UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL
CLEANUP

October 26, 2017

Navy Facilities Engineering Command, Northwest
c/o: Ms. Pam Sargent
1101 Tautog Circle, Suite 203
Silverdale, WA 98315-1101

Re: Draft Final Fourth Five-Year Review for Puget Sound Naval Shipyard (PSNS) Complex Superfund Site, Bremerton Naval Complex, Bremerton, WA

Dear Ms. Sargent:

The Environmental Protection Agency (EPA) has completed review of the final Fourth Five-Year Review (FYR) report, signed by the Navy on October 11, 2017, for the Puget Sound Naval Shipyard (PSNS) Complex Superfund Site (Site), Bremerton Naval Complex, Bremerton, Washington. EPA's final remedy selection authority at Federal Facility National Priority List sites requires EPA to retain final authority to make protectiveness determinations. As you know, EPA and the Washington State Department of Ecology (Ecology) entered into an agreement for managing Superfund sites in Washington, dated February 23, 2000, in which Ecology has lead oversight for Operable Units (OUs) A, D and NSC, and EPA and Ecology have joint oversight for OU B. OU C is a petroleum-only OU and petroleum releases are being addressed under state authorities.

EPA's review found that the FYR report generally follows EPA's 2001 "Comprehensive Five-Year Review Guidance" and provides a thorough review of the clean-up status of each of the OUs at the Site. We appreciate the addition of Figures 4-1 and 4-2 to clarify the status of work at OU A. EPA agrees with the Navy's protectiveness determinations for the following OUs: OU B Marine, OU B Terrestrial, OU D, and OU NSC. However, as discussed at our July 18 and August 3, 2017 team meetings and described in our August 25, 2017 comments on the FYR, EPA disagrees with the Navy's determination that the remedy at OU A is Short-Term Protective. At the August 3, 2017 meeting, Ecology and the Suquamish Tribe informed the Navy that they also do not agree with the Navy's protectiveness determination for OU A.

In EPA's September 13, 2012 Memorandum, "Clarifying the Use of Protectiveness Determinations for Comprehensive Environmental Response, Compensation, and Liability Act

Five-Year Reviews," the Short-Term Protective determination is defined as appropriate for remedies where the FYR provides sufficient information that human and ecological risks are under control, and either 1) construction activities are complete and the remedy is operating; or 2) construction activities are complete, remedial action objectives have been achieved, and operation and maintenance activities are occurring. EPA does not believe that the OU A remedy meets these conditions and, therefore, EPA's protectiveness determination will be reported to Congress as Not Protective, as follows:

> *The remedy at OU A is not protective because contaminated media from the landfill is not sufficiently contained to protect human health and the environment. The erosion protection component of the OU A Record of Decision remedy (November 24, 1997), as well as subsequent fish mix applications after the Navy's 2001/2002 mitigation effort, have not been sufficient over the past ten years to maintain Ecology's minimum requirement of a three-foot thick fish mix layer to contain contaminated landfill material to ensure protectiveness of human health and the environment. Since the initial placement of fish mix material in 2002, erosion conditions were more severe than expected and the Navy replenished the fish mix material in 2008, 2010, 2015 and 2016 to prevent exposure to the underlying contaminated sediment. These short-term fish mix applications are not effectively complying with the three-foot minimum cap requirement. The following actions need to be taken to ensure protectiveness:*
>
> 1) *Proceed with the currently scheduled design to re-evaluate containment options that can achieve the protective compliance criterion of three feet over the contaminated landfill material, including identification and implementation of institutional controls since contaminant concentrations in the buried landfill materials exceed state cleanup standards and these state cleanup standards are ARARs for the site; and,*
> 2) *Evaluate whether future remedy repair activity should be formalized through an Explanation of Significant Differences or Record of Decision Amendment.*

Documents that support EPA's determination are included with this letter. These historical documents, which re-surfaced during the FYR process, describe certain activities completed within OU A, including the Charleston Beach area that was designated as a mitigation site for the Navy's post-ROD Pier D military construction project (proposed in 2000). For clarity, relevant factors identified in these documents that support EPA's determination are described below:

- In early 2000, Ecology, the Suquamish Tribe and EPA completed an expedited review of the Navy's proposed dredging and demolition work for the Pier D military construction project (non-CERCLA work) in Sinclair Inlet. In early June, the US Army Corps of Engineers issued a permit (Department of Army Permit 1998-2-01967) for this "Milcon project" to allow the Navy to quickly proceed with navigation dredging and reconstruction of Pier D. On June 15, 2000, Ecology issued their Water Quality Certification (Order No. 98-2-01967) for the project. When the certification was signed, the Navy had not resolved the required mitigation measure for the Milcon project, so

Ecology required as a condition of the certification that the Navy develop and implement a mitigation measure at a to-be-determined site. The Navy committed to this course of action. Subsequently, Charleston Beach, located in OU A, was designated as the mitigation site. During construction of the mitigation site, the Navy excavated soil and landfill material from a portion of OU A,[1] exposing a new bottom surface containing contaminant concentrations that exceeded state standards in multiple locations for mercury, copper, lead and zinc.

- Ecology addressed the new findings and the Navy's proposed design for the mitigation site in their July 31, 2001 comment letter and required a three-foot thick fish mix layer to contain contaminated media. As described in the Navy's memorandum (12/11/2007) "The Charleston Beach mitigation project is located in Zone 1 of OU A. The ROD for OU A identified containment of fill as the primary remedy. To ensure that the OU A remedy remained effective, the mitigation action removed fill and riprap from the marine environment, and a new-3-foot layer of beach mix replicating the existing beach material was placed where the fill and riprap were removed. The new beach was deemed by Ecology to be as protective of human health and the environment as the existing remedy, as long as scouring is not excessive. [Source: Final Closure Report for the Charleston Beach Habitat Restoration Project]. A summary of the relevant data was also included in the Navy's December 11, 2007 memorandum.[2]

- Following construction completion of the Charleston Beach mitigation site, erosion conditions were more severe than expected. OU A repair and stabilization measures, including one completed as part of the Navy's September 2007 CERCLA time-critical removal action, utilized fish mix applications to "restore the remedy at OU A as required by the ROD without causing a net loss of productive capacity of fish and shellfish habitat." The Action Memorandum's objective was to "repair, cap and stabilize the OU A remedy per the ROD of 16 December 1996 [note: ROD date is incorrect] without causing a net loss of productive capacity of fish habitat or infringing on the additional beach habitat that was created as part of the Pier D Mitigation project." A habitat benefit analysis to evaluate whether the habitat fix is sustainable has yet to be completed. As previously noted, the Navy replenished the fish mix material in 2008, 2010, 2015 and 2016 to prevent exposure to the underlying contaminated media.

[1] As stated in the Navy's 12/11/2007 Jefferis memo: "OU A is made up of fill material containing various contaminants laid directly over native marine soils. The fill is contained by the rock armor seawall." and "The [Milcon] Pier D Mitigation project removed landfill material from the curb seaward down to a grade that makes up the base over which the top soil and beach material was placed." The memo includes figures depicting soil data in the Charleston Beach area that exceed TCLP lead and arsenic standards.

[2] As stated in the Navy's 12/11/2007 Jefferis memo: "Of particular interest, are the locations where soil boring samples B9 and B12 were taken and analyzed during the preliminary design phase for the 2001/2002 Pier D Mitigation action. The soil samples that were taken approximately 1.5 feet below the planned depth of excavation for constructing the new beach show that the SQS for mercury was exceeded at both of these locations." The Jefferis memo summarizes the soil sampling results from the Pier D Mitigation site [collected in 2001/2002 prior to construction of the mitigation project]. The state SQS for mercury, copper, lead, and zinc were also exceeded at boring B15.

EPA will be tracking all the issues and recommendations in the FYR report that could affect protectiveness and their associated due dates in its SEMS database. EPA also will be tracking the Navy's progress toward implementing the recommendations for OU A, including the issues raised in this letter, to ensure remedy protectiveness.

Please contact Bonnie Arthur (206-553-4072) or Karen Keeley (206-553-2141) if you have further questions.

Sincerely,

Cami Grandinetti

Cami Grandinetti
Program Manager
Remedial Cleanup Program

Attachments

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

CERTIFIED MAIL

June 14, 2000

US Navy, Bremerton Naval Complex
c/o: Mr. Peter Havens
Engineering Field Activity NW
19917 Seventh Ave NE
Poulsbo, WA 98370-7570

RE: Water Quality Certification/Modification
Corps Public Notice 1998-2-01967
Navigation Dredging, PSDDA Disposal, and Reconstruction of Pier D

Dear Mr. Havens:

The above-referenced public notice for proposed work in waters of the state has been reviewed in accordance with all pertinent rules and regulations. On behalf of the State of Washington, the department certifies that there is a reasonable assurance the work proposed in the public notice will be conducted in a manner that will not violate applicable State water quality standards. This certification is subject to the conditions contained in the enclosed Order and may be appealed by following the procedures described in the Order. If you have any questions concerning the content of the Order, please contact Rick Vining at (360) 407-6944.

Pursuant to Section 307(c)(3) of the Coastal Zone Management Act of 1972, as amended, Ecology concurs with the applicant's determination that the proposed work described in the public notice is consistent with the approved Coastal Zone Management Program of Washington State

This letter also serves as the State response to the Corps of Engineers.

Sincerely,

Paula Ehlers

Paula Ehlers, Supervisor
Environmental Coordination Section
Shorelands and Environmental Assistance Program

Enclosure

cc: Corps – Jack Gossett
WDFW – Doris Small
WDNR – Ted Benson
NMFS – Rachel Friedman
USFWS – Fred Seavey
EPA – Erica Hoffman
NWRO – Sandra Lange
Suquamish Nation – Scott Pozarycki

DEPARTMENT OF ECOLOGY

In the Matter of Granting a Water Quality Certification to: US Navy @ BNC In Accordance with 33 U.S.C. 1341 [FWPCA § 401], RCW 90.48.260, and WAC 173-201A	)))))	**ORDER No. 98-2-01967** Dredging and PSDDA disposal, Bremerton Naval Complex in Sinclair Inlet. Demolition and reconstruction of Pier D

TO: Mr. Peter Havens
Engineering Field Activity NW

On April 28, 2000, a request for water quality certification was made to the State of Washington for the above-referenced project pursuant to the provisions of 33 U.S.C. 1341 (FWPCA § 401). The request for certification was made available for public review and comment by inclusion as an Erratum to Corps Public Notice No. 98-2-01967 dated March 13, 2000. The Erratum to the Public Notice was necessary in order to clarifying the role of Ecology as the agency to certify the project under Section 401 of the federal Clean Water Act and also provide concurrence under the federal Coastal Zone Management Act. The Erratum provided for a 20-day comment period.

I. Project Description. The work to be undertaken at the Bremerton Naval Complex (BNC) involves two separate by closely related actions. The first action, referred to hereafter as the military construction project or Milcon, involves the dredging of 368,050 cubic yards (cys) of sediment from the marine area of BNC for the purpose of providing greater water depths needed by aircraft carriers slated to homeport at BNC in the near future. The dredging includes portions of an access channel; the deepening of two turning basins located offshore of Piers D and C; and the deepening of berthing areas adjacent to Piers D, B and 3. The Milcon project also includes the demolition of Pier D and reconstruction of the pier to a size 90 feet wider and 160 feet longer then the existing pier. The pier replacement is needed to accommodate the larger size aircraft carriers.

