harbor Island and Georgetown reaches.
- -20 feet MLLW and 150 feet wide from the First Avenue South Bridge (RM 2.0) to Slip 4 (RM 2.8), also known as the First Avenue South Reach.
- -15 feet MLLW and 150 feet wide from Slip 4 (RM 2.8) to the Upper Turning Basin (RM 4.7), also known as the South Park and 14<sup>th</sup> Avenue Bridge Reaches. The authorized dimensions of the navigation channel portion of the Upper Turning Basin are 250 feet wide by 500 feet long.

USACE conducts maintenance dredging every 1 to 3 years in the upstream areas. The area typically dredged under this program is the Upper Turning Basin and downstream to approximately RM 4.0. Dredging shoaled material from the Upper Turning Basin minimizes the need for maintenance dredging in the lower portion of the LDW. The navigation channel downstream of RM 3.35 has not been subjected to maintenance dredging since 1984, and that was only for a small portion of the navigation channel near Kellogg Island.

**6. Project Authorizations.**

The Rivers and Harbors Act of 2 March 1919, 65 Pub Law 323; 40 Stat 1275, authorized the dredging and maintenance of the Seattle Harbor Navigation Project, modified by subsequent Acts. The Project provides for dredging of the Duwamish Waterway – 200 feet wide and 30 feet deep between First and Eighth Avenue South with a turning basin 600 by 350 feet and 20 feet deep south a the First Avenue bridge, 150 feet wide by 15 feet deep to a point about 1.4 miles above Fourteenth Avenue South Bridge, with a turning basin 500 by 250 feet and 15 feet deep, and a settling basin with capacity of about 100,000 cubic yards at the upper end of the waterway. The total length of the improvement in Duwamish Waterway is 5.112 miles and of all waterways included in the Seattle Harbor, about 7.5 miles. All depths refer to the plane of mean lower low water.

The project was completed in 1931, except for the settling basin, the turning basin south of the First Avenue Bridge, and East Waterway above the 750-foot section, which was deauthorized in 1986.

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SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

## **7. Impact to the Usefulness of the USACE Project and Public Interest**

### **Determination.**

The NWS ATR Team conducted a substantive review of the proposed alteration submittal comprised of technical analyses and 65% designs to determine technical adequacy of the designs and to ensure the project was not injurious to the public. The ATR was completed between August 13 and August 20, 2015. The ATR determined that the proposed alterations to the completed Federal navigation channel are technically feasible, will not be injurious to the public interest, and will not impair the usefulness of such Federal facilities. The ATR comments are documented in **NWS ATR Comments (Enclosure 2)**.

The design of the pilot study was prepared by a group of expert scientist and engineers using standard scientific and engineering practices. The Pilot Study was designed to place the minimum amount of ENR and ENR+AC to meet the goals of the project and considered the placement precision of various types of equipment that may be used during the construction. Prior to implementation the design will require approval by the Washington State Department of Ecology and EPA.

The District's engineering review details the following:

### **Placing ENR and ENR+AC Material within an Authorized Navigation Channel**

EC 1165-2-216 recommends that project specific setbacks be used as the preliminary evaluation criteria to determine if a project is likely to impact the usefulness of the Federal navigation projects or be injurious to the public interested under Section 408. For this project an acceptable setback distance would be equivalent to the overdredge allowance of 2 ft below the authorized depth. The authorized depth in the vicinity of the proposed project is -30 ft MLLW so the corresponding overdredge/setback depth would be -32 ft MLLW. Anything shallower than -32 ft MLLW could have the potential to impact the usefulness of the project.

Figure 1 shows a typical section of the channel within the proposed project footprint looking downstream. Based on the most recent (May 2015) surveys there are no areas within the proposed project footprint that are shallower than -30 ft MLLW. There are some areas within the overdredge allowance depth indicating a general trend of sediment deposition within the channel. The right (east) side of the channel which is outside of the proposed project footprint does contain some areas shallower -30 ft within the navigation channel.

For analysis purposes the worst case assumption of a uniform 12" thick ENR and ENR+AC layer was assumed. Under this scenario the proposed project will place ENR and ENR+AC layer within the established setback area and would result in a small (400 FT<sup>2</sup>) area shallower than the authorized depth of -30 ft. This area in general would only be shallower than -30 ft by less than 6 inches with shallowest depth of -29.6 ft MLLW.

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SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

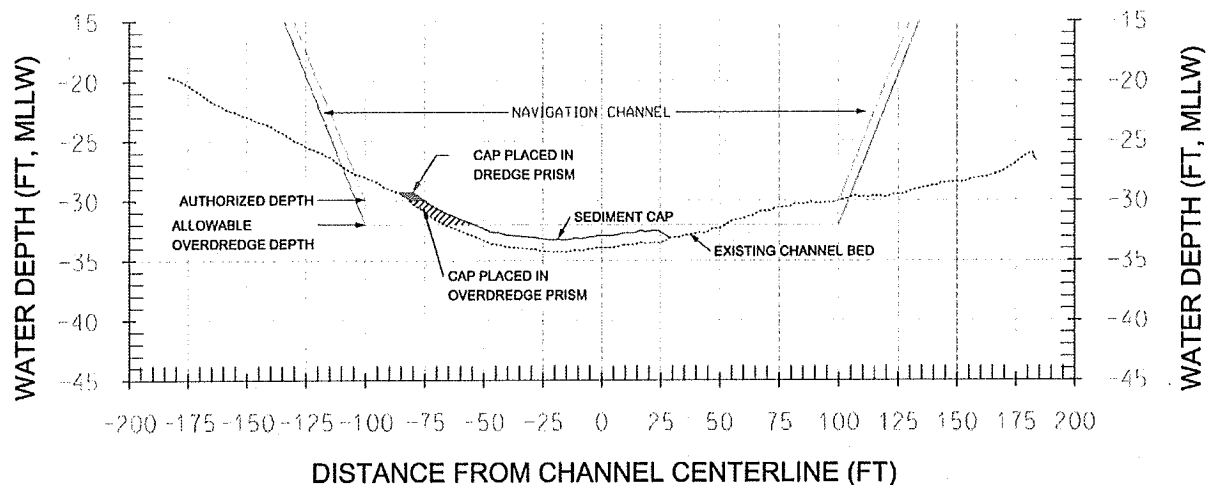


Figure 1: Typical Section of Navigation Channel in Proposed Project Footprint (Looking Downriver)

### Vessel Usage

As stated in the Section 408 Memorandum the use of this portion of the channel by vessels with drafts of 30 ft is infrequent and episodic. Typically vessels with drafts in this range will transit the channel at a high tide to ensure sufficient under keel clearance. The vessels will then spend the majority of their time outside of the navigation channel in a deeper berthing area while they are loaded/unloaded. Once loading/unloading is complete the vessels will wait for high tide to again transit the channel out to deep water. The placement of the ENR and ENR+AC layer is not likely to affect vessel movement within the channel assuming vessels maintain their current method of operations.

### Maintenance Dredging

As stated in the Section 408 Memorandum this portion of the channel has not been dredged in more than 30 years and there are no immediate plans to dredge this portion of the channel. It is well known that the sediment in this part of the channel does not meet open-water disposal standards and would require special dredging techniques and upland disposal. At this point in time the small areas which are shallower than the authorized depth do not have a significant enough impact on navigation in the channel to justify the cost of dredging. The additional 400 ft<sup>2</sup> of channel which could become shallower than the authorized depth is not likely to change this determination.

The proposed ENR and ENR+AC layer consists of sand which can easily be dredged, if dredging were found to be necessary in the future. If dredging was found to be necessary in the future, and subsequently the effectiveness of the ENR and ENR+AC layer was compromised, the Performing Parties that implement the remedy (in this case the ENR and ENR+AC layer) would be responsible for any needed repairs. Based on the above discussion the ENR and ENR+AC layer placement is not expected to affect the USACE O&M of the Federal navigation channel.

**Grade Stakes**

One of the methods proposed for measuring the ENR and ENR+AC layer thickness is the installation of Grade Stakes protruding 1.5 ft above the existing surface into the authorized channel. These may impact the usefulness of the channel by effectively reducing the navigational depth in the areas they are installed. These stakes will need to be made of a flexible material such as a thin walled pvc so they can deform if impacted by a vessel. These will also need to be coordinated with the local Coast Guard station to ensure mariners are aware of their presence in the channel. As long as these stakes are clearly marked and removed at the end of the pilot project they should not affect the usefulness of the navigation channel.

**Public Interest Determination**

Whether the proposed project is injurious to the public interest is determined by balancing the project's foreseeable benefits and detriments. Many of the factors usually considered in the public interest determination, such as historic properties, recreation, flood risk, etc, are not applicable in this circumstance since the project will occur entirely on the submerged river bottom and will have little effect on the surrounding area. The foreseeable benefits of the project include accelerated remediation of contaminated aquatic sediments in the Lower Duwamish Waterway and scientific data on the efficacy of the use of activated carbon in enhanced natural recovery methods. The potential detriments of the project include the potential effects to navigation discussed above, temporary increases in water turbidity during material placement, and temporary disruption of the benthic community in the placement area. Effects to navigation have been determined to be minor and are not expected to impair the function of the federal navigation project. Potential detrimental environmental effects are likewise minor, and are outweighed by the potential environmental benefits of accelerated remediation. The increase in scientific knowledge that will result from the project will be a benefit to the public. Considering all these factors, it has been determined that the proposed project will be a net benefit to the public and is not injurious to the public interest.

**8. Agency Technical Review Team**

The technical review was 100% funded by EPA as a part of the Superfund Support project. Other than providing guidance to the Port, the NWS engineering and operations team participated only in a review capacity for the designs and analyses.

NWS technical review team included the following disciplines:

Technical Team Member	Technical Review
Keely Brown, PM and Planner	Reviewed the document to ensure consistency with USACE policy for modification of completed USACE projects.
Kristen Kerns, Physical Scientist	Review included ensuring design adequacy to support handling, removal, and monitoring of contaminated materials, assessment of potential impacts to the Federal project, and ensuring the proposed project was consistent with USACE design standards.

<p>Scott Brown, Coastal Engineer</p>	<p>Review included ensuring that the hydraulic effectiveness of the navigation project was not compromised, no adverse impacts to the floodplain, and that the designs support USACE hydraulic design standards.</p>
<p>Doris Cope, Realty Specialist</p>	<p>Reviewed the proposed project scope to determine minimum real estate interest required to support the modifications.</p>
<p>Elizabeth Chien, Navigation Project Manager</p>	<p>Review included ensuring the proposed modifications does not impact the operations of LWSC and that the mitigation proposed is supportive of the recreational features and environmental habitat of LWSC.</p>

**9. Policy Compliance Certification.**

All policy and technical issues have been addressed and resolved through the ATR and its certification. An ATR certification ensures appropriate quality control and assurance has been conducted for the project and confirms that the proposed alteration and technical review is consistent with policy and is adequate to support the type of alteration and project complexity (**Enclosure 3**).

**10. Certification of Legal Sufficiency from NWS Office of Counsel.**

A legal review was conducted to ensure legal sufficiency of the proposed alteration and the review. All legal concerns have been resolved and are based upon conditions as stated in the letter of permission signed by the NWS District Commander. The ATR Certification depicts the legal sufficiency of the proposed alteration (**Enclosure 3**).

**11. Certification by the Chief of the NWS Real Estate Division that the real estate documentation is adequate.**

A real estate analysis was conducted to ensure minimum real estate interests per the proposed project scope. The Washington Department of Natural Resources issued a letter dated April 27, 2015, granting the proponents access to the aquatic lands (**Enclosure 4**) for project implementation. Since the proposed project will not interfere with vessel traffic or future O&M dredging, no additional real estate is necessary to ensure continued use, operation or maintenance of the existing Federal navigation project. The Chief of Real Estate’s certification is enclosed (**Enclosure 3**).

**12. A description of any related, ongoing USACE studies, including how the proposed alteration may impact those studies.**

- Seattle Harbor Deep Draft Navigation General Investigation**  
 The Corps and Port of Seattle initiated a Feasibility Study evaluating navigation improvements to Seattle Harbor’s East and West Waterways. The on-going Deep Draft Navigation Feasibility Study does not include improvements to the Lower Duwamish Waterway portion of the Seattle Harbor Navigation Project.

CENWS-EN

SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

- **Seattle Harbor O&M Projects**

NWS will conduct maintenance dredging within the Lower Duwamish Waterway during the months of December 2015 and January 2016. The dredging will not occur within the same project areas as the proposed alteration and therefore will not impact the proposed alteration.

**13. Summary of any changes to the O&M manual. If NWS has determined that USACE would assume O&M responsibilities as part of its responsibilities for the USACE project, include the rationale and any anticipated increase in USACE O&M costs.**

The proposed project will not increase or require additional O&M responsibilities on behalf of NWS. The placement of the ENR and ENR+AC layer in the subtidal plot will not impact NWS's ability to maintain the authorized navigation channel. As with all ENR areas identified in EPA's LDW Record of Decision, if future disturbances to the ENR areas including disturbances created by maintenance dredging, impact the effectiveness of the remedy, the Performing Parties that implement the remedy will be responsible for any needed repairs.

The letter signed by the NWS District Commander to the EPA and LDWG will incorporate the requirements for O&M to be the responsibility of the LDWG and the EPA.

**14. Summary of any changes to a project partnership agreement (PPA) or local cooperation agreement (LPA), if applicable;**

There is no existing PPA or LPA for the existing Federal navigation project; therefore, there are no applicable revisions required.

**15. Applicable environmental compliance documentation including but not limited to NEPA documentation, Endangered Species Act documentation, and other necessary documentation.**

Environmental compliance review and consultation for the proposed modification has been conducted by EPA. The CERCLA process is considered to be functionally equivalent to the NEPA process. Documentation of this process can be found in EPA's Record of Decision published in November 2014. No additional NEPA process is required for this substantive compliance review, as based upon 42 USC 9621(e) no Corps permit is required.

EPA prepared a biological evaluation (BE) for the Pilot Study for Section 7 consultation under the Endangered Species Act. The Pilot Study is not expected to substantially alter existing environmental conditions within the LDW. A number of environmental impacts were identified and EPA has identified the appropriate conservation measures and BMPs to minimize and avoid impacts on listed species and the environment during in-water work.

**16. Finding of No Significant Impact or Record of Decision**

As previously discussed, 40 USC 9621(e) waives the requirement to perform a formal NEPA evaluation. The substantive equivalent of NEPA documentation, including the FONSI, is contained in EPA's Record of Decision published in November 2014.

**17. Summary of the acceptance and use of funds pursuant to Section 214**

This review was not conducted to grant a permit or permission action; therefore, funds were not requested under WRDA 214 for the agency technical review. The agency technical review was conducted as a part of EPA's coordination and consultation efforts to comply with the substantive requirements of the project. EPA provided 100% of the funds to our Superfund Support through an existing interagency agreement in order for NWS to do this Section 408 substantive review.

**18. Any additional Final Conclusions or information, including any associated controversial issues.**

Based on the technical review of the design drawings and supporting documentation, NWS has determined that the proposed modifications to the Federal navigation channel are technically adequate and not an impairment to the usefulness of the existing Federal project. The proposed project is in accordance with environmental statutes; is without significant adverse hydraulic impacts; and is not injurious to the public interest.