The second action, referred to hereafter as the CERCLA cleanup, involves work to be done in support of a Remedial Action to cleanup the contaminated marine sediments delineated in the BNC Superfund Site. This action is being undertaken concurrent with the Milcon in order to facilitate the overall dredging effort and to minimize disruption to the berthing operations at BNC. The cleanup action is being done in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and is described in the Early Action Record of Decision and Remedial Action Design Specifications submitted to the Environmental Protection Agency (EPA). EPA is responsible for review and approval of the cleanup action to insure compliance with the substantive requirements of the Clean Water Act §401 Water Quality Criteria. EPA has drawn heavily on the State of Washington water quality standards (Chapter 173-201A WAC) in their evaluation of the cleanup action.

The Milcon project covered under state 401 certification authority includes the following three refinements to the scope of the project:

a) Refinement #1. In the Public Notice, the Corps noted that a large volume of sediments proposed to be dredged for navigation (Milcon) purposes was to undergo a retest. As further noted, the volume of material found suitable for unconfined in-water disposal could increase from (the given) 29,460 cubic yards (cys) up to a potential new volume of 309,440 (cys). Upon being retested, and after review and approval by the PSDDA agencies, a total dredge volume of 290,840 cys was determined to be suitable for placement at the PSDDA nondispersive disposal site located in Elliott Bay.

b) Refinement #2. Of the sediments to be dredged for the Milcon project, a total of 77,210 cys was found to be unsuitable for disposal at the PSDDA site. In the public notice, the description for disposal of this dredged material involved a nearshore/upland disposal facility on Navy property, with subsequent rehandling to a managed landfill in Eastern Washington. However, in the public notice, it was also noted that a confined aquatic disposal site (CAD) was being developed for the disposal of contaminated sediments removed from BNC as a result of the CERCLA clean-up action. Thus, if the CERCLA action were to proceed concurrent with the Milcon navigation dredging, as is presently planned, Refinement #2 includes the placement of the unsuitable Milcon dredge material into the CAD site, instead of to the upland site. Under this scenario, the dredging and monitoring of the unsuitable Milcon material placed into the CAD site will fall under the responsibility of EPA.

c) Refinement #3. Although not clearly stated, the inclusion of a CAD site in the public notice carries with it the consideration of how the CAD site is to be constructed. For the concurrent projects, approximately 373,000 cys of sediment must be dredged from the CAD site, which will result in an underwater pit with the capacity needed to accommodate the contaminated sediments dredged for the CERCLA cleanup and the unsuitable sediments dredged for the Milcon. Since the CAD location is in cleaner sediments, and not in the area designated as a Superfund site, consideration was directed at the option of disposing some, or all, of the CAD sediments at a PSDDA disposal site. The CAD site sediments were thus characterized under the PSDDA program and found suitable for disposal at the Elliott Bay site and/or for beneficial use. Of the total volume of CAD site sediments, 304,000 cys is slated for disposal at the PSDDA site (state 401 certification responsibility) and the remaining 69,000 cys is to be used beneficially as part of the onsite cleanup action (EPA responsibility).

II. Compensatory Mitigation. Compensatory mitigation is triggered as a result of the unavoidable impacts related to (Milcon) new dredging and expansion of Pier D. The elements of compensatory mitigation presently under consideration are referenced in three separate forms of approval or concurrence as follows:

1) Shoreline Substantial Development and Conditional Use Permit, # PL 99-0086, issued by the City of Bremerton. The demolition of Pier 8 was included as a mitigation measure as part of the shoreline development permit approved by the City of Bremerton. This same mitigation measure was factored into the Biological Opinion rendered by NMFS, whereby they determined that the Milcon project was not likely to jeopardize the continued existence of Puget Sound chinook salmon nor adversely modify their critical habitat.

2) Department of Ecology Approval of the City of Bremerton's shoreline conditional use permit, letter dated May 10, 2000. The department included three additional elements of mitigation to the City's permit:

i) The Navy is to conduct a study to assess the out-migration patterns of juvenile salmon in Sinclair Inlet. The study will include an assessment of migratory, rearing and trophic patterns from Gorst Creek through the BNC (north shore), and the relationship of such patterns to physical and biological shoreline habitat parameters. The study area will also include the south shore of Sinclair Inlet. The study is to include an assessment of the interaction of migrating juveniles with manmade structures such as piers/wharves, riprap slopes, etc and disturbed areas such as dredged berths. To increase the validity of the study results, a study design will be prepared and submitted to interested parties (NMFS, USFWS, EPA, WDFW, WDOE and the Tribe) for review and concurrence. The results of the study are to be incorporated into the most recent resource inventory of Sinclair Inlet, otherwise known as the Aquascape Plan (dated January 13, 1999).

ii) The Navy is to construct improvements to the culvert on Heins Creek (located at the Navy's railroad crossing) to provide for the unimpeded passage of salmonids. Improvements will be constructed according to specifications contained in the WDFW publication – *Fish Passage Design at Road Culverts: a Design Manual for Fish Passage at Road Crossings*, November 1999.

iii) The Navy is to remove approximately 24 wooden piling from Sinclair Inlet located adjacent to the mouth of Wright Creek. Such removal will be scheduled and accomplished in a manner to cause the least amount of disturbance to migrating salmon and the aquatic environment.

3) A Memorandum of Agreement (MOA) entered into between the Navy and the Suquamish Tribe on May 9, 2000. Appendix B of the MOA lists four potential mitigation projects that the parties agreed to consider. Three of the four projects are already included as elements of project approval, as they are the three mitigation measures stipulated by Ecology in the conditional use permit (described above). The fourth potential project is described as follows:

> (The parties will consider) *restoration that increases upper-intertidal habitat. The following examples need further definition and study as they may exceed the cost limitations or costs may greatly outweigh the benefits.*
>
> *1. Remove fill and establish habitat at the west end of the Bremerton Naval Complex area.*
>
> *2. Improve access under the rail line to a wetland near Viking Fence.*
>
> *3. Improve access to the Wright Creek intertidal area.*

4. Conclusion and 401 Condition. Mitigation for the Milcon project has not been completely resolved to date. The resource agencies and the Suquamish Tribe are of the opinion that the demolition of Pier 8 (alone) does not adequately address key fishery concerns of northern Sinclair Inlet. Nonetheless, the measure is now an element of the overall project by inclusion into the City of Bremerton's shoreline permit and as a factor in NMFS's Biological Opinion. In contrast, there is general agreement that the three measures required by Ecology's approval of the conditional use permit have greater merit in addressing fishery needs or issues in northern Sinclair Inlet.

None of the presently approved mitigation measures address the need for restoration of intertidal habitat along the north shore, which is the measure accorded highest priority by the Tribe and resource agencies. As a response to this issue, and as agreed to in the MOA, the Navy has committed to a course of action to further develop and implement a fourth mitigation measure, as defined in the MOA. The department views this commitment, and the implementation of the measure, to be a condition of certification. The measure may be one described above or one developed as a result of further coordination with the Tribe and resource agencies.

In exercising its authority under 33 U.S.C. 1341 and RCW 90.48.260, Ecology has investigated this application pursuant to the following:

1. Conformance with the state water quality standards as provided for in Chapter 173-201A WAC authorized by 33 U.S.C. 1313 and by Chapter 90.48 RCW, and with other appropriate requirements of state law.

2. Conformance with the provision of using all known, available and reasonable methods to prevent and control pollution of state waters as required by RCW 90.48.010.

In view of the foregoing and in accordance with 33 U.S.C. 1341, 90.48.260 RCW and Chapter 173-201A WAC, certification is granted to the US Navy subject to the following conditions:

1. Sinclair Inlet 303(d) Listing. Sinclair Inlet is currently listed under the 303d List as a water quality limited water body due to man-made chemicals that have been deposited in the bottom sediments at various locations within the Inlet. The dredging (removal) of contaminated sediments, included as a part of the project approved in this Order, is an action that will improve sediment quality in the Inlet. Additional mitigation measures are to be implemented during dredging and disposal to minimize the potential redistribution of contaminated sediment back into the Inlet.

2. Dredging.

a) Dredging shall be accomplished as generally specified in the *Dredging and Disposal Quality Control and Work Plan*, prepared for the Milcon/CERCLA project, dated May 9, 2000, subject to day-to-day modifications as deemed necessary and appropriate by the Navy's designated compliance inspector(s), the department or by EPA.

b) All dredging is to be done using a cable-arm or environmental clamshell bucket except when debris or consolidated sediments are encountered that require the use of a standard clamshell bucket. The use of any other type of dredging equipment will require prior approval from the department.

c) Clamshell dredging shall be conducted in a manner that minimizes the resuspension of sediments in the waterway. Each bucket grab should be complete. Stockpiling material on the bottom to achieve a "full" bucket is prohibited. Dragging the bucket to level a completed cut is permitted in clean sediments only.

d) Short-term Modification to the Water Quality Standards

1) The dredging operation may cause water quality effects that will exceed the state water quality criteria specified in WAC 173-201A. Per Section 173-201A-110, Ecology may grant a Modification to the Standards to allow for exceedances of the criteria on a short-term basis when necessary to accommodate essential activities. Sinclair Inlet is classified as Class A and thus the criteria of that class apply except as specifically modified by this order.

2) Mixing zones can be authorized to allow for temporary exceedances of certain water quality standards in state waters immediately adjacent to a permitted project. A mixing zone of 300 feet radially from the dredging operation is considered reasonably sufficient to allow for temporary water quality exceedances. Within the mixing zone, the Class A standard for turbidity is waived, as are the acute criteria applicable to chemicals-of-

concern. The Class A standard for dissolved oxygen may be exceeded but shall not be caused to drop below 4.0 mg/l. All other applicable water quality standards shall remain in effect within the mixing zone and all water quality standards are to be met outside of the authorized mixing zone.

3) The modification shall remain in effect for the entire duration of time necessary to complete the Milcon dredging operation. However, the waiver of specified standards within the mixing zone is intended for brief periods of time (such as a few hours) and is not an authorization to exceed those standards for the entire duration of construction. In no case does the waiver authorize degradation of water quality that significantly interferes with or becomes injurious to characteristic water uses or causes long-term harm to Sinclair Inlet. Nor does this modification authorize work during fishery closure periods.

e) Monitoring during the Dredging of PSDDA Suitable Dredged Material. The requirement for water quality monitoring is to insure compliance with the State water quality standards during dredging. The monitoring approach stipulated by this WQC is a tiered one with emphasis placed on more intensive sampling at the initial start of dredging. If the initial monitoring results indicate that such actions are being accomplished in compliance with this certification, then subsequent monitoring may be reduced or eliminated altogether. An exceedance of a water quality criteria may result in corrective action depending upon the degree of the exceedance and/or the risk posed by the exceedance to beneficial uses of the water body.

The following monitoring requirements apply to the initial dredging of clean sediments from the Milcon project, if such dredging occurs prior to the dredging of clean CAD sediments. If clean CAD site sediments are dredged before Milcon, the department will review the results of the CAD monitoring (required by EPA) to determine if monitoring will also be required during the dredging of clean Milcon sediments.

1) Monitoring is required twice a day for the first six days of continuous dredging operation. Monitoring shall be done once during a slack tide and once during a strong ebb or flood tide cycle. Two locations shall be sampled in the receiving waters; one at the mixing zone boundary (300 feet) and one at the mixing zone midpoint (150 feet). A baseline condition shall be established 24-48 hours prior to the start of dredging by sampling the water column in the same manner as above in the general area to be dredged.

2) At the three monitoring locations, water samples shall be taken near the surface (2 -3 feet below), mid-depth, and near bottom (3.0 feet above). However, samples taken within the mixing zone and at the mixing zone boundary shall be adjusted within the depth range to target the turbidity plume, which shall be tracked hydro-acoustically. If no distinct turbidity plume can be identified, water samples shall be taken in the area

immediately downcurrent of the dominant tidal flow and shall be obtained at the standard depths (i.e., surface, mid-depth, and near bottom).

3) Water samples shall be analyzed for dissolved oxygen (DO), turbidity, and total suspended solids. If DO is determined by a DO meter instead of the Winkler method, calibration of the instrument and probe shall be performed across the range of DO levels likely to occur in the marine waters. Documentation of calibration shall be included in the report sent to Ecology.

4) The results of the monitoring will be faxed to Ecology as soon as they become available, Attn: Rick Vining at (360) 407-6904 or emailed at: rvin461@ecy.wa.gov.

f) Monitoring during the Dredging of Milcon/PSDDA Unsuitable Dredged Material.

The monitoring associated with the dredging of the 77,210 cys of unsuitable Milcon sediments is covered in the WQC issued by EPA dated June 13, 2000.

g) Compliance. If dredging operations are found not to be in compliance with the provisions of this order, or result in conditions causing distressed or dying fish, the operator shall immediately take the following actions:

1) In the event of exceeding the water quality criteria for turbidity or DO, a second set of water measurements should immediately be taken in the same general location as the earlier reading, as well as from an appropriate reference site. If the second measurements confirm the exceedance, the cause of the water quality problem should be assessed and appropriate measures taken to correct the problem and/or prevent further environmental damage.

2) If the problem persists, cease operations at the location of the violation

3) In the event of finding distressed or dying fish, the operator shall collect fish specimens and water samples in the affected area and, within the first hour of such conditions, make every effort to have the water samples analyzed for dissolved oxygen and total sulfides. The department may require such sampling and analyses before allowing the work to resume.

4) Notify Ecology (water quality violation) and/or WDFW (fish kill) of the nature of the problem, any actions taken to correct the problem, and any proposed changes in operations to prevent further problems.

3. Dredged Material Disposal at a PSDDA Site.

a) The disposal of dredged material at the Elliott Bay in-water site shall be by bottom dump scow only, unless another disposal method is approved by the DMMP agencies. Bottom-dump scows shall be in good working order; the seals should be in good condition; and the hydraulics must be sufficient to retain the load without failure.

b) The disposal of dredged material is authorized only within the bottom footprint prescribed by the DMMP for the disposal site.

c) All visible debris (larger than 2 feet in any dimension) shall be removed from the dredged sediment prior to placement at a PSDDA disposal site. Similar sized debris found floating in the dredging or disposal area shall also be removed. All debris shall be disposed of at appropriate upland locations.

4. Dredged Material Disposal to an Upland Site. Although not the preferred option, the disposal of unsuitable dredged material could be to a near-shore rehandling site, as indicated on Sheet 9 of 9 of the Corps public notice. If so, this location will serve as the site to offload and process the 77,210 cys of Milcon dredged material found unsuitable for in-water disposal. The dredged material is to be offloaded from flat-topped barges onto the asphalt deck surface, mixed with a drying agent, placed under cover, and then removed to rail cars to be transported to a final landfill site. This operation is subject to the following conditions:

a) During both filling and unloading, the spillage and runoff from flat-topped barges shall be controlled to minimize the discharge of turbid runoff water. The sides and ends of the barge shall be rigged with suitable board structure to contain the dredged material. Straw bales, or other comparable filtration medium, shall be lashed to the outside of the sideboards to provide filtration of runoff water. These BMP measures shall be inspected periodically to insure they are effective and are adequately maintained.

b) Dredged material shall be properly managed so that it is not discharged back into Sinclair Inlet during the rehandling operation. Proper erosion control measures shall be in place, prior to use of the rehandling site, to prevent dredged material from being carried into the Inlet by stormwater runoff. Measures shall include, but are not limited to, placing fabric fences and hay bales between storage areas and the Inlet. All erosion control structures shall be inspected and maintained regularly to ensure they are in proper working order. Adjustments to planned erosion and sediment control may be necessary to successfully control off-site movement of dredged material.

c) A separate handling area shall be set aside, which does not have any possibility of draining to surface waters, for the wash out of trucks used to transport dredged material. All wash out water shall be collected and treated as effluent water, as described below.

b) Effluent Control and Monitoring. As a part of the rehandling operation, effluent water will be generated from the dredged material itself, as it de-waters, and from rainwater that falls onto the handling site. All of this water shall be collected and routed to storage (Baker) tanks where it shall be filtered prior to discharge back into the marine waters of Sinclair Inlet. Because of the contaminants in the dredged material, any water discharged from the rehandling site falls under the category of a point source of discharge and requires compliance comparable to an NPDES permit. Thus, the following conditions pertain to any effluent waters discharged from the site:

1) Prior to the initial discharge of treated effluent water into Sinclair Inlet, the contractor shall obtain a representative sample of the water and have it analyzed for all of the contaminants that caused the dredged material to fail PSDDA testing and for which there is a corresponding acute criteria listed in the Water Quality Standards (refer to Section 173-201A-040, Toxic Substances). The analysis shall include the levels of contaminants dissolved in the water column and that which is associated with any turbid or suspended solids contained in the water sample.

2) The results of the initial testing shall be provided to the department, c/o Rick Vining at (FAX 360-407-6904).

3) No discharge shall be allowed if any of the above contaminant levels exceed the acute criteria. In such case, the possible options for managing the effluent are to provide additional treatment to the effluent and test again or contact the City of Bremerton about the possibility of discharging effluent waters to the sanitary sewer system.

4) If none of the contaminants exceed the acute criteria, but any one contaminant exceeds the chronic criteria, the effluent may be discharged continuously for a period of three days to waters of the state; kept in storage on the fourth day; and then discharged continuously for another three days. This manner of discharged shall be followed as long as any of the chronic criteria are exceeded.

5) Because of the potential variability of contaminant levels in the sediments to be dredged, weekly testing of the effluent will be required for the duration of the upland disposal operation.

5. Spill Prevention and Control.

a) During dredging and/or Pier D demolition/reconstruction, any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited.

b) Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., on construction equipment shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters. Proper security shall be maintained to prevent vandalism.

c) In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of any spilled material and used cleanup materials.

d) Spills into state waters, spills onto land with a potential for entry into state waters, or other significant water quality impacts, shall be reported immediately to the department's Northwest Regional Office at (354) 649-7000 (a 24-hour phone number).

6. Notification. The department shall be notified at least 24 hours prior to the start of Milcon dredging and Pier D demolition. Contact Rick Vining @ (360) 407-6944.

7. General Conditions.

a) This certification does not exempt and is provisional upon compliance with other statutes and codes administered by federal, state, and local agencies.

b) The US Navy (applicant) shall be considered out of compliance with this certification if:

1) the project is constructed and/or operated in a manner not consistent with the description contained in the Corps' Public Notice.

2) Five years elapse between the date of the issuance of this certification and the start of construction and/or discharge for which the federal license or permit was sought. However, the expiration date may be extended by the department at the request of the permittee.

3) The information contained in the Public Notice is voided by subsequent submittals to the federal agency. In which case, the permittee must reapply for certification with the updated information.

c) Ecology retains continuing jurisdiction to make modifications hereto through supplemental order, if it appears necessary to further protect the public interest.

d) Copies of this Order shall be kept on the job site and readily available for reference by Corps of Engineers personnel, the construction superintendent, construction managers and foremen, and state and local government inspectors.

8. Liability. Failure by the permittee, or designated contractors, to comply with any provision of this Order shall be liable for a penalty of up to ten thousand dollars per violation for each day of continuing noncompliance.

9. Appeal Procedures. Any person aggrieved by this Order may obtain review thereof by appeal. The applicant can appeal up to thirty (30) days after receipt of this Order, and all others can appeal up to 30 days from the postmarked date of this Order. The appeal must be sent to the Washington Pollution Control Hearings Board, PO Box 40903, Olympia WA 98504-0903. Concurrently, a copy of the appeal must be sent to the Department of Ecology, Enforcement Section, PO Box 47600, Olympia WA 98504-7600. These procedures are consistent with the provisions of Chapter 43.21B RCW and the rules and regulations adopted thereunder.

DATED 6-15-00 at Lacey, Washington

Paula Ehlers

Paula Ehlers, Supervisor
Environmental Coordination Section
Department of Ecology
State of Washington

Lavoie, Roland P (EFANW)

From: Kienholz, Sandra L (EFANW)
Sent: Wednesday, August 01, 2001 9:13 AM
To: Lavoie, Roland P (EFANW)
Cc: Shanti Montgomery (E-mail)
Subject: FW: High Priority - Charleston Beach Mitigation Project

Ron,
Here is Ecology's opinion. Basically, they are ok with the design as long as we are sure that the fish mix will not be moving too much. I think a visual monitoring program is a must.

Today is pretty busy, but I'll try to be at my desk around 10:30 am in case you and Scott call.

Sandy

(b) (6)

-----Original Message-----
From: Yee, Chung K. [mailto:cyee461@ECY.WA.GOV]
Sent: Tuesday, July 31, 2001 8:20 AM
To: 'Kienholz, Sandra L (EFANW)'
Subject: RE: High Priority - Charleston Beach Mitigation Project

Sandy,

Presented below are Ecology's comments on the Charleston Beach Mitigation Project.

After reviewing the boring sample data, Ecology's concern is that sediment having historical contamination at levels greatly exceeding standards could be exposed under the current mitigation plan. If the Navy plans to carry out the mitigation project on this beach, measures will have to be taken to ensure that construction does not result in degradation of sediment quality. Ecology agrees with the three-foot thick fish mix layer to contain contamination. However, in keeping with the Asarco's remediation plan, Ecology stresses the three-foot thickness must take into account any anticipated losses after placement. Furthermore, very hot spots could require additional measures. Ecology will leave that to the design engineers. The Sediment Management Standards (Chapter 173-204 WAC), however, are clear on antidegradation.

Ecology suggests the mitigation project itself, might be best addressed by the tribe and Fish and Wildlife.

Please let me know if you have any questions.

Chung

PS. I asked about the fish mix sampling program because the Navy is in effect defining how clean is clean. I think it may be a tough issue.

-----Original Message-----
From: Kienholz, Sandra L (EFANW)
[mailto:KienholzSL@efanw.navfac.navy.mil]
Sent: Monday, July 30, 2001 4:25 PM
To: Yee, Chung K.
Subject: RE: High Priority - Charleston Beach Mitigation Project

Chung,

The general idea is to keep from putting contaminated materials on the beach. We will use the data to accept or reject delivery of the fish mix. Shanti at FWENC will be adding a few words about the sampling of the fish mix, and what the results will be compared to.

The Mitigation Board is meeting on Thursday to decide if this project is still worthy of consideration. The show stopper will be if there is some reason that we are creating a new pathway to the environment for the contaminants that are currently safely underneath the ground. I am anxiously awaiting Kathy's opinion about the SQS results. I think that mercury might be the only contaminant worth worrying about, and all the hits are below the 3 mg/kg cleanup level for OUB Marine. I could be convinced that the 3 feet of fish mix in the design will be adequate to contain and preserve the integrity of the remedy, but I would like your opinion.