NWS also notes the following responsibilities and clarifying actions as this Pilot Study moves forward toward construction and into the final remedial actions:

- NWS requires the grade stakes to be made of a flexible material such as thin walled PVC, which will deform if impacted by a vessel. NWS further requests EPA to coordinate location of grade stakes with the local Coast Guard station to ensure mariners are aware of their presence in the channel. Grade stakes should be clearly marked and removed at the end of the Pilot Study.
- NWS will require all final designs to be coordinated with the NWS Operations Support Branch prior to construction.
- All final As-Builts will be required to be turned over to the NWS Operations Support Branch.
- EPA and the Lower Duwamish Waterway Group are responsible for all O&M and Monitoring activities for the proposed Pilot Study.
- NWS will require that LDWG and EPA keep NWS aware of construction efforts.
- NWS notes that any dredging maintenance activities conducted by NWS could remove portions of the clean ENR and ENR and AC layer placed in the subtidal plot within the boundaries of the navigation channel.
- This Section 408 ATR is only to support the Pilot Study. The review conducted does not preclude any future Section 408 technical reviews and does not automatically grant future permissions to support the Superfund project.

CENWS-EN

SUBJECT: Summary of Findings - Lower Duwamish Way Enhanced Natural Recovery and Activated Carbon Pilot Study Substantive Compliance Section 408 Review

- No Regulatory Permit actions were required to support the proposed alteration.

**19. Final Recommendation.**

Pursuant to 33 USC 408, NWS has sufficiently and adequately conducted an Agency Technical Review to the proposed alterations to the Lower Duwamish Waterway – Seattle Harbor Navigation Project. The technical review is commensurate to the level of risk and complexity inherent in the proposed project, as well as the project phase indicated. The technical review was also conducted to comply with the substantive requirements of EC 1165-2-216. Upon considering the engineering, environmental, real estate, and legal aspects of the proposed alterations, as described herein, it has been determined that the Lower Duwamish Waterway Enhanced Natural Recovery and Activated Carbon Pilot Study is not injurious to the public interest and does not impair the usefulness of the authorized project.

This recommendation reflects the information available and USACE policies at the time of review. Consequently, should the proposed project be modified prior to implementation, the Lower Duwamish Waterway Group and EPA should advise NWS of any modifications and allow NWS an opportunity to review further.



JOANN T. WALLS, P.E  
Chief, Engineering Division

21 Oct 2015  
Date

Encls

Enclosure 1: Substantive Compliance Section 408 Memorandum

Enclosure 2: NWS ATR Comments

Enclosure 3: ATR Certification

Enclosure 4: DNR Letter



**ENCLOSURE 1**

**LDW ENR+AC PILOT STUDY SECTION 408 MEMORANDUM**

# Lower Duwamish Waterway Group

*Port of Seattle / City of Seattle / King County / The Boeing Company*

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## Memorandum

**To:** Lower Duwamish Waterway Group

**From:** Amec Foster Wheeler Environment & Infrastructure, Inc.  
Dalton, Olmstead & Fuglevand, Inc.  
Ramboll Environ  
Floyd|Snider  
Geosyntec Consultants

**Date:** September 23, 2015

**Subject:** **U.S. Army Corps of Engineers – Section 408 Substantive Compliance Memorandum for Placement of Subtidal Pilot Plot in the Federal Navigation Channel**

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This memorandum is intended to evaluate substantive compliance per requirements of 33 USC § 408 (Section 408) for the construction of an Enhanced Natural Recovery/Activated Carbon pilot study plot. This memorandum was generated using Engineering Circular guidance (EC 1165-2-216) as per the U.S. Army Corps of Engineers (USACE) request. The pilot study is being performed by the Lower Duwamish Waterway Group (LDWG) per the Second Amendment (July 2014) to the Administrative Order on Consent (Order) for Remedial Investigation/Feasibility Study for the Lower Duwamish Waterway (Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 10-2001-0055, issued on December 20, 2000).

Because the intertidal and scour plot areas are not located within the federal navigation channel, this memorandum will only address potential effects of the subtidal plot (Figure 1) as per requirements of 33 USC § 408 (Section 408).

The memorandum consists of the following sections:

- Section 1.0 – Project Description and the LDW Federal Navigation Channel.
- Section 2.0 – Analysis of Federal Navigation Function.
- Section 3.0 – Technical Analysis and Adequacy of Design.
- Section 4.0 – Real Estate Analysis.
- Section 5.0 – Environmental Risk.
- Section 6.0 – Floodplain Management Considerations.
- Section 7.0 – Residual Risk Analysis.

- Section 8.0 – Impacts to Corps of Engineers Operations and Maintenance.
- Section 9.0 – Summary and Conclusions.
- Section 10.0 – References.

## 1.0 PROJECT DESCRIPTION AND THE LDW FEDERAL NAVIGATION CHANNEL

This section provides brief descriptions of the pilot plot study and the Lower Duwamish Waterway (LDW) federal navigation channel. The complete Draft Design Package for the pilot study was provided to EPA on July 22, 2015.

### 1.1 PILOT PLOT STUDY

This section provides a description of the pilot study, including the active placement of the ENR and ENR+AC materials, as well as pre- and post-implementation monitoring of the pilot plots.

The pilot study will evaluate the effectiveness of ENR+AC compared to ENR alone as a remedial sediment cleanup action in three areas of the LDW in which sediments are contaminated with polychlorinated biphenyls (PCBs); they are designated as the intertidal, subtidal, and scour plots. In each plot, two adjacent, half-acre areas will be evaluated, one in which only ENR material has been placed and the other in which ENR material amended with AC has been placed. The ENR material in the subtidal plot will consist of clean sand. In all three plots, the ENR+AC material will also contain granular AC at a concentration of 1 to 3 percent. The proposed AC concentration is sufficient to sequester PCBs (and to reduce bioavailability) but is not expected to adversely affect benthic biota.

Conservation measures and best management practices (BMPs) for the construction of the pilot study are described in Section 5.0.

#### 1.1.1 Construction Elements

It is anticipated that a barge-mounted fixed-arm excavator with a clamshell bucket will be used for submerged placement of the ENR and ENR+AC materials. The submerged release of the ENR and ENR+AC materials a few feet above the substrate will minimize the loss of AC as the ENR+AC material descends through the water column and will also minimize turbidity plumes that may result as fine particles in the ENR and ENR+AC materials become suspended in the water column and descend to the bottom substrate. The ENR+AC material will be preblended to meet the target concentration of AC and presoaked prior to placement. Presoaking of the ENR+AC material will help to minimize the loss of AC as the ENR+AC material descends through the water column during placement. The target thickness of the ENR and ENR+AC materials is 6 inches and at least 4 inches, and an average of approximately 9 inches placed over the existing substrate.

Precision navigation, as well as offset and staggered placement, will be used to ensure precise placement of the ENR and ENR+AC materials at each of the pilot plots.

Equipment that will be used by the contractor includes, but is not limited to, barges (with and without spuds), excavators, tugs, small work boats, and anchors. The disturbance of existing sediments will be limited to disturbance from anchors or barge spuds. The construction of the project does not require dredging of any sediment; however, in the event that material is overplaced within a plot above the placement thickness to such a degree that it may impact navigation, some placed material will be moved using the clamshell bucket and relocated to the perimeter of the appropriate subplot.

Based on field data presented in the Lower Duwamish Waterway Sediment Transport Modeling (STM) Report (Quantitative Environmental Analysis, LLC 2008) during a high-flow event that was in the top 1 percent of measured discharges since 1990, the maximum velocities 1 meter above the bed in the vicinity of the subtidal plot are up to approximately 18 cm/sec. The velocities near the bed are likely to be lower than the 18 cm/sec. Based on Hjulsröm's Diagram, at a velocity of 18 cm/sec, sand sized particles that will be used at the subtidal plot are anticipated to be stable.

### ***1.1.2 Construction Timing***

The completion of in-water construction activities for the pilot study will require 2 to 4 weeks. All in-water work associated with the placement of ENR and ENR+AC materials will be conducted during the authorized 2016–2017 in-water work window of October 1 through February 15 (USACE, 2012) for the LDW, when listed salmonid species are least likely to be present in the LDW. Construction will occur after the end of the Muckleshoot Indian Tribe's netfishery season. Construction is expected to begin in December 2016.

### ***1.1.3 Pre- and Post-Implementation Monitoring***

Pre- and post-implementation monitoring of the three pilot plots will be conducted to assess baseline conditions prior to project activities and to periodically evaluate conditions of the three pilot plots after placement of the ENR and ENR+AC materials.

The following presents an overview of the monitoring activities during the pilot study:

- Bathymetric survey to document pre- and post-placement elevations and Sediment Profiling Imaging to document thickness of placed material;
- Collection of surficial sediment samples for chemical, physical, and benthic taxonomic analyses (benthic taxonomic analyses will be conducted only during Year 3);
- Analysis of PCBs in pore water using passive samplers;
- Use of Sediment Profile Imaging to assess benthic recolonization;
- Use of submerged placement of the ENR and ENR+AC materials will minimize the loss of AC as the ENR+AC material descends through the water column and will also prevent or minimize turbidity plumes that may result as fine material in the ENR and

ENR+AC becomes suspended in the water column upon its release and descent to the sediment bed;

- Prewetting of the ENR+AC material prior to placement to minimize loss of AC during placement of the ENR+AC material; and
- Implementation of a water quality monitoring plan during the ENR and ENR+AC materials placement to assess turbidity downcurrent of the pilot plots. The water quality monitoring results will be provided to the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA).

## 1.2 LDW FEDERAL NAVIGATION CHANNEL

The LDW is a federal navigation channel, authorized under the River and Harbor Act of 1919 and modified by subsequent Acts. As such, it performs functions that must not be adversely affected by other actions.

The USACE is responsible for maintaining the navigation channel to the following authorized depths and widths (Figure 1):

- -30 feet mean lower low water (MLLW) and 200 feet wide from Harbor Island (RM 0.0) to the First Avenue South Bridge (RM 2.0), also known as the Harbor Island and Georgetown Reaches.
- -20 feet MLLW and 150 feet wide from the First Avenue South Bridge (RM 2.0) to Slip 4 (RM 2.8), also known as the First Avenue South Reach.
- -15 feet MLLW and 150 feet wide from Slip 4 (RM 2.8) to the Upper Turning Basin (RM 4.7), also known as the South Park and 14<sup>th</sup> Avenue Bridge Reaches. The authorized dimensions of the navigation channel portion of the Upper Turning Basin are 250 feet wide by 500 feet long (USACE, 2005).

To maintain the navigation channel at the authorized depths, the USACE conducts maintenance dredging every 1 to 3 years in the upstream areas. The area typically dredged under this program is the Upper Turning Basin and downstream to approximately RM 4.0. Maintenance dredging is discussed in more detail later in this document.

Without routine maintenance dredging, shoaling would create a shallower channel and inhibit the safe passage of vessels. The Upper Turning Basin acts as a settling basin for sediments that would normally migrate downstream. In this area, the river channel cross section sharply expands from a somewhat natural section to an engineered channel maintained to be significantly larger than its natural analog. The sharp transition and enlarged channel results in greatly reduced flow velocities, which promotes sediment deposition. Routine maintenance dredging keeps sediments from accumulating beyond the holding capacity of the basin. In the absence of maintenance dredging, the sediment would continue to migrate downstream via bed load transport and settle in downstream areas. Therefore, dredging the shoaled material from the Upper Turning Basin minimizes the need for maintenance dredging in the lower portion of the LDW. The navigation channel downstream of RM 3.35 has not been subjected to

maintenance dredging since 1984, and that was only for a small portion of the navigation channel near Kellogg Island.

Table 1 summarizes USACE maintenance dredging events in the LDW navigation channel between 1986 and 2014. The yearly volumes of sediment dredged from the LDW have varied widely, from a minimum of 34,000 cubic yards (cy) dredged in 1986 to a maximum of 200,000 cy in 1992.

## 2.0 ANALYSIS OF FEDERAL NAVIGATION FUNCTION

This section assesses whether the design of the proposed pilot plot study: (1) is consistent with the authorized navigation channel, (2) impairs the usefulness of the navigation channel, and (3) is “injurious to the public interest.”

### 2.1 VESSEL TRAFFIC IN THE LDW NAVIGATION CHANNEL

A variety of commercial and recreational vessels operate within the LDW navigation channel, including tugboats moving alone or with barges/derricks, fishing vessels, bulk cargo vessels, recreational vessels such as sailboats and motor yachts, and miscellaneous vessels such as fireboats, passenger boats, and research vessels. The LDW is also used by recreational boaters in kayaks.

General information about vessel traffic in the LDW is presented in Riley (2006) and Takasaki (2006). Based on information contained in those two memoranda, vessel traffic in the LDW may be summarized as follows:

- A variety of barges are used in the LDW, typically traveling at speeds of 2 to 3 knots, with a maximum speed of 5 knots. Those that are 400 feet long and 100 feet wide with 14-foot drafts travel to just upstream of the First Avenue Bridge, while those that are 286 feet long and 76 feet wide with 12-foot drafts travel no farther upstream than the South Park Bridge (approximately RM 3.3). There is relatively infrequent barge traffic upstream of RM 3.3, although General Construction Company does have a barge storage area upstream of the South Park Bridge at approximately RM 4.2.
- Ocean-going vessels are always under tug assistance in the LDW, although these vessels may also be self-propelled and do not travel farther upstream than the First Avenue Bridge (approximately RM 2.0). These vessels typically travel at a speed of 2 to 3 knots, with a maximum speed of 5 knots. These vessels are unable to turn around in the LDW, so are towed into Elliott Bay when out-bound.
- The Pilot’s Association indicated that two large vessels travel up to the James Hardie and Glacier docking areas, which are located at approximately RM 1.6. These vessels are 85 feet wide and 600 feet long, with drafts of 20 feet (unloaded) and 30 feet (loaded).
- Yachts traveling to and from Delta Marine, located near RM 4.2, range in length from 100 feet to 160 feet, with drafts of 5.5 feet to 10 feet.

An estimate of the volume of large vessels using the LDW navigation channel can be derived from the number of bridge openings of the five bridges spanning the LDW and the West Waterway. Three are located on the West Waterway: the high-level West Seattle Bridge; a railroad bridge, which remains open unless a train is traversing the waterway; and the Spokane Street Bridge. Two bridges span the LDW: the First Avenue Bridge and the South Park Bridge. Bridges are opened periodically to allow for the passage of vessels that exceed clearance heights. Bridge opening logs provide information on the number, duration, and frequency at which large vessels move under the bridges while open. Records for the Spokane Street, First Avenue, and South Park bridges were reviewed, as presented in the FS, to assess the degree to which vessel traffic varies throughout portions of the LDW (SDOT, 2006; KCDOT, 2006; WSDOT, 2006).

**Spokane Street Bridge:** The Spokane Street Bridge (downstream of the LDW near its mouth) is operated by the Seattle Department of Transportation (SDOT). Bridge opening logs for this bridge, which has a 55-foot clearance above mean high water, record the number of vessels entering and exiting the LDW through the West Waterway and every occasion the bridge is opened. For the purposes of this analysis, only openings for large motorized vessels other than sailboats were considered. Motorized vessels include tugboats and container ships. Vessels with a low clearance do not require the bridge to be opened and are not captured by bridge opening logs.