Thanks for acting so quickly on this,
Sandy

-----Original Message-----
From: Yee, Chung K. [mailto:cyee461@ECY.WA.GOV]
Sent: Thursday, July 26, 2001 2:50 PM
To: 'Kienholz, Sandra L (EFANW)'
Subject: RE: High Priority - Charleston Beach Mitigation Project

Just received the draft work plan. I have questions on the imported fish rock mix sampling program. What is the purpose and what will the Navy do with the data? Will you be comparing the results to some standards? Thanks.

Kathy is reviewing the data, and we will forward you our comments by Wednesday.

-----Original Message-----
From: Kienholz, Sandra L (EFANW)
[mailto:KienholzSL@efanw.navfac.navy.mil]
Sent: Wednesday, July 25, 2001 10:12 AM
To: Yee, Chung K.; Bragdon-Cook, Kathy
Subject: High Priority - Charleston Beach Mitigation Project
Importance: High

Chung,
Per our telephone conversation yesterday, I am requesting your immediate help.
Kathy, you are being copied per Chung's request because of the sediments issue:

Background: Charleston Beach is part of OUA at the shipyard. The mitigation project is a result of the MILCON job at Pier D, and the goal is to increase intertidal habitat. The OUA Record of Decision did not identify any active measures for Charleston Beach; i.e. what's already in place is considered protective of human health and the environment (risk is from soil and groundwater pathways - sediments were to be considered in OUB). We are aiming for a September construction of this project.

Status of Design:
1. A Draft Site Work Plan was issued June 1, 2001. You should receive a copy today by FedEx. I think Amy planned to send the final for Ecology review, but we now need to move faster on the schedule.

2. Additional in-situ soil sampling was done in June to evaluate the excavated soil and to evaluate the fill material that will become exposed during excavation. The Draft Site Work Plan was written with the assumption that everything would prove to be "clean". That is not the case, and we are trying to get a Final Work Plan approved in time to meet our September construction start. The sampling results were presented at the last Mitigation Board meeting and some design changes are being considered.

3. Regarding excavated material: the excavated soil west of boreholes B6 and B7 will designate as hazardous because of TCLP lead. The attached spreadsheet has the disposal data summary tables. [Note that the highest result is 54.8 mg/L. Applying the "times 20" rule results in an estimated total lead of 1100 mg/kg. The MTCA C industrial clean up level is 1000 mg/kg.]

Because of increased disposal costs, the general consensus at this time is to revise the design in the Draft Work Plan, working east to west, and stopping the work when we run out of money. The attached figure depicts the cut-off point on the revised Site Work Plan design (see the dashed line located between boreholes B5 and B7).
<<Summary of disposal data.xls>> <<Design revised.pdf>>

4. Regarding the exposed fill material: there are several exceedances of SQS at all the boreholes. See attached spreadsheet. The workplan calls for several feet of fish mix as "containment" on the new soil surfaces. The Mitigation Board is currently under the assumption that the design is protective of the environment because the sediment containment is addressed by the depth of fish mix. Also, in the event that the fines are sacrificially transported, the coarser and larger fraction in the fish mix will remain to provide stable protection.
<<SQS Table _ final 071701.xls>>

Action: Please review the attached materials. I would like to hear any comments your might have on this project. Specifically, I would like your opinion on the future SQS exceedances and the protectiveness of the proposed design.

I need your comments by COB Wednesday August 1 in order to discuss at the Charleston Beach Mitigation Board on August 2. I know this is short turnaround, and I apologize profusely.

Thank you very much,
Sandy

Engineering Field Activity
19917 7th Ave. NE
Poulsbo WA 98370
(360) 396-0012
kienholzs1@efanw.navfac.navy.mil

PSNFF
11.6.2

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND NORTHWEST
1101 TAUTOG CIRCLE
SILVERDALE, WA 98315-1101

5090/BNC OU A 15.1
Ser EV4SJ/5423
September 13, 2007

Ms. Nancy Harney
U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Dear Ms. Harney:

Enclosed for your records is one copy of the Action Memorandum for OU A Charleston Beach at Bremerton Naval Complex, Bremerton, WA, dated September 2007.

Please note that the draft Work Plan will be ready for your review on October 26, 2007, and we plan to schedule a review conference call during the week of November 5, 2006.

If you have any questions regarding this document, please contact me at (360) 396-0053 or by email at Suzanna.Jefferis@navy.mil.

Sincerely,

SUZANNA M. JEFFERIS, P.E.
Remedial Project Manager

Enclosure

Copy to:
D. Leisle, PSNS & IMF

ACTION MEMORANDUM

OU A CHARLESTON BEACH
BREMERTON NAVAL COMPLEX

September 2007

Enclosure (1)

PURPOSE

This Action Memorandum presents the U.S. Navy's decision to perform a time-critical removal action for Operable Unit (OU) A, Bremerton naval complex (BNC), Bremerton Washington, in compliance with Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act (CERCLA/SARA), the National Contingency Plan (NCP) 40 Code of Federal Regulations (CFR) 300, and under authorization of Executive Order 12580, and to the extent possible the Model Toxics Control Act, Washington Administrative Code (WAC) 173-340.

REMOVAL ACTION OBJECTIVES

This time critical removal action (TCRA) is intended to reduce the likelihood of contact with the land fill debris and contaminated soils at OU A, by restoring the OU A armor rock remedy. The removal action will thereby reduce the potential risk to human health and the environment. Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the removal action, may present an imminent endangerment to public health, welfare, and or the environment. This removal action strategy is expected to minimize additional remediation costs, at a reasonable cost, that may otherwise occur if no removal action were taken. This removal action is required to meet the requirements of the Record of Decision (ROD) for OU A.

This TCRA will also include a one time restoration of fish mix on the beach below the armor rock remedy.

The primary goals of the remedial actions are to:

- Minimize any existing risk to occasional site users/workmen from buried landfill debris.
- Restore the remedy at OU A as required by the ROD without causing a net loss of productive capacity of fish and shellfish habitat.

DESCRIPTION OF REMOVAL ACTION

The objective is to repair, cap, and stabilize the OU A remedy per the Record of Decision (ROD) of 16 December 1996 without causing a net loss of productive capacity of fish habitat or infringing on the additional beach habitat that was created as part of the Pier D Mitigation project. This will be accomplished by the following actions:

- Build a sloped armor rock wall along the Charleston Beach Shoreline in the area between to armor rock wing wall and the sheet pile retaining wall. This distance is approximately 120 feet between STA 3+00 and 4+20
- Match the slope/shape, strength, and material of the existing armor rock wall that continues to the South west along the shore of OU A. This armor rock is approximately 4 feet deep at the top and 4 feet deep at the base.

- Place the leading edge of the toe of the armor rock wall at the extreme high water level (EHWL) contour. Design the toe in such a manner to prevent undermining and erosion of the armor rock wall. Restore the beach at the toe of the armor rock.
- Cut back the existing escarpment as needed to allow for placement of the armor rock. Characterize waste and dispose of appropriately.
- Provide an appropriate transition at both ends of the new armor rock retaining wall to prevent further erosion that might undermine the armor rock.
- Restore the parking lot and curb to match existing and to transition smoothly with the existing structures i.e. curb, pavement structure and type, and the sheet pile wall. Fill in disturbed areas with matching vegetation or soil to provide smooth transitions.
- Install fish mix to specifications similar to the Pier D Mitigation project. Study and provide options for fish mix stabilization.

ALTERNATE ACTIONS EVALUATED

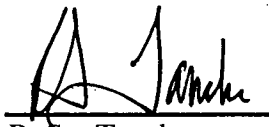
Two alternatives were considered. The first was to restore the remedy per the Pier D Mitigation i.e. soft beach with no hard protection for the land fill. This option has failed in the past, so it was not chosen. Also, the OU A ROD requires "erosion protection (additional riprap or stabilized cobble /gravel)". The second was to continue the sheet pile wall between the existing sheet pile wall and the rock wing wall. This option was not chosen because of the high cost and the risk for increased cost involved with placing sheet pile.

REMOVAL ACTION COST AND SCHEDULE

The estimated capital cost for placement of the armor rock is [redacted] The estimated capital cost for the one time placement of fish mix is [redacted] Work is scheduled to be completed approximately 9 months after commencement of this removal action.

APPROVAL

The selected removal action is protective of human health and the environment, complies with federal and state requirements, is cost effective, and is consistent with all reasonable final remedies.



9/5/07

R. S. Tanaka Date
Captain, U.S. Navy
Commanding Officer, Naval Base Kitsap

STATEMENT OF WORK -
07 Time Critical Removal Action, Bremerton naval complex, OU A Charleston Beach

Contract Number N68711-04-D-1104 TO: XX
Date: July 5, 2007
Revised: July 23, 2007
Revised: August 14, 2007

NAVAL FACILITIES ENGINEERING COMMAND NORTHWEST
1101 TAUTOG CIRCLE SUITE 203
SILVERDALE WA 98315 1101

PERFORMANCE WORK STATEMENT
07 TIME CRITICAL REMOVAL ACTION,
BREMERTON NAVAL COMPLEX (BNC), OU A CHARLESTON BEACH

1.0 INTRODUCTION

NAVFAC Northwest is acquiring environmental services for the purpose of conducting a Time Critical Removal Action (TCRA) at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility, Bremerton site, FISC, and at Naval Base Kitsap, at Bremerton. The collective area occupied by these Navy commands is hereafter collectively referred to in this task order as the Bremerton naval complex (BNC). The goal of this TCRA is to repair, cap, and stabilize the Operable Unit A (OU A) remedy per the Record of Decision (ROD) of 16 December 1996.

2.0 BACKGROUND

The initial fill at OU A was placed in the 1940's. The site was brought to its present configuration by the placement of additional fill in 1956 and 1971. Beginning in the 1950s, copper slag (grit) and sand blast materials were deposited at OU A.

The ROD documents for Remedial Action (RA) at the BNC, OU A, Missouri Beach Parking Lot, and Charleston Beach was signed on 16 December 1996. The selected OU A remedy included actions to control erosion, upgrade site paving, enhance marine and terrestrial habitats, develop and implement institutional controls, and conduct a groundwater and remedial action monitoring program for a period of five years with a review of remedial measures every five years. The OU A remediation was implemented by constructing (or confirming that the existing rip-rap was protective) a shoreline protection system and paving the Missouri Parking lot. Construction began in January 1998 and was completed in August 1998.

Between December 2001 and April 2002, a mitigation action was conducted to increase the upper inter-tidal habitat at Charleston Beach. This mitigation project was done as an offset for the Pier D MCON construction. Part of this mitigation included removing the rip-rap armor wall that comprised part of the OU A ROD remedy and replacing it with a soft bank sloped beach covered with fish mix gravel. This was done approximately between STA 4+20 and 3+00. Washington Department of Ecology deemed that this soft beach was protective per ROD for OU A as long as "scouring is not excessive" (Ref. 3 page 1-5).

As of April 2007 this section of soft beach has been scoured so that the fish soft embankment that makes up the edge of OU A has been eroded back into the fill thus releasing fill debris onto the beach (copper slag, contaminated soils and other metal debris). The OU A remedy per the ROD has failed. See the Attached photographs for details. As-Built 2002 is the remedy that the Washington Department of Ecology deemed as protective. April 2007 is the same area after severe scouring that has caused the remedy to fail.

The current situation at Charleston Beach has been identified in the Second Five –Year Review Bremerton naval complex (Ref. 4).

3.0 SCOPE OBJECTIVE

The objective of this task order is to repair, cap, and stabilize the Operable Unit A (OU A) remedy per the Record of Decision (ROD) of 16 December 1996 and to do it in such a way that the repair does not infringe on the beach area

Enclosure (2)

below MHHWL or on the fish habitat per the agreements made by the Navy as part of the Pier D Mitigation. This scope will also include two pre priced options for replenishing the fish mix along this section of the beach after the remedy repair is constructed.

4.0 APPLICABLE DIRECTIVES AND DOCUMENTS:

The contractor shall adhere to the following documents in accordance with paragraph 5.0 - Performance Requirements		
Reference #	**Title**	**Date**
1	Final Record of Decision Operable Unit A Missouri Parking Lot and Charleston Beach	December 1996
2	Addendum to Biological Assessment Nimitz Class Aircraft Carriers Home-porting and Maintenance Berth Improvements BNC	2 November 2001
3	Final Closure Report Charleston Beach Habitat Restoration Project BNC	28 June 2202
4	Second Five-Year Review BNC (slated for signature by the Navy (Captain Tanaka) by 30 October 2007)	August 2007
5	Final Site Work Plan Charleston Beach Habitat Restoration	29 October 2001

5.0 PERFORMANCE REQUIREMENTS

The contractor shall provide all applicable plans, data, and reports (i.e. QC, SHSP, and Electronic Submittals) in accordance with Section C, General Contract Requirements, of the Basic Contract, plus provide the technical effort in the work areas listed below in accordance with the tasks and their associated schedules as described below.

The contractor shall complete all work in accordance with the performance requirements indicated in Table 5.1: "Performance Requirements Summary". The contractor shall provide the technical effort in the work areas listed below in accordance with the tasks and their associated schedules as described below.

TASK 5.1: Project Management
TASK 5.2: Project Plans (Letter Report Work Plans and Health, Safety Plan, and QC)
TASK 5.3: Biological Assessment (BA)
TASK 5.4: Design/Build Specifications for OU A Remedy Repair
TASK 5.5: Sampling and Analysis and Waste Disposal
TASK 5.6: Closure Report
TASK 5.7: Fish Mix Replenishment Options 1 and 2

Task 5.1 Project Management

Provide project management for the duration of this project. The contractor shall conduct all necessary program management actions to ensure this task order remains on schedule. Management activity includes routine project administration, correspondence, scheduling, cost tracking, budgeting, and preparing monthly invoices. Included in this task are such items as mobilizing the project team, providing on-going team coordination, planning, scheduling, and maintaining communications with the Navy. The program manager is responsible for notifying NAVFAC NW Remedial Project Manager (RPM) of any problems that arise and to identify corrective actions. The contractor shall provide the personnel, equipment, materials, and facilities to accomplish the required tasks outlined in the Statement of Work and shall comply with the Navy Installation Restoration Manual and appropriate federal, state, and local regulations.

The period of performance for this project is estimated at 13 months. This task does not include project management effort for the pre priced options in Task 5.7.

Task 5.2 Project Plans (Work Plan, Health, Safety Plan, and Quality Control Plan)

The contractor shall prepare internal draft, draft, and final Project Plans to include the Work Plan, health and Safety Plan, Sampling and Analysis Plan, Spill prevention Plan for heavy equipment, and the Quality Assurance Plan in accordance with the schedule in 6.0. The contractor shall provide a written response to comments for each draft project plan submitted. The Work Plan will include all the design build specifications for this project that are required in Tasks 5.4 and 5.5. This task does not include Project Plan effort for the pre priced options in Task 5.7. Project plans from Task 5.7 will be included as an appendix to the Task 5.2 project plans.

Task 5.3 Biological Assessment

The Government will provide the Biological assessment (BA). The contractor shall ensure that the results of the BA are incorporated into the final Project Plans. The government will conduct all necessary outside agency (NOAA and USFWS) coordination to receive approval of the BA prior to the start of field work. The contractor shall coordinate with the government biologist to ensure the final BA is incorporated appropriately into the Project Plans. This task does not include Biological Assessment effort for the pre priced options in Task 5.7.

Task 5.4 Design Build Specifications for OU A Remedy Repair

- Construction shall be completed no later than March 1, 2008.
- Care shall be taken to prevent any petroleum products, chemicals, or other toxic or deleterious material from entering the water. Silt fences shall be placed during construction to prevent sediments from entering the water or migrating away from the work site. During construction, booms will be placed around the construction site to contain oil or other floating material that may be released from sediments or construction equipment.
- All construction debris and excavated material shall be properly disposed of (contained and treated as required) on land so that it cannot enter the waterway or cause water quality degradation.
- All construction and disposal activities will be conducted in accordance with the BNC hazardous substance spill prevention, control and countermeasure plan.
- If the parking lot is disturbed, restore the parking lot curb and pavement to line up with and match the existing parking lot and curb. Replace top soil and vegetation to match existing as required between the parking lot and armor rock.
- Contractor shall conduct a pre and post construction survey.
- Remove and dispose of the landfill debris that has fallen on to the beach.
- Although some work may be done at or below the EHWL (+14.67 feet), no in water work will be done. Work must be scheduled during low tide events.
- Build a sloped armor rock wall along the Charleston Beach Shoreline in the area between to armor rock wing wall and the sheet pile retaining wall. This distance is approximately 120 feet between STA 3+00 and 4+20
- Match the slope/shape, strength, and material of the existing armor rock wall that continues to the South west along the shore of OU A. This armor rock is approximately 4 feet deep at the top and 4 feet deep at the base and built at a 1 to 1 slope.
- Place the leading edge of the toe of the armor rock wall at or above EHWL where ever possible. If this is not possible in every location, account for the lost habitat at another location along the armor rock wall by placing the rock farther up the beach. Design the toe in such a manner to prevent undermining and erosion of the armor rock wall. Restore the beach at the toe of the armor rock.
- Cut back the existing escarpment as needed to allow for placement of the armor rock. Sample the removed material for waste characterization and dispose of appropriately.
- Provide an appropriate transition at both ends of the new armor rock retaining wall i.e. at the end with the armor rock wing wall and at the end with the sheet piling to prevent further erosion that might undermine the armor rock.
- Restore the parking lot and curb to match existing and to transition smoothly with the existing structures i.e. curb, pavement structure and type, and the sheet pile wall. Fill in disturbed areas with matching vegetation or soil to provide smooth transitions.
- Mobilization is included in this task. If Option 1 from Task 5.7 is chosen, the mobilization effort will share the mobilization of Task 5.4.

Task 5.5 Sampling and Analysis and Waste Disposal

Sub Task 5.5.1 Field Sampling and Analysis:
Provide soil sampling and analysis to support Site Health and Safety plans for providing guidance to workers concerning possible contaminants present at the site. This task does not include sampling and analysis or waste disposal effort for the pre priced options in Task 5.7.

Sub Task 5.5.2 Sampling and Analysis for Waste Disposal:
Provide soil sampling and analysis to support waste disposal for the excavation and disposal of the fill at OU A. Assume non-hazardous wastes.

Task 5.6 Closure Report

Provide a Closure Report to include a description of all the work accomplished on this TO including background, design drawings, a description of materials used, pre and post survey photographs and drawings, and as-built drawings. Provide all sampling and analysis data. Include the BA as an appendix.

The contractor shall submit an internal draft 30 calendar days after the completion of the construction work.

The contractor shall submit a draft report incorporating all resolutions to Navy comments on the internal draft. The draft report shall be submitted 21 days from receipt of the internal draft comments.

The contractor shall submit a final report incorporating all resolutions to Navy and regulator comments on the draft. The final report shall be submitted no later than 21 days after receipt of the draft comments.

This task does not include Closure Report effort for the pre priced options in Task 5.7. Include the closure report for Task 5.7 in an appendix of the Task. 5.6 closure report.

Task 5.7 Fish Mix Replenishment Pre Negotiated Options

Install fish mix in the area below the newly installed armor rock. The fish mix shall be per the specifications in Ref. 5 and shall be placed over the armor rock up to the elevation of +15 feet NGVD29. The fish mix will extend from the rock rip rap wing wall on the west end of the beach, extend east to STA 4+20 (the beginning of the sheet pile retaining wall) and taper smoothly on the east end of the new armor rock in order to blend in with the beach below the sheet piling. Design improvements beyond the specifications in Ref. 5 may be incorporated.

Options 1 and 2 will provide effort for Project Management, Project Plan (Work Plan, Health and Safety Plan, QC Plan), Biological Assessment, and Closure Report separately from the OU A Remedy armor rock placement.

The term for exercising these options is 180 days after the award of this TO.

The duration of each of these options is 4 months.

Task 5.7.1 Option 1 Install Fish mix using the same mobilization as the armor rock installation.

Task 5.7.2 Option 2 Install Fish mix using a stand alone mobilization.

6.0 DELIVERABLES

TASK REF.	DELIVERABLE ITEM / EVENT	DURATION (days from award or prior task*)	No. Hard / Electronic Copies
	TO Award	Approximate date: 30 August 2007	
5.2	**Work Plan, Health and Safety Plan, and QA Plan**		
	Internal Draft	5 October 2007	2H, 2E
	Government Comments	12 October 2007	
	Draft	26 October 2007	2H, 4E
	Review Conference Call	Week of November 5th	
	Final	19 November 2007	4H,4E
5.6	**Closure Report**		
	Internal Draft	31 January 2008	2H, 2E
	Government Comments	15 February 2008	
	Draft	07 March 2008	2H, 4E
	Final	30 April 2008	4H,4E

*Days are calendar days

The submittal of all deliverables, sampling data and laboratory data packages, required under this Delivery Order shall be in accordance with the Navy's most recent Standard Operating Procedure (SOP). An updated copy of the Gantt chart will be provided to the RPM and COR via email on a monthly basis.

The Period of performance for this task order is from award until 30 April 2008.

7.0 POINTS OF CONTACT:

Naval Facilities Engineering Command Northwest
1101 Tautog Circle
Silverdale, Wa. 98315
Fax: (360) 396-0857

Environmental Project Manager
Suzanna Jefferis (360)396-0053
Suzanna.jefferis@navy.mil

Field Support Manager/COTR
Michael Carsley (360) 396-0143
Michale.carsley@navy.mil

Contracting Officer
Navy Technical Representative
John Pittz (360)396-0005
John.pittz@navy.mil

Table 5.1: Performance Requirements Summary

Project Name:	Contract & Task Order No: / CTO-	Remedial Project Manager:	RPM Phone: (360)
Contractor:	Date Prepared:	Navy Technical Rep:	NTR Phone: Office Cell

CPAR Area of Evaluation	Performance Requirement	Task Reference	Acceptable Quality Level AQL	Performance Assessment Method	Rating Incentive Detail
Quality of Product or Service	Receive reports free from defects or errors (ensure the contractor has an acceptable quality control system.)	5.2 5.5 5.7	Majority of comments due to technical issues. No more than 5 technical editing type comments.	RPM	
Schedule	Receive reports within the specified time.	5.2 5.5 5.6 5.7	Received + or – 2 days from the scheduled due date	RPM	
Business Relations	Construction Requirements (Schedule)	5.4 5.7	Work done within 5 working day of planned schedule	RPM/NTR	
	Construction Requirements (Built to Specification)	5.4 5.7	Built to specification with no change orders.	RPM/NTR	
	Meet current safety requirements of federal law.	5.4 5.7	No injury or lost time accidents.	NTR	

MEMORANDUM TO FILE

TO: FILE

FROM: SUZANNA JEFFERIS

SUBJECT: HISTORY AND COURSE OF ACTION CHARLESTON BEACH

DATE: 12/11/2007

Background

1) **Attachment 1** (Figure 6-5 from the OU A ROD) shows a plan view of the OU A at the time of the RI/FS and the ROD. Note the boundaries of OU A. OU A is made up of fill material containing various contaminants laid directly over native marine soils. The fill is contained by the rock armor seawall.