Monthly bridge openings for large motorized vessels for the period from 2003 to 2005 ranged from 93 openings in February 2005 to 261 openings in March 2003 (Table 2). The average number of monthly openings during this period was 146, or approximately 5 per day. Most of these openings were for tugboat-escorted vessels and barges, representing 75 to 140 per month, with a monthly average of 104, or approximately 3 per day (SDOT, 2006). The logs show that regular vessel traffic is spaced from 1 to several hours apart.

**First Avenue Bridge:** The First Avenue Bridge (at RM 2.0) is a drawbridge operated by the Washington State Department of Transportation (WSDOT). It has a 41-foot clearance at the center span and a 24-foot clearance at the side spans. It opened over 1,300 times annually in both 2005 and 2006, averaging less than 4 openings daily.

**South Park Bridge:** South Park Bridge (RM 3.3); also referred to as the 14th Avenue Bridge, is operated by the King County Department of Transportation (KCDOT). It has a 34-foot clearance at the center span. It was opened between 700 and 800 times annually in 2005 and 2006, approximately twice daily.

## 2.2 CONSISTENCY WITH AUTHORIZED NAVIGATION CHANNEL

Of the three pilot plot areas, only the subtidal plot area will be located in the federal navigation channel at RM 1.2. Two adjacent, half-acre areas (Figure 2) will be evaluated, one in which only ENR material has been placed and the other in which ENR material amended with AC has been

placed. The ENR material in the subtidal plot will consist of clean sand. The target thickness of the ENR and ENR+AC materials is 6 inches with at least 4 inches, and an average of approximately 9 inches placed over the existing substrate and a maximum thickness not to exceed 12 inches.

The west edge of the subtidal plot area will be aligned with and approximately 25 feet from the west edge of the federal navigation channel. Each half-acre area is about 50 feet wide by 465 feet long. The two half-acre areas will be immediately adjacent to one another and aligned in a north-south direction paralleling the federal navigation channel. The combined width of the two half-acre test plots will be 100 feet, so that the west edge of the test plot will be at approximately 30.9 feet MLLW or deeper and the east edge of the test plot at a depth of -36.8 feet MLLW (Figure 2).

Placement of ENR and ENR+AC will decrease the water depth over the one acre of the subtidal plot by an average of 9 inches (0.67 feet), with water depths in some locations along the test plot possibly being decreased by up to 1 foot. Assuming a worst-case scenario that ENR and ENR+AC will be placed at a uniform thickness of 12 inches across the entire subtidal plot, there are seven areas where the modeled depths will be -29.9 feet MLLW. The combined area of these seven locations is approximately 41 square feet. Thus, water depth after placement of the ENR and ENR+AC over the one acre area of the subtidal plot could range from -29.9 feet MLLW to -35.8 feet MLLW across the subtidal plot area. Figures 3a through 3d, which are based on the latest available bathymetry data and the assumption of a uniform ENR and ENR+AC thickness of 1 foot, depict eight cross-sectional views through the ENR and ENR+AC subtidal plots at 50-foot intervals beginning 50 feet from the north end of the proposed subtidal plots.

The available information indicate that the largest vessels using the LDW travel up to the James Hardie and Glacier docking areas, which are located at approximately RM 1.6. These two vessels are 85 feet wide and 600 feet long, with drafts of 20 feet (unloaded) and 30 feet (loaded). When loaded, it is most likely that these vessels would depart their moorages on a high tide to avoid contact with the substrate. The mean high water in the LDW is +10.24 feet MLLW (USACE, 2000); therefore at mean high water, the water depth at the shallowest points along the subtidal plot would be 40.14 feet, providing sufficient clearance between the hulls of these large vessels and the highest point along the subtidal plot.

The modeled net sedimentation rate in the LDW at the proposed location of the subtidal plot is 1.7 centimeters (0.67 inch) per year. Therefore it would require approximately 18 years for another foot of sediment to deposit over the subtidal plot. Assuming a uniform thickness of 1 foot of ENR and ENR+AC over the area covered by the subtidal plot, adding another foot of sediment deposition over the subtidal plot would result in water depths ranging from 39.1 feet to 46.0 feet at mean high water. This depth range would still provide sufficient clearance between the substrate and hulls of the largest ships currently using this reach of the LDW.



Other shallower-draft vessels, both commercial and recreational, navigating the reach of the LDW where the subtidal plot will be located are not expected to be affected by placement of the subtidal plot. Therefore, the subtidal plot is not expected to affect the usefulness of the navigation channel or to be inconsistent with the authorized navigation channel.

Placement of the subtidal plot is not expected to be injurious to the public interest.

### **3.0 TECHNICAL ANALYSIS AND ADEQUACY OF DESIGN**

The design of the pilot study was prepared by a group of expert scientist and engineers using standard scientific and engineering practices. The pilot study was designed to place the minimum amount of fill to meet the goals of the project and considered the placement precision of various types of equipment that may be used during the construction. Prior to implementation the design will require approval by Ecology and EPA.

### **4.0 REAL ESTATE ANALYSIS**

There are no real property interests required to support the proposed alteration of the navigation channel (per page 12 of EC 1165-2-216); therefore, no analysis of real estate is required.

### **5.0 ENVIRONMENTAL RISK**

A biological evaluation (BE) was prepared for the pilot study for Section 7 consultation under the Endangered Species Act. Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound steelhead trout (*O. mykiss*), Coastal/Puget Sound bull trout (*Salvelinus confluentus*), and Dolly Varden trout (*S. malma*) are listed salmonids using the LDW and were the primary species addressed in the BE. The BE assessed potential effects of the pilot study on existing environmental conditions in the LDW, listed species that use the LDW, and the critical habitats of the listed species in the LDW.

The pilot study is not expected to substantially alter existing environmental conditions within the LDW. Potential impacts on existing environmental conditions in the Action Area defined for this biological evaluation are the following:

- Placement of ENR and ENR+AC materials may result in temporary and localized increases in turbidity in the water column.
- Physical and conventional sediment characteristics (e.g., grain size and total organic carbon) within the pilot plot areas may be altered in the short term relative to those of the surrounding sediments. In the long term, the physical and conventional sediment characteristics are expected to return to current conditions by means of natural riverine processes.
- Placement of ENR and ENR+AC on sediments that are contaminated with PCBs will reduce the exposure of aquatic organisms to PCBs within those areas.
- The ENR and ENR+AC materials placed during the pilot study will be approximately 6 to 9 inches thick, with a maximum thickness of 12 inches, and are not expected to substantially alter the bathymetry in the pilot plots.

- Placement of ENR and ENR+AC materials will bury benthic habitat in the pilot plots; however, two of the pilot plot areas are subtidal, located in areas unlikely to provide preferred foraging habitat for juvenile salmonids.
- The pilot study will have no effect on access and refugia; flow, water current patterns, saltwater-freshwater mixing; marine macroalgae and macrophytes; forage fish; or ambient noise within the LDW.

A number of conservation measures and BMPs will be implemented to minimize and avoid impacts on listed species and the environment during in-water work activities:

- The completion of in-water construction activities for the pilot study will require 2 to 4 weeks. All in-water work associated with the placement of ENR and ENR+AC materials will be conducted during the authorized 2016–2017 in-water work window of October 1 through February 15 (USACE, 2012) for the LDW, when listed salmonid species are least likely to be present in the LDW.
- Construction will occur after the end of the Muckleshoot Indian Tribe's salmonid netfishery season. Construction is expected to begin in late December 2016.
- Use of submerged placement of the ENR and ENR+AC materials will decrease the spread of material outside the placement boundaries and minimize the loss of AC as the ENR+AC descends through the water column and will also prevent or minimize turbidity plumes that may result as fine material in the ENR and ENR+AC becomes suspended in the water column upon its release and descent to the sediment bed.
- Prewetting of the ENR+AC material prior to placement will minimize loss of AC during placement of the ENR+AC materials. and
- Implementation of a water quality monitoring plan during the ENR and ENR+AC material placement will assess turbidity downcurrent of the pilot plots. The water quality monitoring results will be provided to Ecology and EPA.

The following BMPs will also be implemented to minimize and avoid impacts on listed species and the environment during in-water activities:

- All mechanized equipment will be maintained in proper operating condition, with equipment inspections occurring prior to each workday. Equipment found to be leaking petroleum products or hydraulic fluid will be removed from the site for maintenance.
- Drip pads or pans will be placed under mechanized equipment to contain any potential leaks of petroleum products or hydraulic fluids.
- To the extent possible, vegetable-based hydraulic fluids will be used.
- A spill kit will be kept on work vessels to contain any potential petroleum spills that might occur.
- Ecology and the U.S. Coast Guard will be contacted immediately in the event of a spill.

- Any project-related debris or wastes will be placed in appropriate containers for off-site disposal. No project-related debris or wastes will be allowed to enter the water.
- Barges and work vessels will not be allowed to run aground on the substrate. Work barges will be held on station with spuds or anchors.

The placement of the subtidal plot within the authorized navigation channel is unlikely to adversely affect the environment within the LDW, but is expected to have a net beneficial effect through reducing exposure of aquatic biota to PCB-contaminated sediments covered by the ENR and ENR+AC in the subtidal plot area.

## **6.0 FLOODPLAIN MANAGEMENT CONSIDERATIONS**

There are no anticipated impacts to floodplains due to construction of the pilot study. The elevation of the subtidal plot will be at or below the authorized navigation channel depth. Any changes in water surface elevation due to construction of the pilot study plot will be within the range of the water surface elevations that would be expected from natural deposition of sediments within the navigation channel.

## **7.0 RESIDUAL RISK ANALYSIS**

Little, if any, residual risk is expected as a result of the proposed action. As discussed in the above sections, the placement of the proposed subtidal plot in the federal navigation channel is not expected to affect the usefulness or the functionality of the federal navigation channel, thus allowing commercial and recreational vessels to safely use the channel. Furthermore, the proposed action is not expected to adversely affect the environmental conditions within the federal navigation channel, nor is the proposed action expected to adversely affect the floodplain.

## **8.0 IMPACTS TO CORPS OF ENGINEERS OPERATIONS AND MAINTENANCE**

The placement of the fill in the subtidal plot will not impact the ability of the Corps of Engineers to maintain the authorized navigation channel. The material to be placed is comprised of sand and is easily dredged. If this reach of the navigation channel is dredged in the future, localized portions of the clean ENR material placed by this project could be incidentally removed by the navigation dredging, depending on the overdepth specifications, equipment selection, and operational controls of the navigation dredging project. However, based on the Corps dredging records presented in Table 1, this area has not been dredged in the last 30 years and it is unlikely to be dredged in the foreseeable future.

The issue discussed above would not affect USACE O&M of the federal channel. As with all ENR areas identified in EPA's LDW ROD; if future disturbances to the ENR areas affect the

protectiveness of the remedy, the Performing Parties that implement the remedy will be responsible for any needed repairs.

## **9.0 SUMMARY AND CONCLUSIONS**

The placement of the proposed subtidal plot in the federal navigation channel is not expected to adversely affect the usefulness or functionality of the channel.

## 10.0 REFERENCES

- Dredged Materials Management Program (DMMP). 2009. Determination Regarding the Suitability of Federal Operation and Maintenance Dredged Material from the Duwamish River, Section 13 – References Seattle, King County, Washington (Public Notice CENWS-OD-TS-NS-26) Evaluated Under Section 404 of the Clean Water Act for Beneficial Use or Unconfined Openwater Disposal at the Elliott Bay Nondispersive Site. October 15, 2009.
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- U.S. Army Corps of Engineers (USACE). 2010. Payment Summary for fiscal year 2009 dredging of Lower Duwamish Waterway navigation channel. April 13, 2010. USACE, Seattle District, Seattle, Washington.
- U.S. Army Corps of Engineers (USACE). 2012. Approved Work Windows for Fish Protection for All Marine/Estuarine Areas Excluding the Mouth of the Columbia River (Baker Bay) by Tidal Reference Area. Corps, Seattle District, Seattle, Washington. Available at: [http://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA%20forms%20and%20templates/Marine%20Fish%20Work%20Windows%20\(8-14-12\).pdf](http://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA%20forms%20and%20templates/Marine%20Fish%20Work%20Windows%20(8-14-12).pdf) (accessed June 2, 2015).
- Washington State Department of Transportation (WSDOT). 2006. First Avenue Bridge opening records. 2005, 2006. Provided by Williams, T., Northwest Region Bridge/Structures Maintenance & Operations Manager. December 18, 2006.

**Attachments**

Table 1 – Lower Duwamish Waterway Navigation Channel Maintenance Dredging (1986-2010)

Table 2 – Number of Monthly Lower Duwamish Waterway Bridge Opening (2003-2006)

Figure 1 – Vicinity Map

Figure 2 – Plan View of Subtidal Plot Area

Figures 3a to 3d – Cross Sections

## **TABLES**

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**TABLE 1**

**LOWER DUWAMISH WATERWAY NAVIGATION  
 CHANNEL MAINTENANCE DREDGING (1986-2010) <sup>1</sup>**  
 Enhanced Natural Recovery/Activated Carbon Pilot Study  
 Lower Duwamish Waterway  
 Seattle, Washington

River Mile	Dredge Date		Volume Dredged
	Begin	End	(cubic yards)
4.19 to 4.38	03/11/86	03/29/86	33,637
4.38 to 4.65	06/19/86	07/15/86	126,470
4.38 to 4.65	02/24/87	03/24/87	80,160
3.97 to 4.65	02/28/90	03/30/90	127,619
3.34 to 4.65	02/06/92	03/21/92	199,361
4.33 to 4.65	03/07/94	03/28/94	57,243
4.02 to 4.48	02/22/96	03/30/96	90,057
4.26 to 4.65	02/05/97	03/31/97	89,011
3.43 to 4.65	03/11/99	06/29/99	165,116
4.27 to 4.65	01/14/02	02/09/02	96,523
4.33 to 4.75	01/15/04	02/16/04	75,770
4.27 to 4.65	12/11/07	01/10/08	140,608
4.18 to 4.65	02/19/10	03/30/10	60,371
4.00 to 4.61	12/01/11	02/09/12	152,349
4.02 to 4.03	01/28/13	02/17/13	4,640
4.03 to 4.61	12/27/13	02/01/14	67,552
-0.03 to 0.00	12/27/13	02/01/14	2,300

Note(s)

<sup>1</sup> Sources: USACE, 2005; USACE, 2010; DMMP, 2009, David Fox Chief, DMMO personal communication July 17, 2015.