2) OU A ROD 11/22/96: Section 11.0 The Selected Remedy lists the major components of the selected remedy for OU A. Two of these components are repeated as follows: 1) Upgrading the pavement cap over approximately 3.7 acres. 2) Placing erosion protection (additional riprap or stabilized cobble/gravel layer) along approximately 1,400 linear feet of the existing shoreline. If Placement of the riprap causes there to be a net loss of productive capacity of fish and shellfish habitat, mitigation measures will be incorporated into the project. The Navy will consult with the stakeholders, including the Suquamish Tribe and the Washington State Department of Fish and Wildlife about appropriated mitigation measures.

3) Pier D Mitigation Project established habitat in Zone 1 of OU A (i.e., Charleston Beach parking lot). See **Attachment 2** for conditions prior to the mitigation and **Attachment 3** for conditions after the mitigation. (Drawings are from the Final Closure Report Charleston Beach Habitat Restoration Project BNC.) The habitat restoration includes all the area between the curb at the edge of the parking lot out to the outer edge of OU A which is marked by the farthest point seaward of

the old riprap seawall. Part of this restoration area is a vegetated cap and part is the area covered by beach mix, i.e. the new beach area.

4) The Pier D Mitigation project removed landfill material from the curb seaward down to a grade that makes up the base over which the top soil and beach material was placed. See **Attachment 4** for a cross section showing the Pier D Mitigation as builts. (This drawing comes from the Final Closure Report Charleston Beach Habitat Restoration Project BNC). The landfill materials that are still in place under the top soil and beach mix are part of OU A and contain contaminated fill.

5) Although the Pier D Mitigation project altered the configuration of the OU A Remedy, the following statement from the Final Closure Report Charleston Beach Habitat Restoration Project, BNC (1.2 Regulatory Framework) states the following: "The Shipyard is listed on the NPL as a CERCLA site, and is divided into four OUs (OU A, OU B, OU C, and OU NSC). The Charleston Brach mitigation project is located in Zone 1 of OU A. The ROD for OU A identified containment of fill as the primary remedy. To ensure that the OU A remedy remained effective, the mitigation action removed fill and riprap from the marine environment, and a new-3-foot layer of beach mix replicating the existing beach material was placed where the fill and riprap were removed. The new beach was deemed by Ecology to be as protective of human health and the environment as the existing remedy, as long as scouring is not excessive."

6) As indicated by observing the beach mix erosion gages, the beach mix has been eroding from the south west side of the beach. It appears that much of the beach material has moved to the north east side of the beach thus enhancing that area of the beach. This is evidenced by the fact that we can no longer see the top of the erosion gage that was placed on this part of the beach. Another indication that the beach mix has been moving in this direction is that the storm sewer outfall to the north west of the beach has become clogged with beach sediment. Attachments 2 and 3 show the outfall as a dotted line located at about

C12. Although the beach has been eroding from the south west side over the past 5 years, during the 2005/2006 storm season, the beach mix had eroded to the point that contaminated landfill debris began appearing on the beach near the bluff.

7) The Navy initiated a TCRA (September 2007). This was done to address the erosion along 120 lineal feet of shoreline at OU A before another storm season erodes more of the beach which could cause even more materials to be released into Sinclair Inlet. See **Attachment 5.** The Navy worked with the Suquamish Tribe, EPA, and Ecology to develop a design to contain the landfill behind the scoured bluff. The plan was to repair the OU A remedy prior to the winter 07 storm season. Re-placement of the fish mix was part of this project. A Biological Assessment was done and approved by National Marine Fisheries. The contractor mobilized and began preparing to build the wall. The Navy asked USFW to come look on the beach for surf smelt eggs. Eggs were found and the Navy told the contractor to stop work. Currently, USFW and the Suquamish Tribe are interested in taking more time to study the remedy repair and habitat restoration.

8) As part of the design process for executing this TCRA, a site survey along the 120 lineal feet of affected shoreline was performed. **Attachment 6** shows an overlay of elevations of the current conditions vs. the post Pier D Mitigation conditions. What becomes clear by observing these two drawings, is that sufficient beach mix and top soil have eroded, both horizontally and vertically, resulting in a breach of the erosion protection both in the base of the bluff back of the beach and in the surface of the beach. Of particular interest, are the locations where soil boring samples B9 and B12 were taken and analyzed during the preliminary design phase for the 2001/2002 Pier D Mitigation action. The soil samples that were taken approximately 1.5 feet below the planned depth of excavation for constructing the new beach show that the SQS for mercury was exceeded at both of these locations. The current site survey of the beach indicates that there has been a breach in the erosion protection at these locations. **Attachment 7** summarizes the soil sampling results from the Pier D

Mitigation. The SQS for mercury, copper, lead, and zinc were also exceeded at boring B15. There is still approximately one foot of beach mix cover at B15.

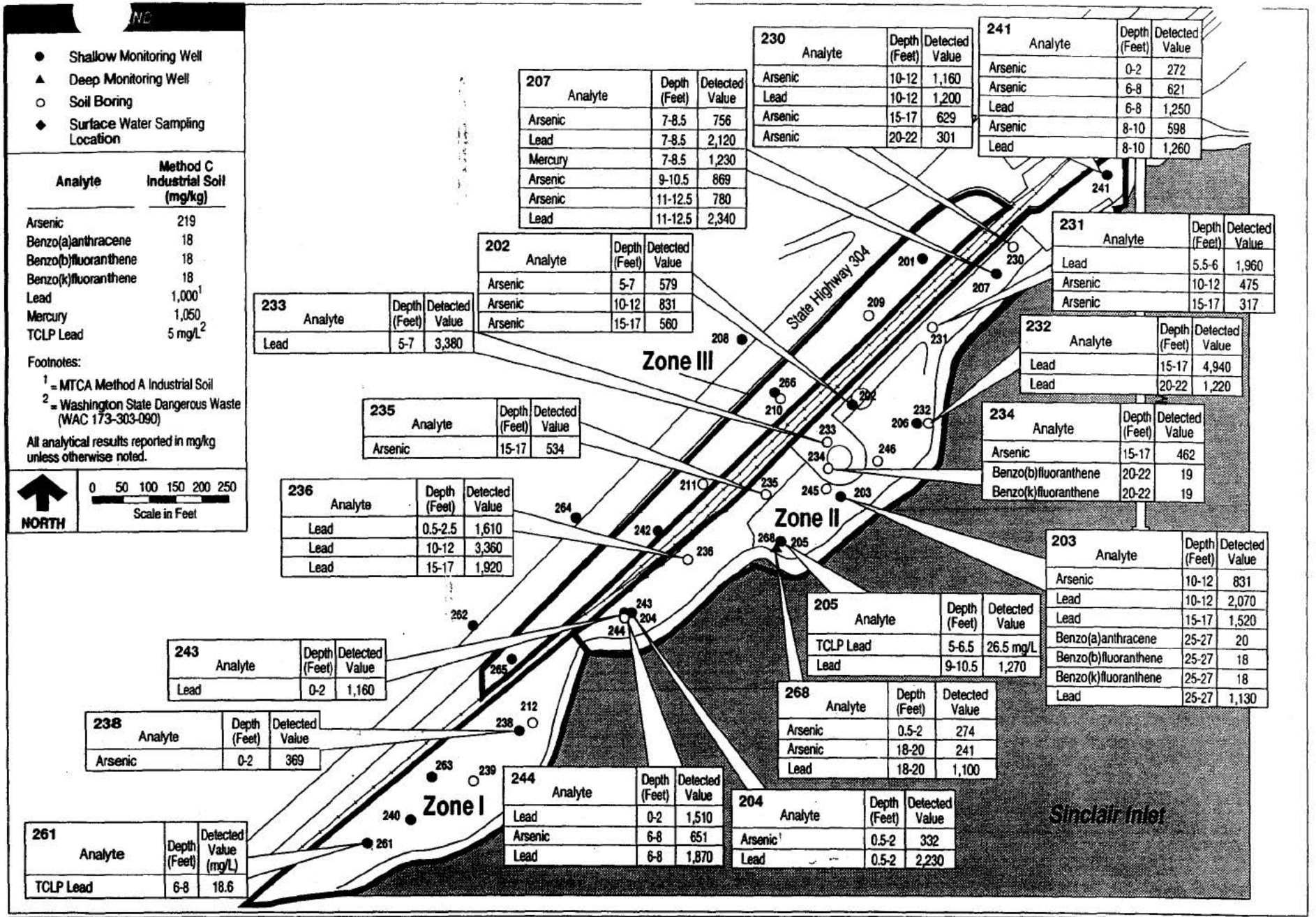
9) **Attachment 8** shows the location of the OU B Marine caps that are located directly off shore from OU A. These caps need to be protected from erosion materials coming from OU A.

Discussion

1) The beach mix that was installed during the Pier D Mitigation has been shown to be unstable because it has exhibited excessive scouring. This means that this type of beach mix has been shown not to be protective per the OU A ROD, as was hoped at the time of the Pier D Mitigation project.

2) Since OU A still extends out to the edge of the old rip-rap seawall, the Navy must take action to restore erosion protection for the effected area of OU A and it must be done in a manner consistent with the OU A ROD. The effected area includes the beach area that was created during the Pier D Mitigation as well as the soft bank bluff.

3) Although the Navy initiated a TCRA to address the erosion at Charleston Beach, EPA, Ecology, and USFW agree that the action does not have to be time critical. They agree that the solution to the remedy repair can wait until August 2008 to allow for more time to study the possible remedy solutions and to plan for construction during a time when surf smelt spawning is less active. They agree that, although the Second Five Year Review sets April 2008 as a milestone to accomplish the repair, that the benefits from taking more time to study the situation outweigh the risks of waiting through one more storm season.



CLEAN
COMPREHENSIVE LONG TERM ENVIRONMENTAL ACTION NAVY

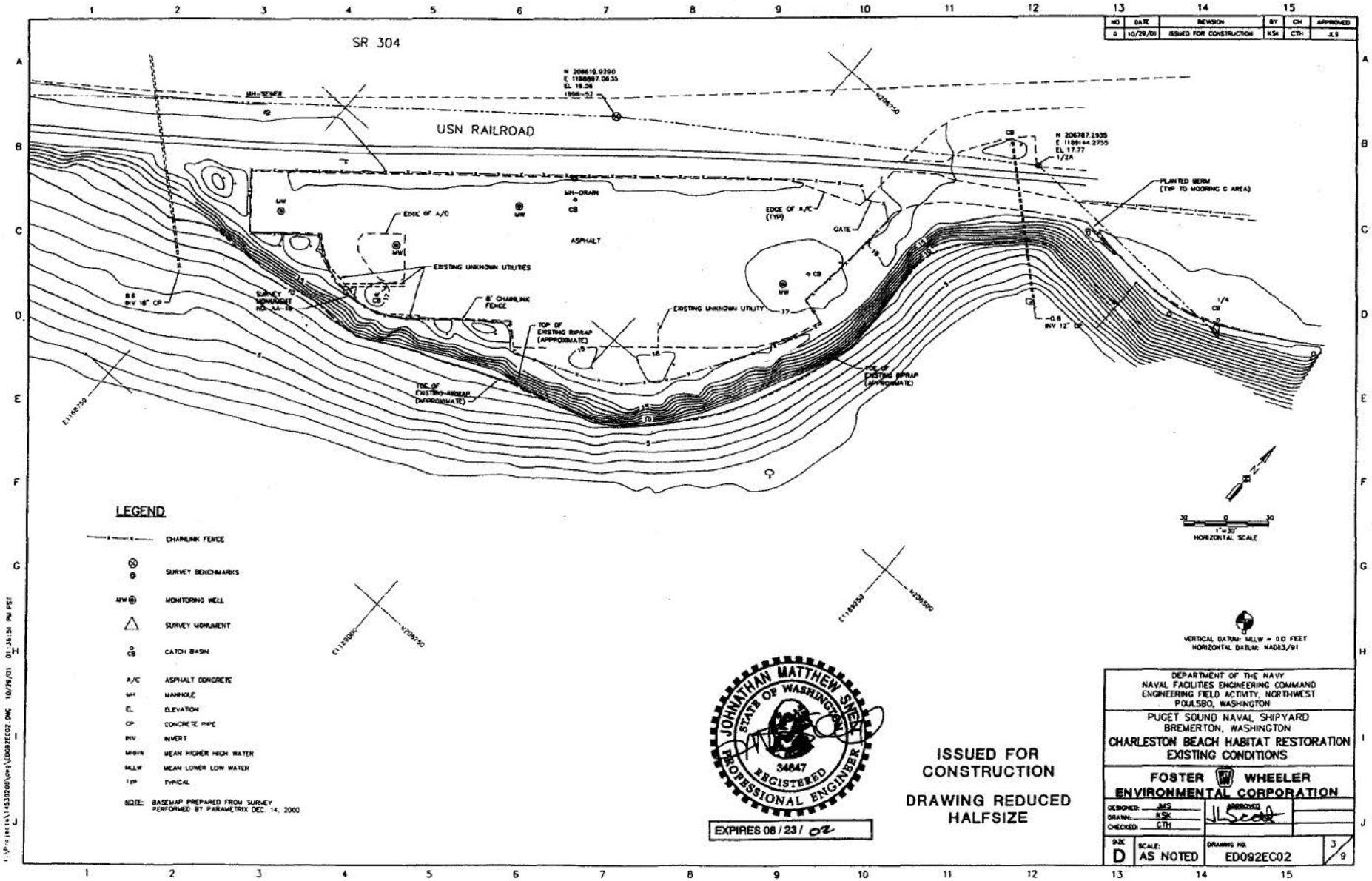
Figure 6-5
Exceedances of MTCA Method C Industrial Screening Levels for Soil (Excludes TPH)

CTO 0160
PSNS OU A
Bremerton, Washington
FINAL ROD

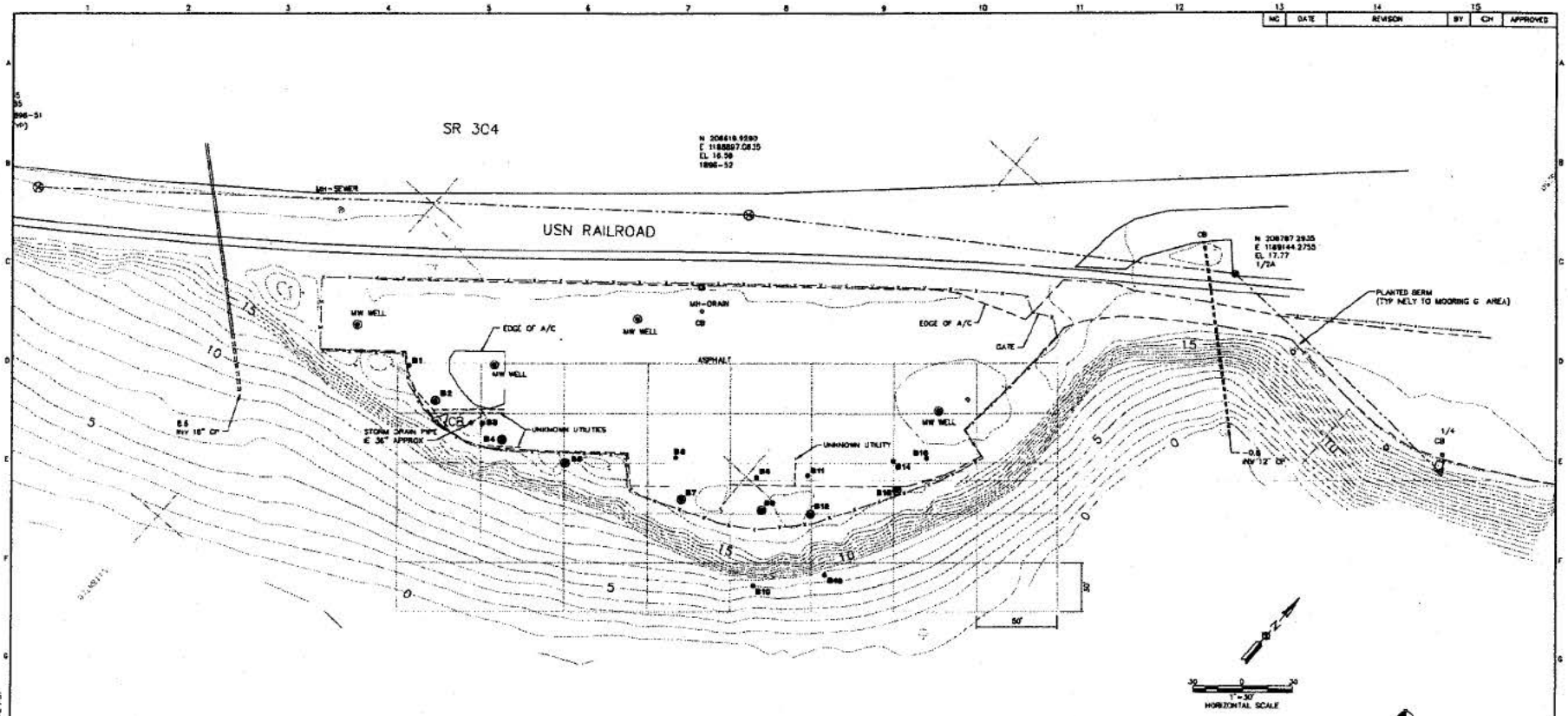
533160006-101-112096

Attachment 1

Attachment 2



Attachment 2



EG Sample Location	Northing	Easting	Elevation
B1	208417.25	1188803.32	17.53
B2	208411.65	1188828.61	17.39
B3	208419.81	1188859.32	17.02
B4	208420.12	1188874.58	17.21
B5	208434.84	1188912.34	16.72
B6	208480.57	1188960.33	17.5
B7	208484.09	1188979.27	17.77
B8	208503.86	1189005.17	17.87
B9	208491.21	1189020.30	17.77
B10	208453.22	1189046.76	6.25
B11	208525.52	1189028.21	17.56
B12	208509.34	1189044.67	17.61
B13	208467.02	1189075.83	7.14
B14	208498.22	1189061.53	17.43
B15	208554.44	1189074.06	17.09
B16	208580.59	1189084.41	17.32

FG Sample Locations	Northing	Easting	Elevation
B1	208417.25	1188803.32	16.83
B2	208411.65	1188828.61	14.36
B3	208419.81	1188859.32	14.25
B4	208420.12	1188874.58	13.58
B5	208434.84	1188912.34	14.12
B6	208480.57	1188960.33	17.58
B7	208484.09	1188979.27	14.39
B8	208503.86	1189005.17	16.26
B9	208491.21	1189020.3	13.9
B10	208453.224	1189046.776	6.25
B11	208525.52	1189028.21	16.45
B12	208509.34	1189044.67	13.56
B13	208467.017	1189075.828	6.86
B14	208498.22	1189061.53	17.56
B15	208554.44	1189074.06	14.96
B16	208580.59	1189084.41	17.1

LEGEND:

B1 EXCAVATED SOIL STATION LOCATIONS

B2 EXCAVATED SOIL AND EXPOSED FILL STATION LOCATIONS

NOTES:

1. EXCAVATED SOIL STATION LOCATIONS BASED ON KITSAP COUNTY HEALTH DEPARTMENT RECOMMENDATIONS. ACTUAL LOCATIONS MAY VARY BASED ON FIELD CONDITIONS.
2. SURVEY PERFORMED BY PARAMETRIX DEC. 14, 2000

PRELIMINARY DRAFT

NOT FOR CONSTRUCTION

DRAWING REDUCED HALFSIZE

VERTICAL DATUM: MLLW = 0.0 FEET
HORIZONTAL DATUM: NAD83/91

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY, NORTHWEST
POULSBO, WASHINGTON