**TABLE 2**

**NUMBER OF MONTHLY LOWER DUWAMISH WATERWAY BRIDGE OPENING (2003-2006)**

Enhanced Natural Recover/Activated Carbon Pilot Study

Lower Duwamish Waterway

Seattle, Washington

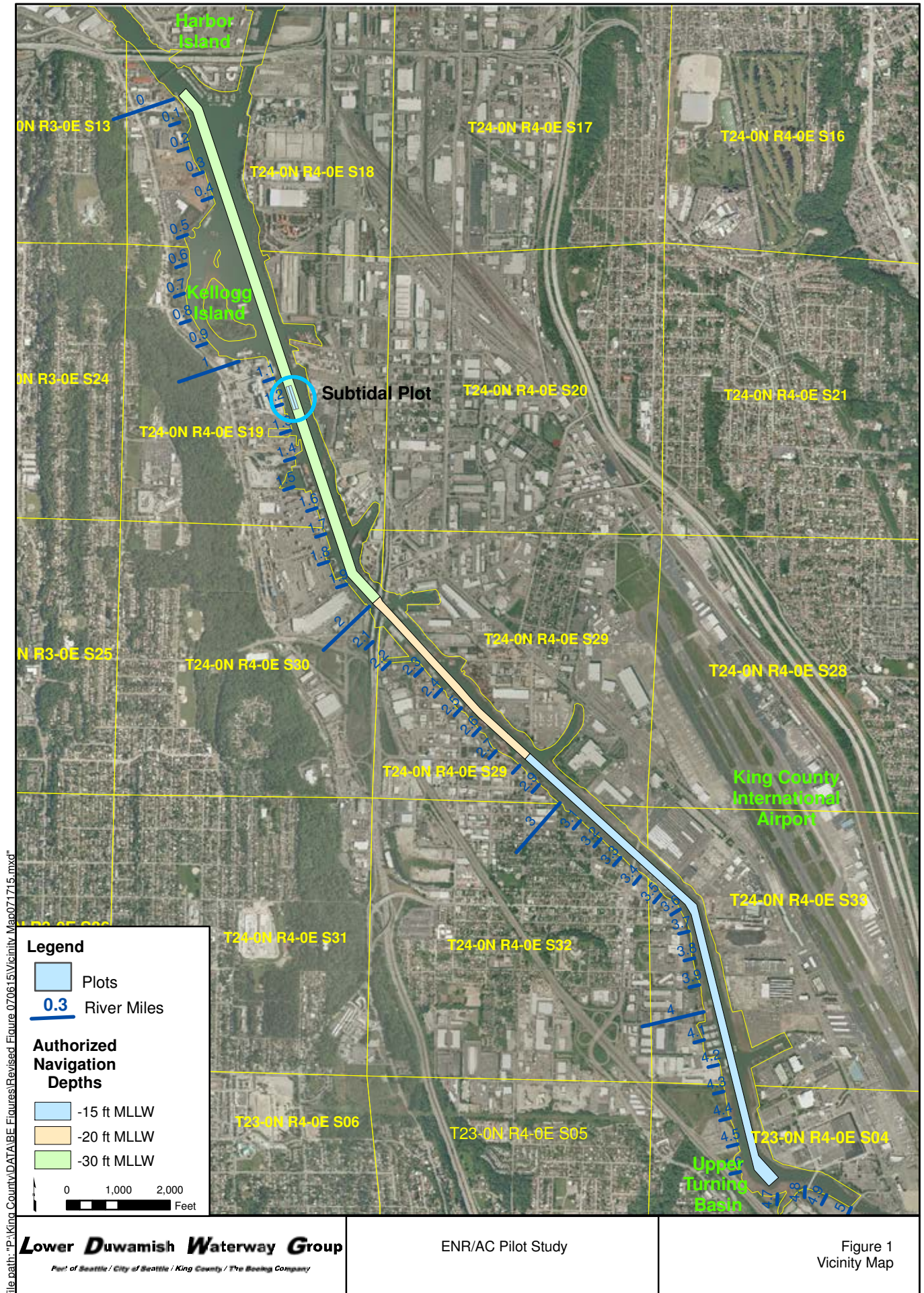
Year	Openings	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Average	Daily Average
<b>Spokane Street Bridge<sup>1</sup></b>															
2003	All motorized vessels	228	208	261	207	193	165	133	139	95	143	122	103	166	5.5
	Tugboat-escorted vessels and barges	93	83	124	106	140	112	105	113	76	109	84	79	102	3.4
	Openings within 1 hour	68	41	81	58	50	42	20	31	16	17	21	17	39	1.3
2004	All motorized vessels	121	105	133	139	138	145	164	115	112	149	152	152	135	4.5
	Tugboat-escorted vessels and barges	95	85	97	113	111	101	133	105	98	109	94	110	104	3.4
	Openings within 1 hour	16	9	18	23	35	26	40	8	16	23	37	23	23	0.8
2005	All motorized vessels	117	93	142	133	152	166	131	160	142	143	136	105	135	4.4
	Tugboat-escorted vessels and barges	80	77	115	113	112	131	104	132	115	103	107	75	105	3.5
	Openings within 1 hour	19	10	26	29	34	33	15	38	19	22	27	10	24	0.8
<b>First Avenue Bridge<sup>2</sup></b>															
2005	All openings	108	119	175	158	168	147	116	135	115	92	93	124	129	4.3
2006		112	83	129	145	155	142	182	146	139	125	—	—	136	4.5
<b>South Park Bridge<sup>3</sup></b>															
2005	All openings	39	63	76	47	42	59	95	76	80	53	35	46	59	2
2006		39	42	42	82	101	88	125	98	81	59	—	—	76	2.5

Note(s)

1. Source: SDOT, 2006.
2. Source: WDOT, 2006.
3. Source: KCDOT, 2006.

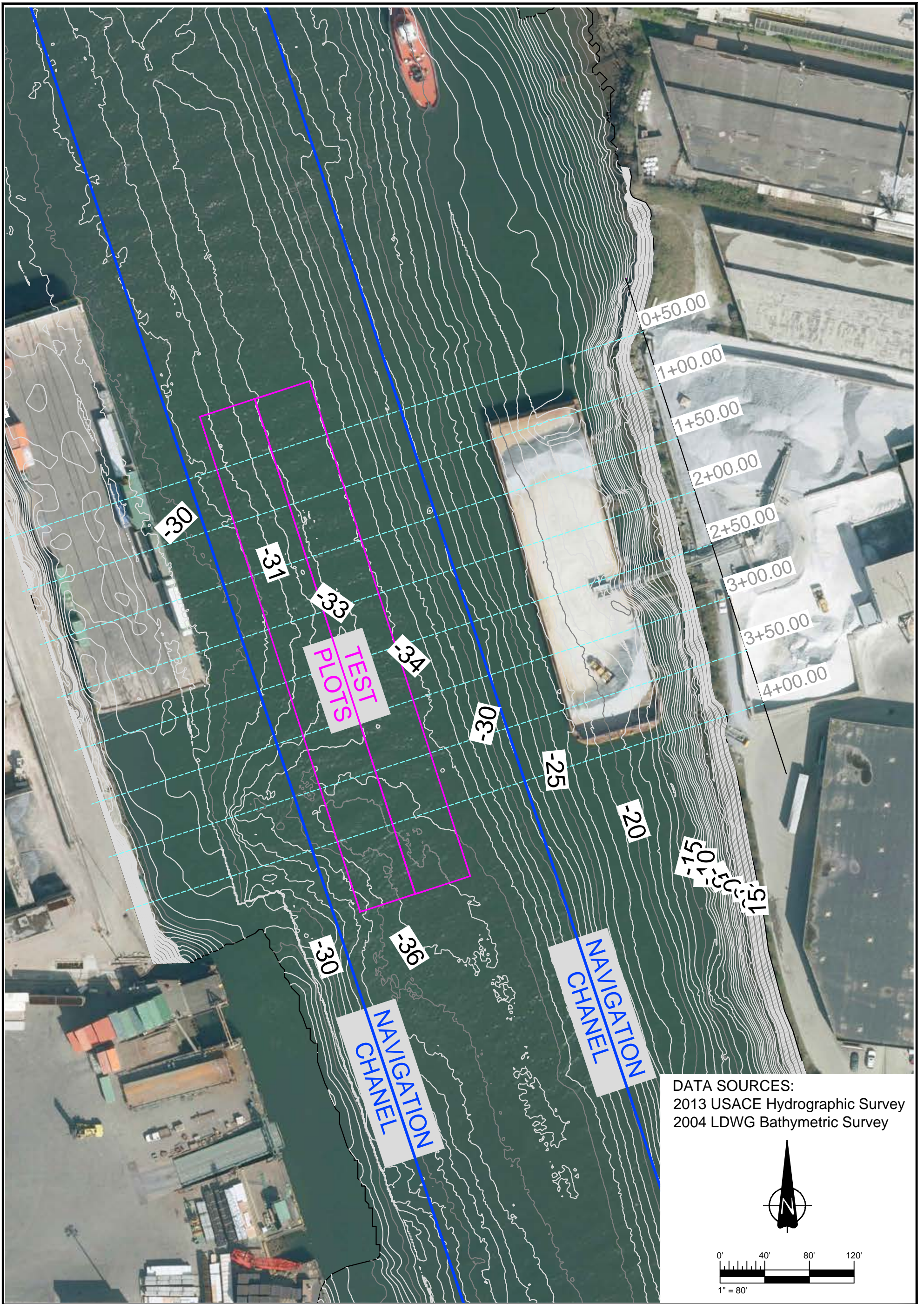
## **FIGURES**

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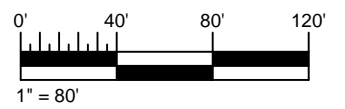
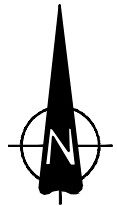


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DATA SOURCES:  
 2013 USACE Hydrographic Survey  
 2004 LDWG Bathymetric Survey



LOWER DUWAMISH WATERWAY GROUP

Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 3500 188th St SW, Suite 601  
 Lynnwood, WA 98037

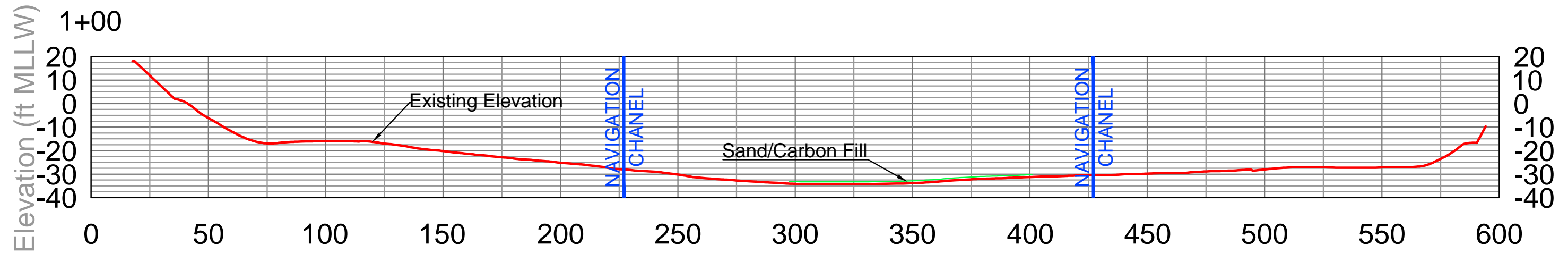
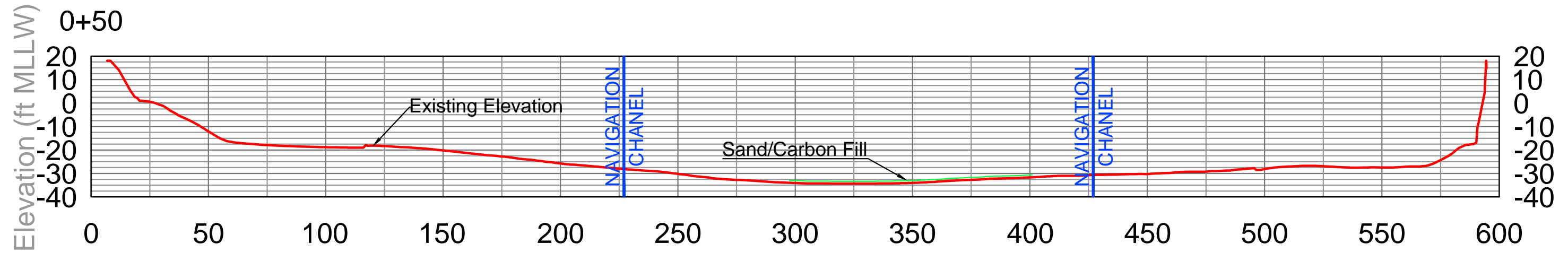


Enhanced Natural Recovery/Activated  
 Carbon Pilot Study

Plan View of Subtidal Plot Area

DATE	July 17, 2015
SCALE	1" = 80'
PROJECT NO.	LY15160310.300.328
FIGURE	2





View Looking Upstream

LOWER DUWAMISH WATERWAY GROUP

Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 3500 188th St SW, Suite 601  
 Lynnwood, WA 98037



Enhanced Natural Recovery/Activated  
 Carbon Pilot Study

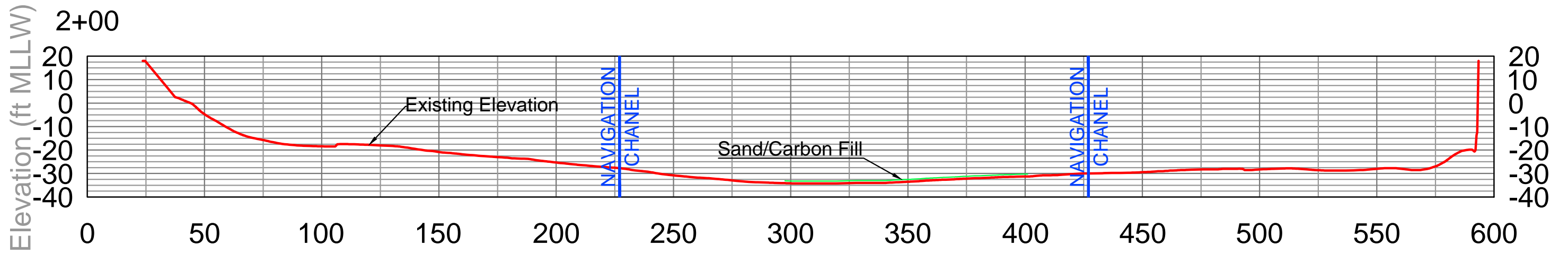
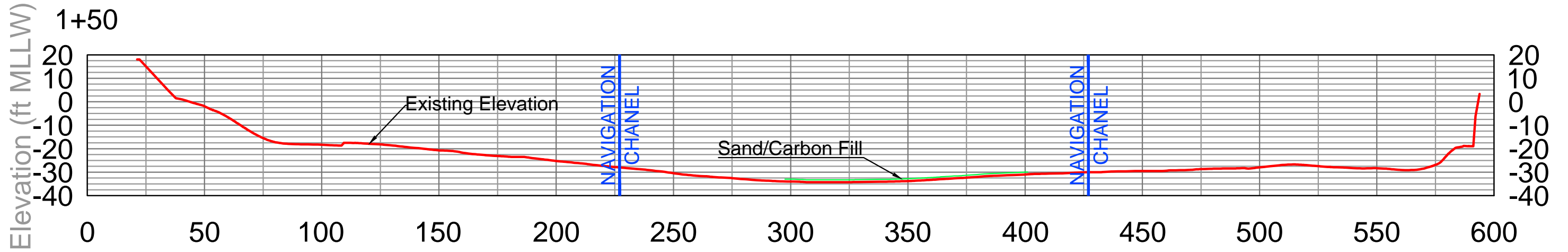
Cross Sections

DATE  
 July 17, 2015

SCALE

PROJECT NO.  
 LY15160310.300.328

FIGURE  
 3a



View Looking Upstream

LOWER DUWAMISH WATERWAY GROUP

Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 3500 188th St SW, Suite 601  
 Lynnwood, WA 98037



Enhanced Natural Recovery/Activated  
 Carbon Pilot Study

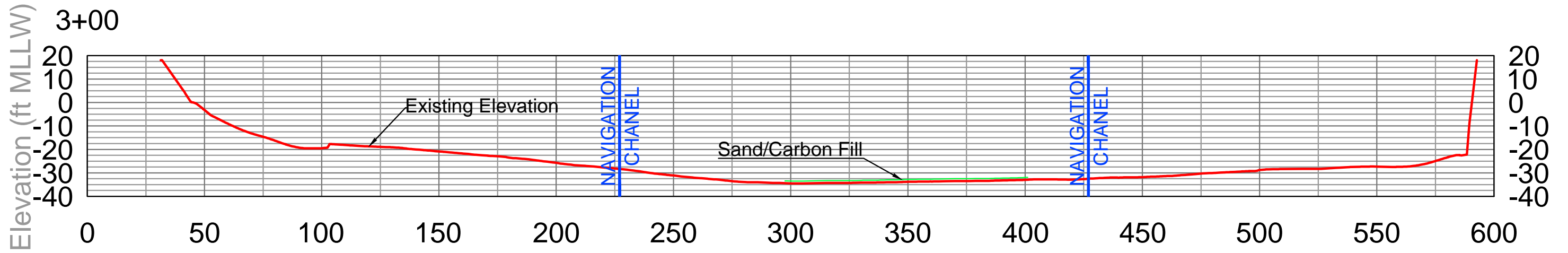
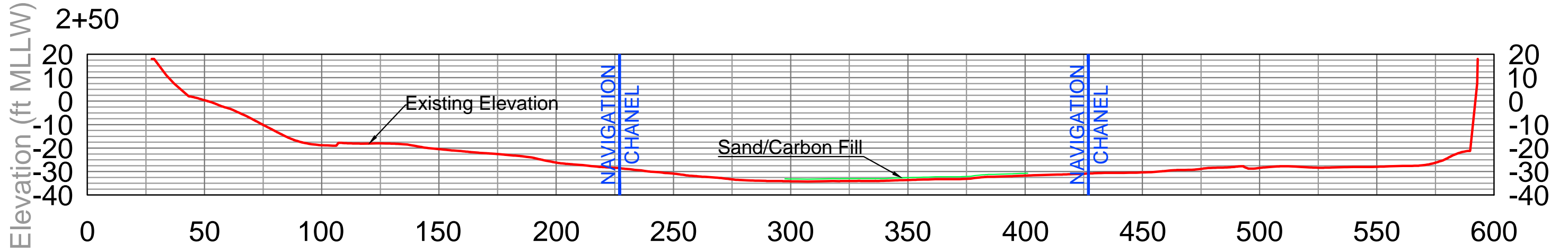
Cross Sections

DATE  
 July 17, 2015

SCALE

PROJECT NO.  
 LY15160310.300.328

FIGURE  
 3b



View Looking Upstream

LOWER DUWAMISH WATERWAY GROUP

Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 3500 188th St SW, Suite 601  
 Lynnwood, WA 98037

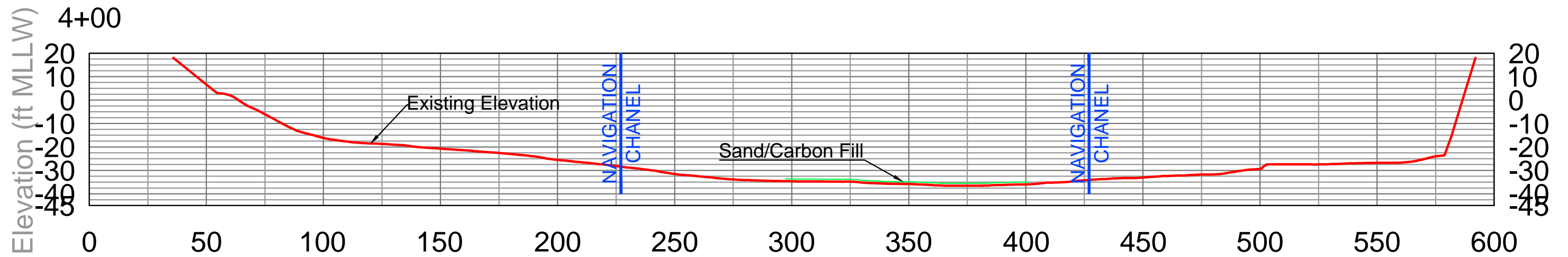
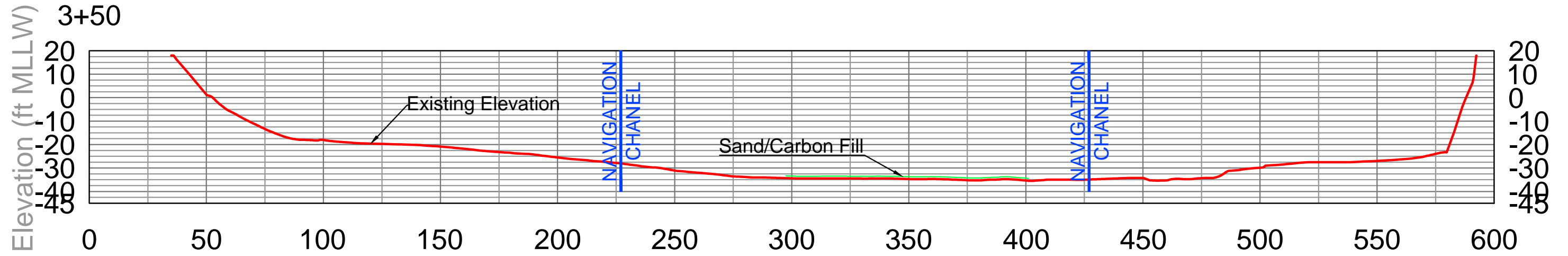


Enhanced Natural Recovery/Activated  
 Carbon Pilot Study

Cross Sections

DATE	July 17, 2015
SCALE	
PROJECT NO.	LY15160310.300.328
FIGURE	3c

DRAWN BY: GSM, CHECKED BY: CJW



View Looking Upstream

LOWER DUWAMISH WATERWAY GROUP

Amec Foster Wheeler  
Environment & Infrastructure, Inc.  
3500 188th St SW, Suite 601  
Lynnwood, WA 98037



Enhanced Natural Recovery/Activated  
Carbon Pilot Study

Cross Sections

DATE  
July 17, 2015

SCALE

PROJECT NO.  
LY15160310.300.328

FIGURE  
3d



**ENCLOSURE 2**

**NWS ATR TEAM COMMENTS**

## **NWS Section 408 ATR Team Comments**

### **Lower Duwamish Waterway ENR+AC Pilot Study**

The following questions were submitted to the Environmental Protection Agency on August 28, 2015, with a request to revise the Section 408 memorandum to address these questions. The EPA re-submitted a revised Section 408 Memorandum to NWS on September 23, 2015. The revised document adequately addressed all questions identified below.

#### **Hydraulic/Hydrologic Impacts**

1. Has there been a hydraulic analysis performed in the design of the project?
2. Specifically looking to answer the following three questions in regards to the hydraulic modeling.
3. What are the maximum velocities in the project footprint?
4. Is the sand proposed for placemen stable under those velocities?
5. Will the placement of the cap result in substantial adverse changes in water surface profiles or flow velocities within the channel? (This should answer the floodplain management considerations section, as well.)

**ENCLOSURE 3**  
**ATR CERTIFICATION**

## **Certification of Legal Sufficiency**

The ATR Legal Certification depicts the legal sufficiency of the proposed alteration. All legal concerns have been resolved with the proposed Lower Duwamish Waterway Enhanced Natural Resources and Activated Carbon Pilot Study Section 408 substantive review.

**RYAN.VIRGINIA**  
**.K.1369747491**

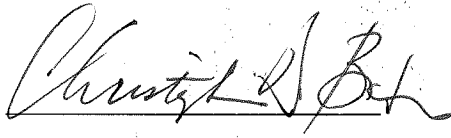
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cn=RYAN.VIRGINIA.K.1369747491  
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**Virginia K. Ryan**  
**Assistant District Counsel**

**Real Estate Compliance Certification**

This ATR Certification demonstrates that the real estate documentation reviewed by the ATR team is adequate and the review is complete. No real estate is necessary for the alteration.



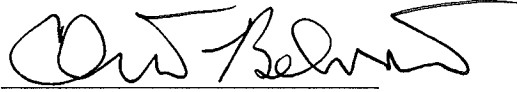
**Chris Borton, Real Estate Division Chief**

10-13-2015

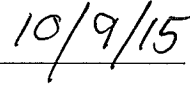
**Date**

### Policy Compliance Certification

This ATR certification ensures appropriate quality control and assurance has been conducted for the project and confirms that the proposed alteration and technical review is consistent with policy and is adequate to support the type of alteration and project complexity. All policy and technical issues have been addressed and resolved through the ATR.



for Valerie Ringold, Planning Branch Chief



Date

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Carolyn Fitzgerald, H&H Branch Chief

Date

---

Travis Shaw, Technical Services Branch

Date

---

Amy Reese, Operations Support Branch

Date

### Policy Compliance Certification

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Valerie Ringold, Planning Branch Chief

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Date

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Carolyn Fitzgerald, H&H Branch Chief

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Travis Shaw, Technical Services Branch

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Date

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Amy Reese, Operations Support Branch

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Date

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Valerie Ringold, Planning Branch Chief

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Carolyn Fitzgerald, H&H Branch Chief

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13 Oct 2015

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Travis Shaw, Technical Services Branch

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Date

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Amy Reese, Operations Support Branch

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Date



### Policy Compliance Certification

This ATR certification ensures appropriate quality control and assurance has been conducted for the project and confirms that the proposed alteration and technical review is consistent with policy and is adequate to support the type of alteration and project complexity. All policy and technical issues have been addressed and resolved through the ATR.

\_\_\_\_\_  
Valerie Ringold, Planning Branch Chief

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Date

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Carolyn Fitzgerald, H&H Branch Chief

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Date

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Travis Shaw, Technical Services Branch

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Date

E-Signed by REESE.AMY.R.1161223596  
VERIFY authenticity with ApproveIt  
**REESE.AMY.R.1161223596**

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Amy Reese, Operations Support Branch

\_\_\_\_\_  
Date

**ENCLOSURE 4**

**DNR Letter**



April 27, 2015

Pamela Erstad, Program Manager  
Regulatory Compliance & Land Acquisition Services  
Wastewater Treatment Division  
201 South Jackson Street, Suite 505  
Seattle Washington 98104-3855

Dear Ms. Erstad:

I am writing in response to the County's request for access authorization for submerged land in the Lower Duwamish Waterway (the "LDW") for the purpose of work required for an Enhanced Natural Recovery-Activated Carbon Pilot Study (the "Study"). The Study is being carried out by the Port of Seattle, City of Seattle, King County and the Boeing Company (collectively, the Lower Duwamish Waterway Group, or "LDWG") pursuant to an amendment to the U.S. Environmental Protection Agency and Washington Department of Ecology Administrative Order on Consent for the LDW Remedial Investigation/Feasibility Study (Second Amendment to CERCLA Docket No. 10-2001-0055). The Study will evaluate the effect of applying activated carbon to *in situ* contaminated sediments in plots at three LDW locations. The County is the contracting agent for the LDWG parties and is responsible for securing access on behalf of the contractor that will be performing the field work for the Study.

Ownership interests in property on which the Study will take place are unclear due to a complex historical record and conflicting documentation. To the extent the State has ownership interests in the submerged land at the three locations in the LDW where the Study will take place, the Department of Natural Resources authorizes access and use of the submerged lands at those locations for all LDWG parties, including King County and its contractor, to carry out the Study.

Sincerely,

Kristin Swenddal, Manager  
Aquatic Resources Division

# Lower Duwamish Waterway Group

*Port of Seattle / City of Seattle / King County / The Boeing Company*

---

## Memorandum

**To:** Lower Duwamish Waterway Group

**From:** Amec Foster Wheeler Environment & Infrastructure, Inc.  
Dalton, Olmstead & Fuglevand, Inc.  
Ramboll Environ  
Floyd|Snider  
Geosyntec Consultants

**Date:** September 23, 2015

**Subject:** **U.S. Army Corps of Engineers – Section 408 Substantive Compliance Memorandum for Placement of Subtidal Pilot Plot in the Federal Navigation Channel**

---

This memorandum is intended to evaluate substantive compliance per requirements of 33 USC § 408 (Section 408) for the construction of an Enhanced Natural Recovery/Activated Carbon pilot study plot. This memorandum was generated using Engineering Circular guidance (EC 1165-2-216) as per the U.S. Army Corps of Engineers (USACE) request. The pilot study is being performed by the Lower Duwamish Waterway Group (LDWG) per the Second Amendment (July 2014) to the Administrative Order on Consent (Order) for Remedial Investigation/Feasibility Study for the Lower Duwamish Waterway (Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 10-2001-0055, issued on December 20, 2000).

Because the intertidal and scour plot areas are not located within the federal navigation channel, this memorandum will only address potential effects of the subtidal plot (Figure 1) as per requirements of 33 USC § 408 (Section 408).

The memorandum consists of the following sections:

- Section 1.0 – Project Description and the LDW Federal Navigation Channel.
- Section 2.0 – Analysis of Federal Navigation Function.
- Section 3.0 – Technical Analysis and Adequacy of Design.
- Section 4.0 – Real Estate Analysis.
- Section 5.0 – Environmental Risk.
- Section 6.0 – Floodplain Management Considerations.
- Section 7.0 – Residual Risk Analysis.

- Section 8.0 – Impacts to Corps of Engineers Operations and Maintenance.
- Section 9.0 – Summary and Conclusions.
- Section 10.0 – References.

## 1.0 PROJECT DESCRIPTION AND THE LDW FEDERAL NAVIGATION CHANNEL

This section provides brief descriptions of the pilot plot study and the Lower Duwamish Waterway (LDW) federal navigation channel. The complete Draft Design Package for the pilot study was provided to EPA on July 22, 2015.

### 1.1 PILOT PLOT STUDY

This section provides a description of the pilot study, including the active placement of the ENR and ENR+AC materials, as well as pre- and post-implementation monitoring of the pilot plots.

The pilot study will evaluate the effectiveness of ENR+AC compared to ENR alone as a remedial sediment cleanup action in three areas of the LDW in which sediments are contaminated with polychlorinated biphenyls (PCBs); they are designated as the intertidal, subtidal, and scour plots. In each plot, two adjacent, half-acre areas will be evaluated, one in which only ENR material has been placed and the other in which ENR material amended with AC has been placed. The ENR material in the subtidal plot will consist of clean sand. In all three plots, the ENR+AC material will also contain granular AC at a concentration of 1 to 3 percent. The proposed AC concentration is sufficient to sequester PCBs (and to reduce bioavailability) but is not expected to adversely affect benthic biota.

Conservation measures and best management practices (BMPs) for the construction of the pilot study are described in Section 5.0.

#### 1.1.1 Construction Elements

It is anticipated that a barge-mounted fixed-arm excavator with a clamshell bucket will be used for submerged placement of the ENR and ENR+AC materials. The submerged release of the ENR and ENR+AC materials a few feet above the substrate will minimize the loss of AC as the ENR+AC material descends through the water column and will also minimize turbidity plumes that may result as fine particles in the ENR and ENR+AC materials become suspended in the water column and descend to the bottom substrate. The ENR+AC material will be preblended to meet the target concentration of AC and presoaked prior to placement. Presoaking of the ENR+AC material will help to minimize the loss of AC as the ENR+AC material descends through the water column during placement. The target thickness of the ENR and ENR+AC materials is 6 inches and at least 4 inches, and an average of approximately 9 inches placed over the existing substrate.

Precision navigation, as well as offset and staggered placement, will be used to ensure precise placement of the ENR and ENR+AC materials at each of the pilot plots.

Equipment that will be used by the contractor includes, but is not limited to, barges (with and without spuds), excavators, tugs, small work boats, and anchors. The disturbance of existing sediments will be limited to disturbance from anchors or barge spuds. The construction of the project does not require dredging of any sediment; however, in the event that material is overplaced within a plot above the placement thickness to such a degree that it may impact navigation, some placed material will be moved using the clamshell bucket and relocated to the perimeter of the appropriate subplot.

Based on field data presented in the Lower Duwamish Waterway Sediment Transport Modeling (STM) Report (Quantitative Environmental Analysis, LLC 2008) during a high-flow event that was in the top 1 percent of measured discharges since 1990, the maximum velocities 1 meter above the bed in the vicinity of the subtidal plot are up to approximately 18 cm/sec. The velocities near the bed are likely to be lower than the 18 cm/sec. Based on Hjulsröm's Diagram, at a velocity of 18 cm/sec, sand sized particles that will be used at the subtidal plot are anticipated to be stable.

### ***1.1.2 Construction Timing***

The completion of in-water construction activities for the pilot study will require 2 to 4 weeks. All in-water work associated with the placement of ENR and ENR+AC materials will be conducted during the authorized 2016–2017 in-water work window of October 1 through February 15 (USACE, 2012) for the LDW, when listed salmonid species are least likely to be present in the LDW. Construction will occur after the end of the Muckleshoot Indian Tribe's netfishery season. Construction is expected to begin in December 2016.

### ***1.1.3 Pre- and Post-Implementation Monitoring***

Pre- and post-implementation monitoring of the three pilot plots will be conducted to assess baseline conditions prior to project activities and to periodically evaluate conditions of the three pilot plots after placement of the ENR and ENR+AC materials.

The following presents an overview of the monitoring activities during the pilot study:

- Bathymetric survey to document pre- and post-placement elevations and Sediment Profiling Imaging to document thickness of placed material;
- Collection of surficial sediment samples for chemical, physical, and benthic taxonomic analyses (benthic taxonomic analyses will be conducted only during Year 3);
- Analysis of PCBs in pore water using passive samplers;
- Use of Sediment Profile Imaging to assess benthic recolonization;
- Use of submerged placement of the ENR and ENR+AC materials will minimize the loss of AC as the ENR+AC material descends through the water column and will also prevent or minimize turbidity plumes that may result as fine material in the ENR and

ENR+AC becomes suspended in the water column upon its release and descent to the sediment bed;

- Prewetting of the ENR+AC material prior to placement to minimize loss of AC during placement of the ENR+AC material; and
- Implementation of a water quality monitoring plan during the ENR and ENR+AC materials placement to assess turbidity downcurrent of the pilot plots. The water quality monitoring results will be provided to the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA).

## 1.2 LDW FEDERAL NAVIGATION CHANNEL

The LDW is a federal navigation channel, authorized under the River and Harbor Act of 1919 and modified by subsequent Acts. As such, it performs functions that must not be adversely affected by other actions.

The USACE is responsible for maintaining the navigation channel to the following authorized depths and widths (Figure 1):

- -30 feet mean lower low water (MLLW) and 200 feet wide from Harbor Island (RM 0.0) to the First Avenue South Bridge (RM 2.0), also known as the Harbor Island and Georgetown Reaches.
- -20 feet MLLW and 150 feet wide from the First Avenue South Bridge (RM 2.0) to Slip 4 (RM 2.8), also known as the First Avenue South Reach.
- -15 feet MLLW and 150 feet wide from Slip 4 (RM 2.8) to the Upper Turning Basin (RM 4.7), also known as the South Park and 14<sup>th</sup> Avenue Bridge Reaches. The authorized dimensions of the navigation channel portion of the Upper Turning Basin are 250 feet wide by 500 feet long (USACE, 2005).

To maintain the navigation channel at the authorized depths, the USACE conducts maintenance dredging every 1 to 3 years in the upstream areas. The area typically dredged under this program is the Upper Turning Basin and downstream to approximately RM 4.0. Maintenance dredging is discussed in more detail later in this document.

Without routine maintenance dredging, shoaling would create a shallower channel and inhibit the safe passage of vessels. The Upper Turning Basin acts as a settling basin for sediments that would normally migrate downstream. In this area, the river channel cross section sharply expands from a somewhat natural section to an engineered channel maintained to be significantly larger than its natural analog. The sharp transition and enlarged channel results in greatly reduced flow velocities, which promotes sediment deposition. Routine maintenance dredging keeps sediments from accumulating beyond the holding capacity of the basin. In the absence of maintenance dredging, the sediment would continue to migrate downstream via bed load transport and settle in downstream areas. Therefore, dredging the shoaled material from the Upper Turning Basin minimizes the need for maintenance dredging in the lower portion of the LDW. The navigation channel downstream of RM 3.35 has not been subjected to

maintenance dredging since 1984, and that was only for a small portion of the navigation channel near Kellogg Island.

Table 1 summarizes USACE maintenance dredging events in the LDW navigation channel between 1986 and 2014. The yearly volumes of sediment dredged from the LDW have varied widely, from a minimum of 34,000 cubic yards (cy) dredged in 1986 to a maximum of 200,000 cy in 1992.

## **2.0 ANALYSIS OF FEDERAL NAVIGATION FUNCTION**

This section assesses whether the design of the proposed pilot plot study: (1) is consistent with the authorized navigation channel, (2) impairs the usefulness of the navigation channel, and (3) is “injurious to the public interest.”

### **2.1 VESSEL TRAFFIC IN THE LDW NAVIGATION CHANNEL**

A variety of commercial and recreational vessels operate within the LDW navigation channel, including tugboats moving alone or with barges/derricks, fishing vessels, bulk cargo vessels, recreational vessels such as sailboats and motor yachts, and miscellaneous vessels such as fireboats, passenger boats, and research vessels. The LDW is also used by recreational boaters in kayaks.

General information about vessel traffic in the LDW is presented in Riley (2006) and Takasaki (2006). Based on information contained in those two memoranda, vessel traffic in the LDW may be summarized as follows:

- A variety of barges are used in the LDW, typically traveling at speeds of 2 to 3 knots, with a maximum speed of 5 knots. Those that are 400 feet long and 100 feet wide with 14-foot drafts travel to just upstream of the First Avenue Bridge, while those that are 286 feet long and 76 feet wide with 12-foot drafts travel no farther upstream than the South Park Bridge (approximately RM 3.3). There is relatively infrequent barge traffic upstream of RM 3.3, although General Construction Company does have a barge storage area upstream of the South Park Bridge at approximately RM 4.2.
- Ocean-going vessels are always under tug assistance in the LDW, although these vessels may also be self-propelled and do not travel farther upstream than the First Avenue Bridge (approximately RM 2.0). These vessels typically travel at a speed of 2 to 3 knots, with a maximum speed of 5 knots. These vessels are unable to turn around in the LDW, so are towed into Elliott Bay when out-bound.
- The Pilot’s Association indicated that two large vessels travel up to the James Hardie and Glacier docking areas, which are located at approximately RM 1.6. These vessels are 85 feet wide and 600 feet long, with drafts of 20 feet (unloaded) and 30 feet (loaded).
- Yachts traveling to and from Delta Marine, located near RM 4.2, range in length from 100 feet to 160 feet, with drafts of 5.5 feet to 10 feet.



An estimate of the volume of large vessels using the LDW navigation channel can be derived from the number of bridge openings of the five bridges spanning the LDW and the West Waterway. Three are located on the West Waterway: the high-level West Seattle Bridge; a railroad bridge, which remains open unless a train is traversing the waterway; and the Spokane Street Bridge. Two bridges span the LDW: the First Avenue Bridge and the South Park Bridge. Bridges are opened periodically to allow for the passage of vessels that exceed clearance heights. Bridge opening logs provide information on the number, duration, and frequency at which large vessels move under the bridges while open. Records for the Spokane Street, First Avenue, and South Park bridges were reviewed, as presented in the FS, to assess the degree to which vessel traffic varies throughout portions of the LDW (SDOT, 2006; KCDOT, 2006; WSDOT, 2006).

**Spokane Street Bridge:** The Spokane Street Bridge (downstream of the LDW near its mouth) is operated by the Seattle Department of Transportation (SDOT). Bridge opening logs for this bridge, which has a 55-foot clearance above mean high water, record the number of vessels entering and exiting the LDW through the West Waterway and every occasion the bridge is opened. For the purposes of this analysis, only openings for large motorized vessels other than sailboats were considered. Motorized vessels include tugboats and container ships. Vessels with a low clearance do not require the bridge to be opened and are not captured by bridge opening logs.

Monthly bridge openings for large motorized vessels for the period from 2003 to 2005 ranged from 93 openings in February 2005 to 261 openings in March 2003 (Table 2). The average number of monthly openings during this period was 146, or approximately 5 per day. Most of these openings were for tugboat-escorted vessels and barges, representing 75 to 140 per month, with a monthly average of 104, or approximately 3 per day (SDOT, 2006). The logs show that regular vessel traffic is spaced from 1 to several hours apart.

**First Avenue Bridge:** The First Avenue Bridge (at RM 2.0) is a drawbridge operated by the Washington State Department of Transportation (WSDOT). It has a 41-foot clearance at the center span and a 24-foot clearance at the side spans. It opened over 1,300 times annually in both 2005 and 2006, averaging less than 4 openings daily.

**South Park Bridge:** South Park Bridge (RM 3.3); also referred to as the 14th Avenue Bridge, is operated by the King County Department of Transportation (KCDOT). It has a 34-foot clearance at the center span. It was opened between 700 and 800 times annually in 2005 and 2006, approximately twice daily.

## 2.2 CONSISTENCY WITH AUTHORIZED NAVIGATION CHANNEL

Of the three pilot plot areas, only the subtidal plot area will be located in the federal navigation channel at RM 1.2. Two adjacent, half-acre areas (Figure 2) will be evaluated, one in which only ENR material has been placed and the other in which ENR material amended with AC has been

placed. The ENR material in the subtidal plot will consist of clean sand. The target thickness of the ENR and ENR+AC materials is 6 inches with at least 4 inches, and an average of approximately 9 inches placed over the existing substrate and a maximum thickness not to exceed 12 inches.

The west edge of the subtidal plot area will be aligned with and approximately 25 feet from the west edge of the federal navigation channel. Each half-acre area is about 50 feet wide by 465 feet long. The two half-acre areas will be immediately adjacent to one another and aligned in a north-south direction paralleling the federal navigation channel. The combined width of the two half-acre test plots will be 100 feet, so that the west edge of the test plot will be at approximately 30.9 feet MLLW or deeper and the east edge of the test plot at a depth of -36.8 feet MLLW (Figure 2).

Placement of ENR and ENR+AC will decrease the water depth over the one acre of the subtidal plot by an average of 9 inches (0.67 feet), with water depths in some locations along the test plot possibly being decreased by up to 1 foot. Assuming a worst-case scenario that ENR and ENR+AC will be placed at a uniform thickness of 12 inches across the entire subtidal plot, there are seven areas where the modeled depths will be -29.9 feet MLLW. The combined area of these seven locations is approximately 41 square feet. Thus, water depth after placement of the ENR and ENR+AC over the one acre area of the subtidal plot could range from -29.9 feet MLLW to -35.8 feet MLLW across the subtidal plot area. Figures 3a through 3d, which are based on the latest available bathymetry data and the assumption of a uniform ENR and ENR+AC thickness of 1 foot, depict eight cross-sectional views through the ENR and ENR+AC subtidal plots at 50-foot intervals beginning 50 feet from the north end of the proposed subtidal plots.

The available information indicate that the largest vessels using the LDW travel up to the James Hardie and Glacier docking areas, which are located at approximately RM 1.6. These two vessels are 85 feet wide and 600 feet long, with drafts of 20 feet (unloaded) and 30 feet (loaded). When loaded, it is most likely that these vessels would depart their moorages on a high tide to avoid contact with the substrate. The mean high water in the LDW is +10.24 feet MLLW (USACE, 2000); therefore at mean high water, the water depth at the shallowest points along the subtidal plot would be 40.14 feet, providing sufficient clearance between the hulls of these large vessels and the highest point along the subtidal plot.

The modeled net sedimentation rate in the LDW at the proposed location of the subtidal plot is 1.7 centimeters (0.67 inch) per year. Therefore it would require approximately 18 years for another foot of sediment to deposit over the subtidal plot. Assuming a uniform thickness of 1 foot of ENR and ENR+AC over the area covered by the subtidal plot, adding another foot of sediment deposition over the subtidal plot would result in water depths ranging from 39.1 feet to 46.0 feet at mean high water. This depth range would still provide sufficient clearance between the substrate and hulls of the largest ships currently using this reach of the LDW.

Other shallower-draft vessels, both commercial and recreational, navigating the reach of the LDW where the subtidal plot will be located are not expected to be affected by placement of the subtidal plot. Therefore, the subtidal plot is not expected to affect the usefulness of the navigation channel or to be inconsistent with the authorized navigation channel.

Placement of the subtidal plot is not expected to be injurious to the public interest.

### **3.0 TECHNICAL ANALYSIS AND ADEQUACY OF DESIGN**

The design of the pilot study was prepared by a group of expert scientist and engineers using standard scientific and engineering practices. The pilot study was designed to place the minimum amount of fill to meet the goals of the project and considered the placement precision of various types of equipment that may be used during the construction. Prior to implementation the design will require approval by Ecology and EPA.

### **4.0 REAL ESTATE ANALYSIS**

There are no real property interests required to support the proposed alteration of the navigation channel (per page 12 of EC 1165-2-216); therefore, no analysis of real estate is required.

### **5.0 ENVIRONMENTAL RISK**

A biological evaluation (BE) was prepared for the pilot study for Section 7 consultation under the Endangered Species Act. Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound steelhead trout (*O. mykiss*), Coastal/Puget Sound bull trout (*Salvelinus confluentus*), and Dolly Varden trout (*S. malma*) are listed salmonids using the LDW and were the primary species addressed in the BE. The BE assessed potential effects of the pilot study on existing environmental conditions in the LDW, listed species that use the LDW, and the critical habitats of the listed species in the LDW.

The pilot study is not expected to substantially alter existing environmental conditions within the LDW. Potential impacts on existing environmental conditions in the Action Area defined for this biological evaluation are the following:

- Placement of ENR and ENR+AC materials may result in temporary and localized increases in turbidity in the water column.
- Physical and conventional sediment characteristics (e.g., grain size and total organic carbon) within the pilot plot areas may be altered in the short term relative to those of the surrounding sediments. In the long term, the physical and conventional sediment characteristics are expected to return to current conditions by means of natural riverine processes.
- Placement of ENR and ENR+AC on sediments that are contaminated with PCBs will reduce the exposure of aquatic organisms to PCBs within those areas.
- The ENR and ENR+AC materials placed during the pilot study will be approximately 6 to 9 inches thick, with a maximum thickness of 12 inches, and are not expected to substantially alter the bathymetry in the pilot plots.

- Placement of ENR and ENR+AC materials will bury benthic habitat in the pilot plots; however, two of the pilot plot areas are subtidal, located in areas unlikely to provide preferred foraging habitat for juvenile salmonids.
- The pilot study will have no effect on access and refugia; flow, water current patterns, saltwater-freshwater mixing; marine macroalgae and macrophytes; forage fish; or ambient noise within the LDW.

A number of conservation measures and BMPs will be implemented to minimize and avoid impacts on listed species and the environment during in-water work activities:

- The completion of in-water construction activities for the pilot study will require 2 to 4 weeks. All in-water work associated with the placement of ENR and ENR+AC materials will be conducted during the authorized 2016–2017 in-water work window of October 1 through February 15 (USACE, 2012) for the LDW, when listed salmonid species are least likely to be present in the LDW.
- Construction will occur after the end of the Muckleshoot Indian Tribe's salmonid netfishery season. Construction is expected to begin in late December 2016.
- Use of submerged placement of the ENR and ENR+AC materials will decrease the spread of material outside the placement boundaries and minimize the loss of AC as the ENR+AC descends through the water column and will also prevent or minimize turbidity plumes that may result as fine material in the ENR and ENR+AC becomes suspended in the water column upon its release and descent to the sediment bed.
- Prewetting of the ENR+AC material prior to placement will minimize loss of AC during placement of the ENR+AC materials. and
- Implementation of a water quality monitoring plan during the ENR and ENR+AC material placement will assess turbidity downcurrent of the pilot plots. The water quality monitoring results will be provided to Ecology and EPA.

The following BMPs will also be implemented to minimize and avoid impacts on listed species and the environment during in-water activities:

- All mechanized equipment will be maintained in proper operating condition, with equipment inspections occurring prior to each workday. Equipment found to be leaking petroleum products or hydraulic fluid will be removed from the site for maintenance.
- Drip pads or pans will be placed under mechanized equipment to contain any potential leaks of petroleum products or hydraulic fluids.
- To the extent possible, vegetable-based hydraulic fluids will be used.
- A spill kit will be kept on work vessels to contain any potential petroleum spills that might occur.
- Ecology and the U.S. Coast Guard will be contacted immediately in the event of a spill.

- Any project-related debris or wastes will be placed in appropriate containers for off-site disposal. No project-related debris or wastes will be allowed to enter the water.
- Barges and work vessels will not be allowed to run aground on the substrate. Work barges will be held on station with spuds or anchors.

The placement of the subtidal plot within the authorized navigation channel is unlikely to adversely affect the environment within the LDW, but is expected to have a net beneficial effect through reducing exposure of aquatic biota to PCB-contaminated sediments covered by the ENR and ENR+AC in the subtidal plot area.

## **6.0 FLOODPLAIN MANAGEMENT CONSIDERATIONS**

There are no anticipated impacts to floodplains due to construction of the pilot study. The elevation of the subtidal plot will be at or below the authorized navigation channel depth. Any changes in water surface elevation due to construction of the pilot study plot will be within the range of the water surface elevations that would be expected from natural deposition of sediments within the navigation channel.

## **7.0 RESIDUAL RISK ANALYSIS**

Little, if any, residual risk is expected as a result of the proposed action. As discussed in the above sections, the placement of the proposed subtidal plot in the federal navigation channel is not expected to affect the usefulness or the functionality of the federal navigation channel, thus allowing commercial and recreational vessels to safely use the channel. Furthermore, the proposed action is not expected to adversely affect the environmental conditions within the federal navigation channel, nor is the proposed action expected to adversely affect the floodplain.

## **8.0 IMPACTS TO CORPS OF ENGINEERS OPERATIONS AND MAINTENANCE**

The placement of the fill in the subtidal plot will not impact the ability of the Corps of Engineers to maintain the authorized navigation channel. The material to be placed is comprised of sand and is easily dredged. If this reach of the navigation channel is dredged in the future, localized portions of the clean ENR material placed by this project could be incidentally removed by the navigation dredging, depending on the overdepth specifications, equipment selection, and operational controls of the navigation dredging project. However, based on the Corps dredging records presented in Table 1, this area has not been dredged in the last 30 years and it is unlikely to be dredged in the foreseeable future.

The issue discussed above would not affect USACE O&M of the federal channel. As with all ENR areas identified in EPA's LDW ROD; if future disturbances to the ENR areas affect the

protectiveness of the remedy, the Performing Parties that implement the remedy will be responsible for any needed repairs.

## **9.0 SUMMARY AND CONCLUSIONS**

The placement of the proposed subtidal plot in the federal navigation channel is not expected to adversely affect the usefulness or functionality of the channel.

## 10.0 REFERENCES

- Dredged Materials Management Program (DMMP). 2009. Determination Regarding the Suitability of Federal Operation and Maintenance Dredged Material from the Duwamish River, Section 13 – References Seattle, King County, Washington (Public Notice CENWS-OD-TS-NS-26) Evaluated Under Section 404 of the Clean Water Act for Beneficial Use or Unconfined Openwater Disposal at the Elliott Bay Nondispersive Site. October 15, 2009.
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- Riley, M.J. 2006. Personal communication between Michael Riley of SS Papadopoulos & Associates, Inc. and RETEC via memorandum regarding ship and barge traffic on the LDW. Prepared for RETEC, Preliminary Screening of Alternatives. August 11, 2006.
- Seattle Department of Transportation (SDOT). 2006. Spokane Street Bridge Opening Logs for 2003 to 2005. Provided by Dave Chew, Bridge/Structures Maintenance and Operations Manager to AECOM. November 15, 2006.
- Takasaki, K. 2006. Personal communication between Kym Takasaki of U.S. Army Corps of Engineers and Allison Hiltner, U.S. Environmental Protection Agency Region 10, regarding boat traffic information on the Lower Duwamish Waterway. August 29, 2006.
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- U.S. Army Corps of Engineers (USACE). 2010. Payment Summary for fiscal year 2009 dredging of Lower Duwamish Waterway navigation channel. April 13, 2010. USACE, Seattle District, Seattle, Washington.
- U.S. Army Corps of Engineers (USACE). 2012. Approved Work Windows for Fish Protection for All Marine/Estuarine Areas Excluding the Mouth of the Columbia River (Baker Bay) by Tidal Reference Area. Corps, Seattle District, Seattle, Washington. Available at: [http://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA%20forms%20and%20templates/Marine%20Fish%20Work%20Windows%20\(8-14-12\).pdf](http://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA%20forms%20and%20templates/Marine%20Fish%20Work%20Windows%20(8-14-12).pdf) (accessed June 2, 2015).
- Washington State Department of Transportation (WSDOT). 2006. First Avenue Bridge opening records. 2005, 2006. Provided by Williams, T., Northwest Region Bridge/Structures Maintenance & Operations Manager. December 18, 2006.

**Attachments**

Table 1 – Lower Duwamish Waterway Navigation Channel Maintenance Dredging (1986-2010)

Table 2 – Number of Monthly Lower Duwamish Waterway Bridge Opening (2003-2006)

Figure 1 – Vicinity Map

Figure 2 – Plan View of Subtidal Plot Area

Figures 3a to 3d – Cross Sections



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## **TABLES**

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**TABLE 1**

**LOWER DUWAMISH WATERWAY NAVIGATION  
 CHANNEL MAINTENANCE DREDGING (1986-2010) <sup>1</sup>**  
 Enhanced Natural Recovery/Activated Carbon Pilot Study  
 Lower Duwamish Waterway  
 Seattle, Washington

River Mile	Dredge Date		Volume Dredged
	Begin	End	(cubic yards)
4.19 to 4.38	03/11/86	03/29/86	33,637
4.38 to 4.65	06/19/86	07/15/86	126,470
4.38 to 4.65	02/24/87	03/24/87	80,160
3.97 to 4.65	02/28/90	03/30/90	127,619
3.34 to 4.65	02/06/92	03/21/92	199,361
4.33 to 4.65	03/07/94	03/28/94	57,243
4.02 to 4.48	02/22/96	03/30/96	90,057
4.26 to 4.65	02/05/97	03/31/97	89,011
3.43 to 4.65	03/11/99	06/29/99	165,116
4.27 to 4.65	01/14/02	02/09/02	96,523
4.33 to 4.75	01/15/04	02/16/04	75,770
4.27 to 4.65	12/11/07	01/10/08	140,608
4.18 to 4.65	02/19/10	03/30/10	60,371
4.00 to 4.61	12/01/11	02/09/12	152,349
4.02 to 4.03	01/28/13	02/17/13	4,640
4.03 to 4.61	12/27/13	02/01/14	67,552
-0.03 to 0.00	12/27/13	02/01/14	2,300

Note(s)

<sup>1</sup> Sources: USACE, 2005; USACE, 2010; DMMP, 2009, David Fox Chief, DMMO personal communication July 17, 2015.

**TABLE 2**

**NUMBER OF MONTHLY LOWER DUWAMISH WATERWAY BRIDGE OPENING (2003-2006)**

Enhanced Natural Recover/Activated Carbon Pilot Study

Lower Duwamish Waterway

Seattle, Washington

Year	Openings	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Average	Daily Average
<b>Spokane Street Bridge<sup>1</sup></b>															
2003	All motorized vessels	228	208	261	207	193	165	133	139	95	143	122	103	166	5.5
	Tugboat-escorted vessels and barges	93	83	124	106	140	112	105	113	76	109	84	79	102	3.4
	Openings within 1 hour	68	41	81	58	50	42	20	31	16	17	21	17	39	1.3
2004	All motorized vessels	121	105	133	139	138	145	164	115	112	149	152	152	135	4.5
	Tugboat-escorted vessels and barges	95	85	97	113	111	101	133	105	98	109	94	110	104	3.4
	Openings within 1 hour	16	9	18	23	35	26	40	8	16	23	37	23	23	0.8
2005	All motorized vessels	117	93	142	133	152	166	131	160	142	143	136	105	135	4.4
	Tugboat-escorted vessels and barges	80	77	115	113	112	131	104	132	115	103	107	75	105	3.5
	Openings within 1 hour	19	10	26	29	34	33	15	38	19	22	27	10	24	0.8
<b>First Avenue Bridge<sup>2</sup></b>															
2005	All openings	108	119	175	158	168	147	116	135	115	92	93	124	129	4.3
2006		112	83	129	145	155	142	182	146	139	125	—	—	136	4.5
<b>South Park Bridge<sup>3</sup></b>															
2005	All openings	39	63	76	47	42	59	95	76	80	53	35	46	59	2
2006		39	42	42	82	101	88	125	98	81	59	—	—	76	2.5

Note(s)

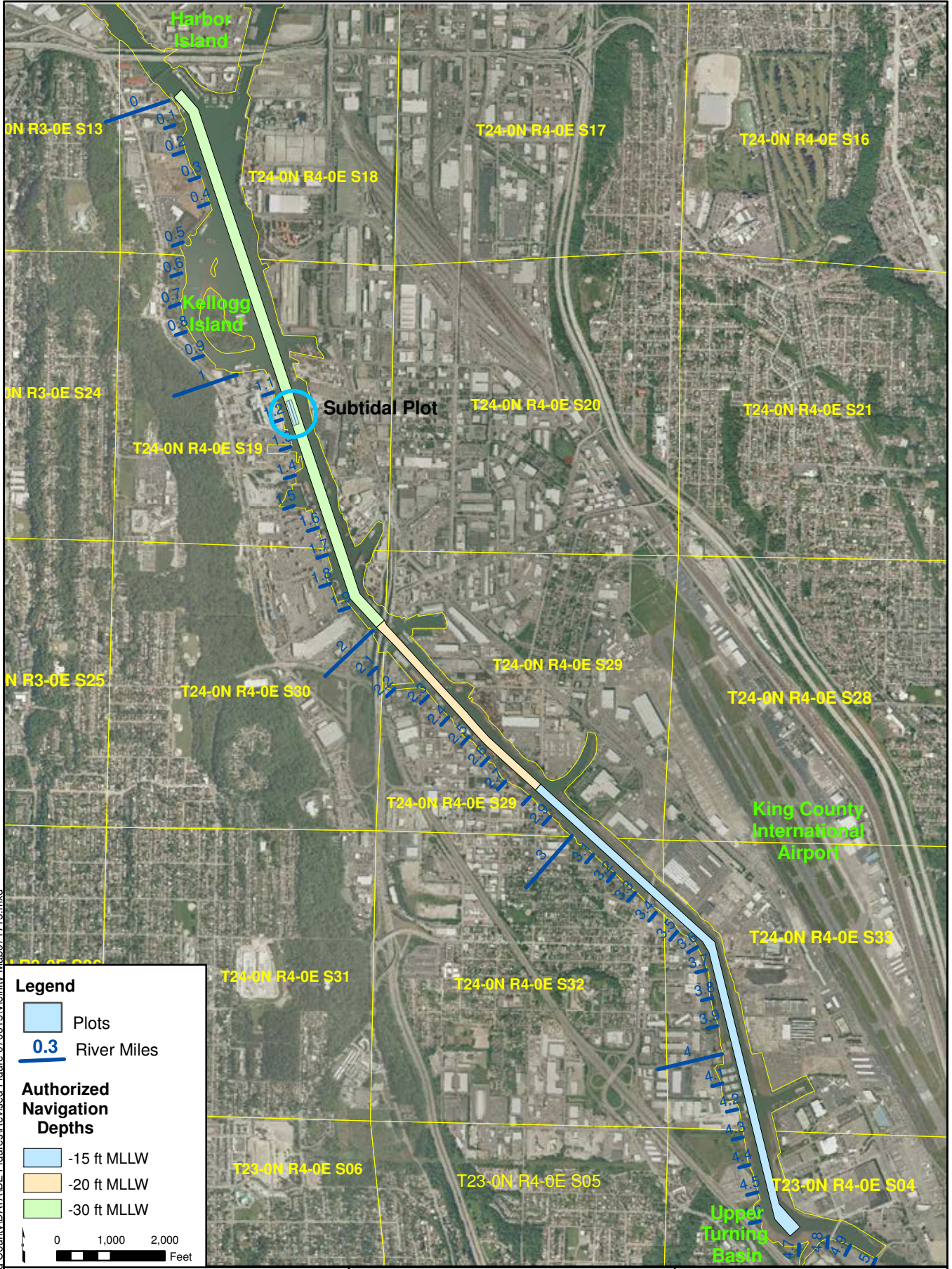
1. Source: SDOT, 2006.
2. Source: WDOT, 2006.
3. Source: KCDOT, 2006.

## **FIGURES**

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**Legend**

- Plots
- 0.3 River Miles

**Authorized Navigation Depths**

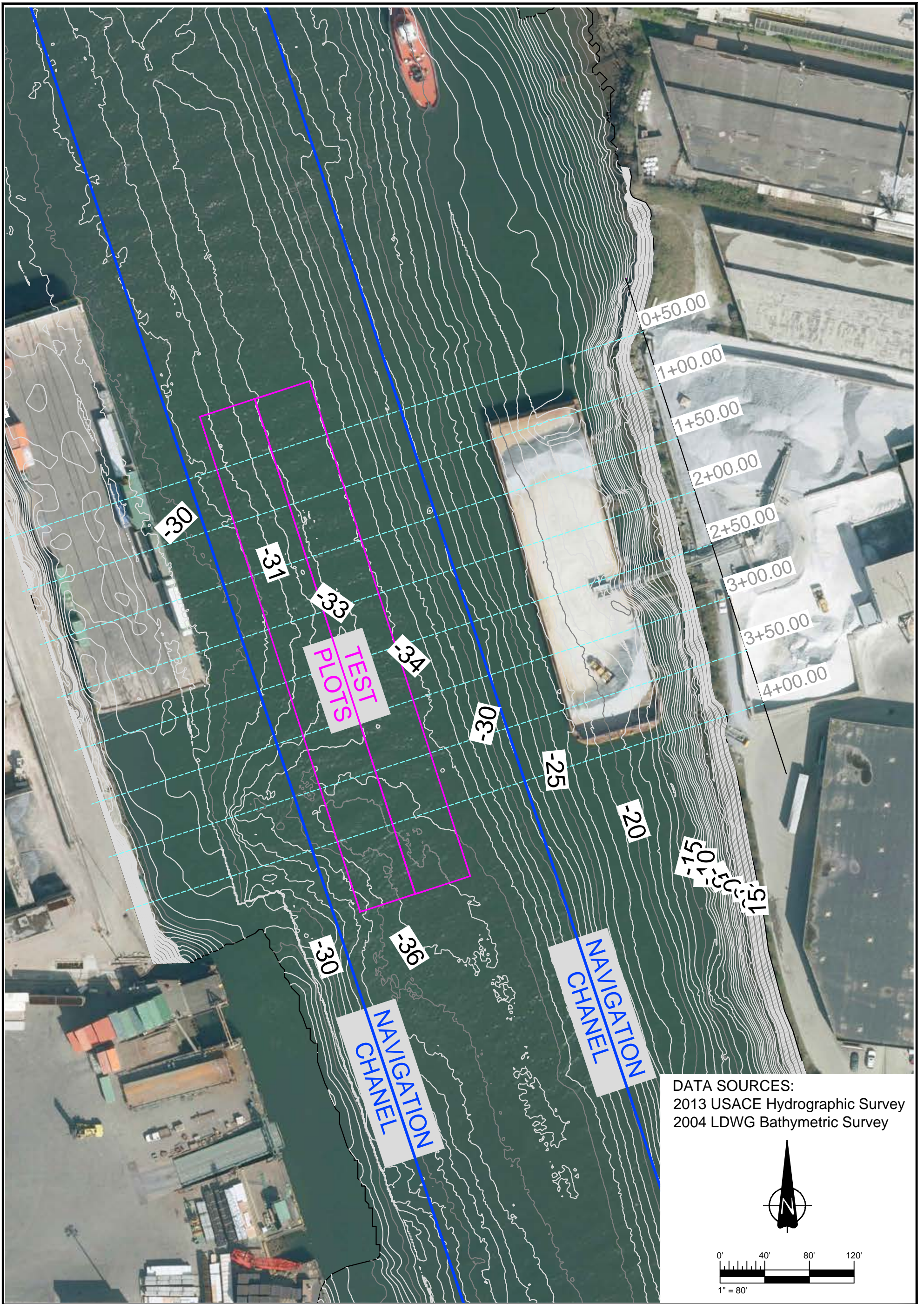
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- 30 ft MLLW

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Feet

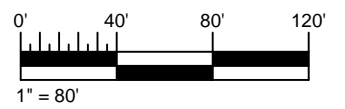
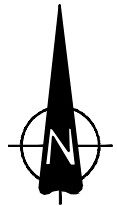


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DATA SOURCES:  
 2013 USACE Hydrographic Survey  
 2004 LDWG Bathymetric Survey



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Enhanced Natural Recovery/Activated  
 Carbon Pilot Study

DATE  
 July 17, 2015

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 Lynnwood, WA 98037

Plan View of Subtidal Plot Area

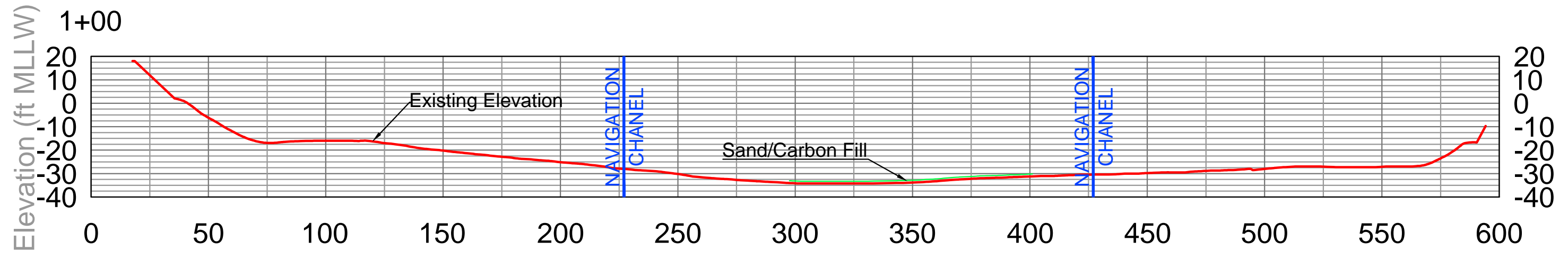
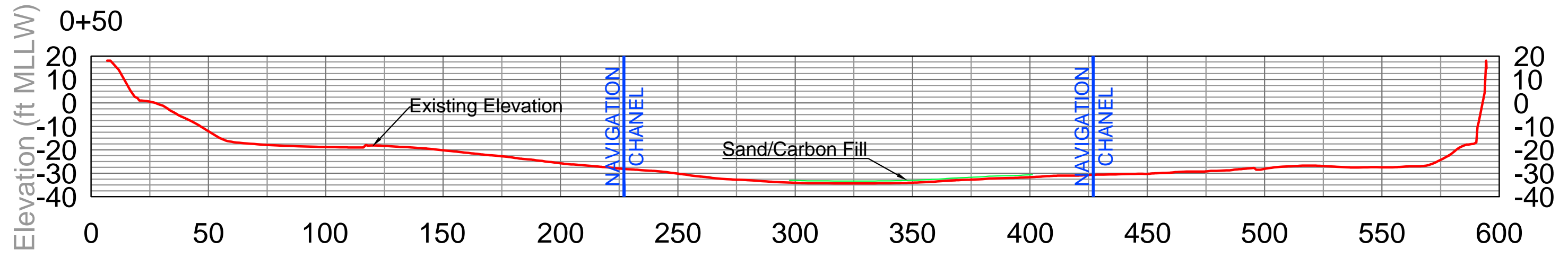
SCALE  
 1" = 80'

PROJECT NO.  
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FIGURE  
 2

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View Looking Upstream

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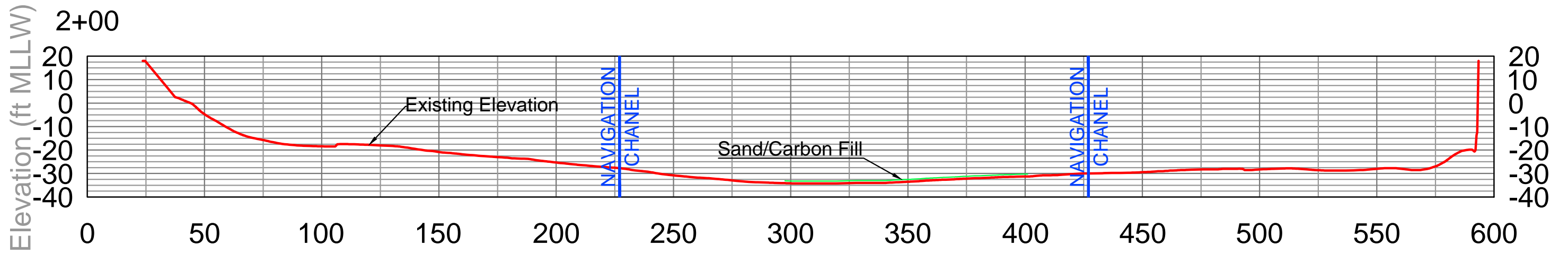
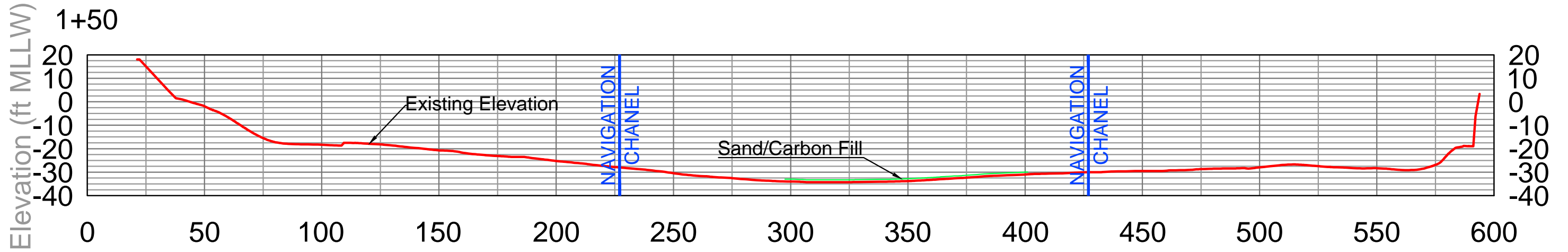


Enhanced Natural Recovery/Activated  
 Carbon Pilot Study

Cross Sections

DATE	July 17, 2015
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FIGURE	3a

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View Looking Upstream

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 Carbon Pilot Study

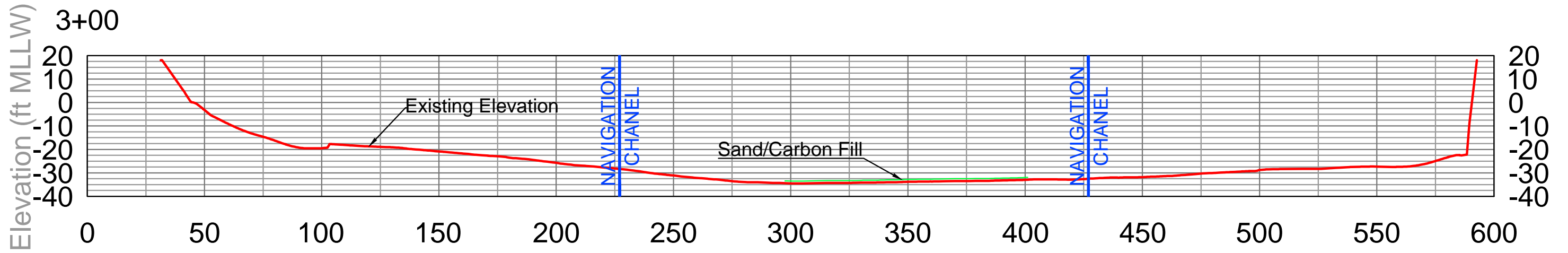
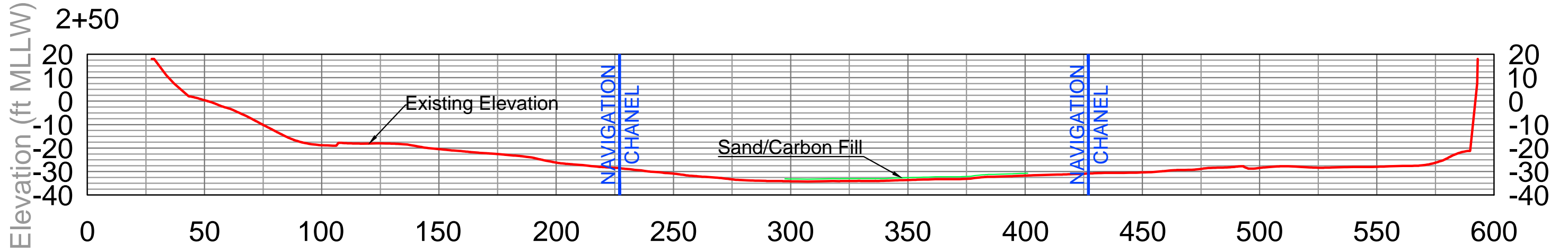
Cross Sections

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FIGURE  
 3b



View Looking Upstream

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Enhanced Natural Recovery/Activated  
Carbon Pilot Study

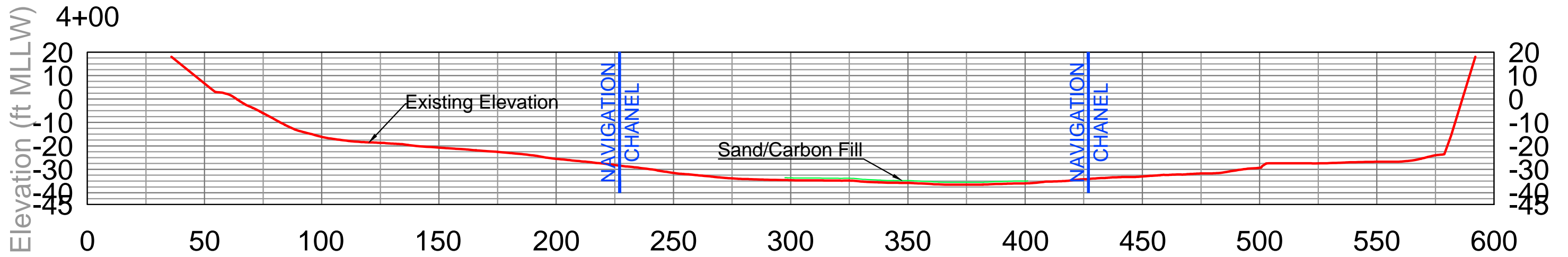
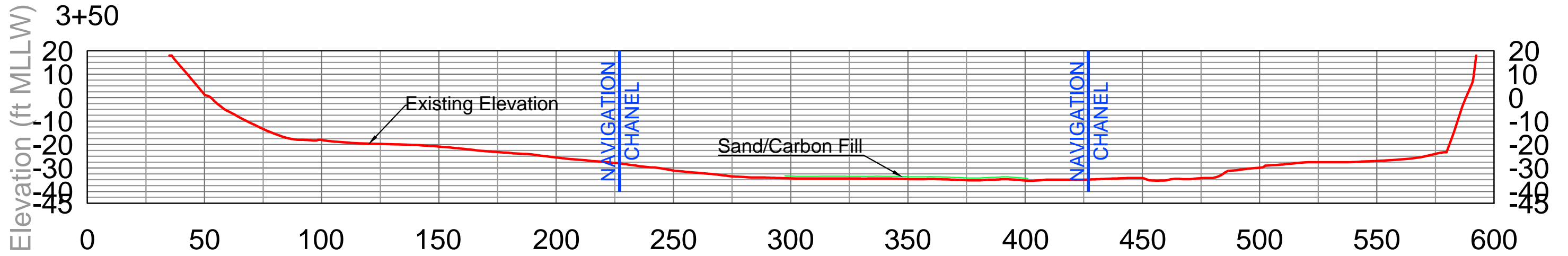
Cross Sections

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FIGURE  
3c



View Looking Upstream

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Enhanced Natural Recovery/Activated  
Carbon Pilot Study

Cross Sections

DATE  
July 17, 2015

SCALE

PROJECT NO.  
LY15160310.300.328

FIGURE  
3d