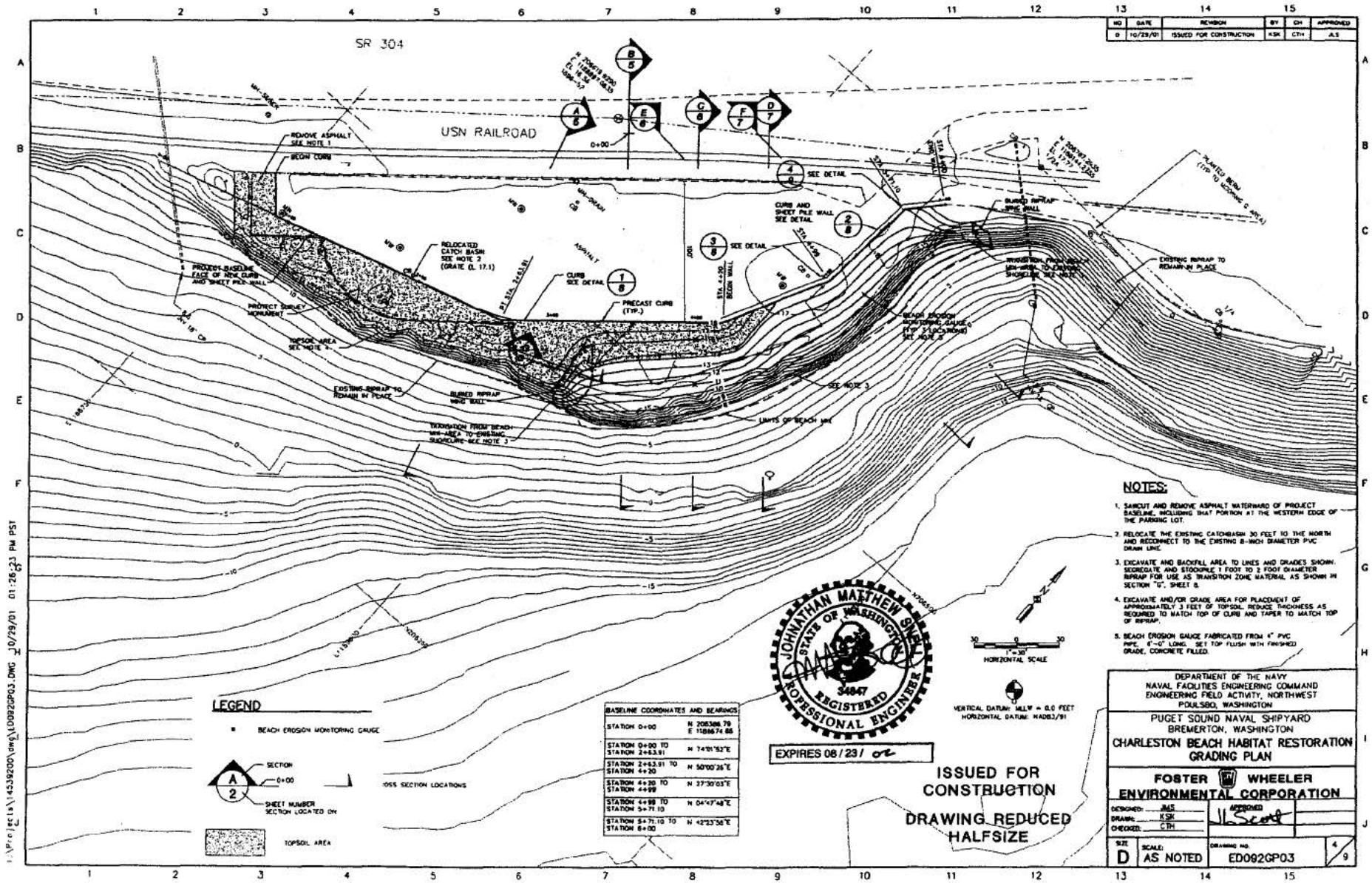
PUGET SOUND NAVAL SHIPYARD
BREMERTON, WASHINGTON

CHARLESTON BEACH MITIGATION
SAMPLE STATION LOCATIONS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

DESIGNED: DJD
DRAWN: DJD
CHECKED: RE
APPROVED

SIZE D | SCALE: AS NOTED | DRAWING NO. EDQ92SL01 | 3 / 13



Attachment 3

Attachment 4

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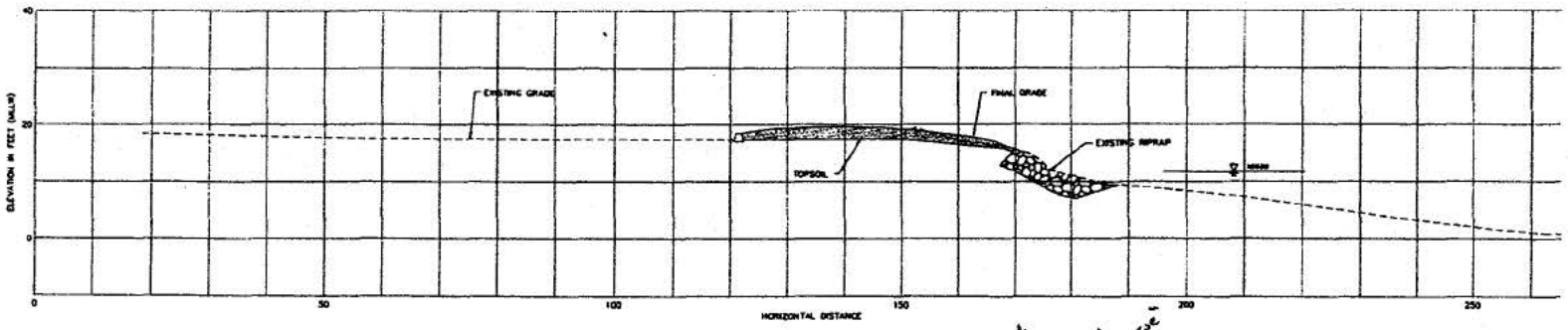
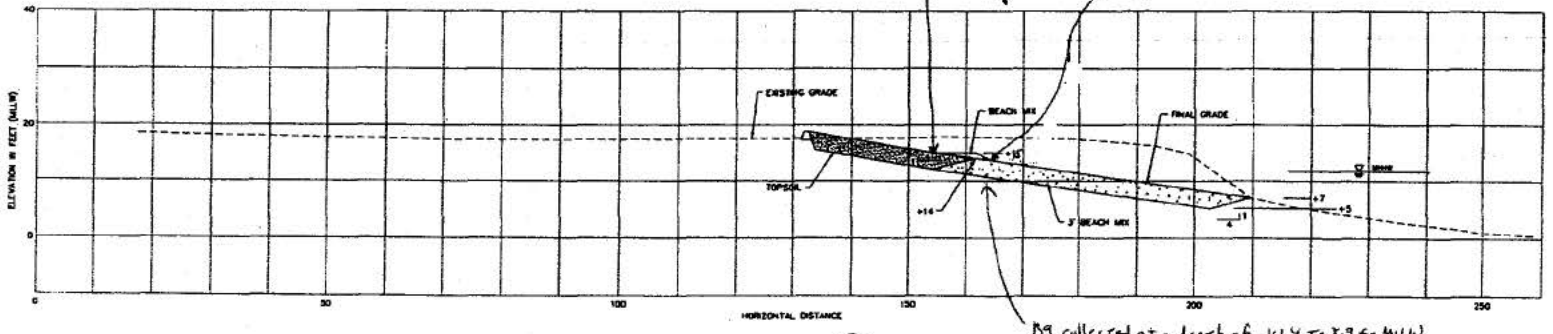


SECTION A/4



SECTION B/4

HORIZONTAL SCALE 1"=10'

VERTICAL SCALE 1"=10'

JONATHAN MATTHEW SMITH
STATE OF WASHINGTON
34847
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 08/23/02

ISSUED FOR CONSTRUCTION

DRAWING REDUCED HALFSIZE

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY, NORTHWEST
POULSBO, WASHINGTON

PUGET SOUND NAVAL SHIPYARD
BREMERTON, WASHINGTON

CHARLESTON BEACH HABITAT RESTORATION
CROSS SECTIONS A & B

FOSTER WHEELER ENVIRONMENTAL CORPORATION

DESIGNED: JMS
DRAWN: KSK
CHECKED: CTH

SIZE: D | SCALE: AS NOTED | DRAWING NO: ED092XS05 | 5/9

Attachment 4

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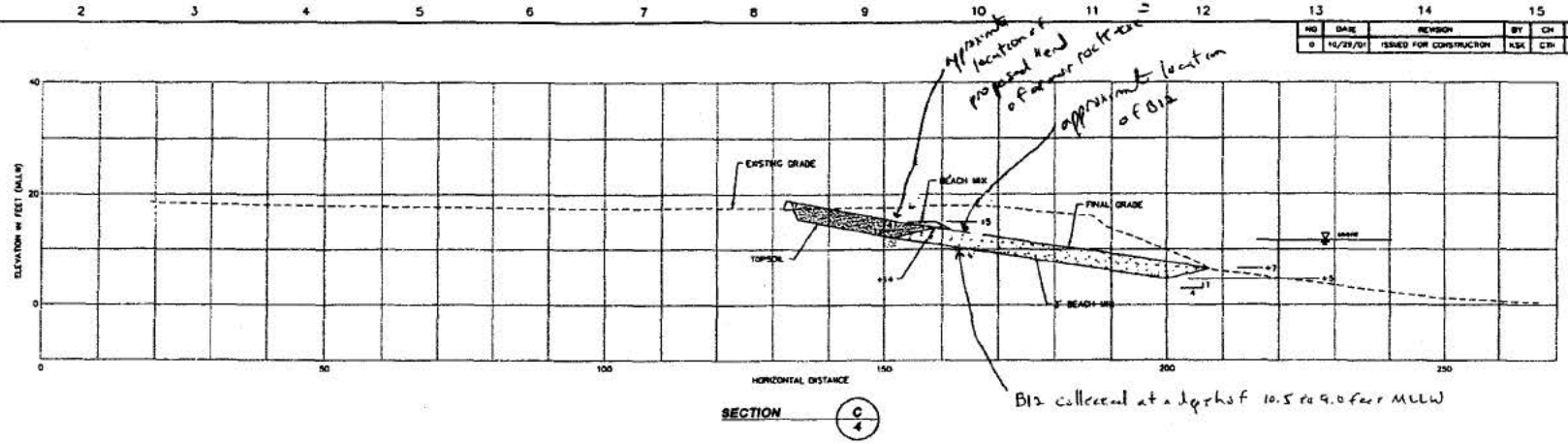
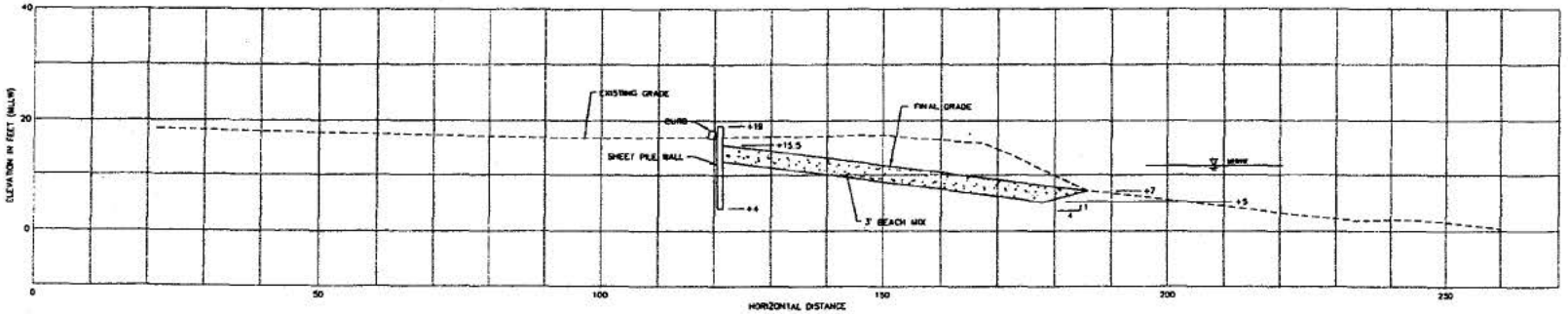


SECTION C/4



SECTION D/4

JOHNATHAN MATTHEW SNELL
STATE OF WASHINGTON
34847
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 08/23/02

ISSUED FOR CONSTRUCTION

DRAWING REDUCED HALFSIZE

1"=10' HORIZONTAL SCALE

1"=10' VERTICAL SCALE

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY, NORTHWEST
POULSBO, WASHINGTON

PUGET SOUND NAVAL SHIPYARD
BREMERTON, WASHINGTON

CHARLESTON BEACH HABITAT RESTORATION
CROSS SECTIONS C & D

FOSTER WHEELER ENVIRONMENTAL CORPORATION

DESIGNED: JMS
DRAWN: KSK
CHECKED: CTH
APPROVED:

SIZE: D
SCALE: AS NOTED
DRAWING NO.: ED092XS05
6/9

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9-6-07

ACTION MEMORANDUM

OU A CHARLESTON BEACH
BREMERTON NAVAL COMPLEX

September 2007

Attachment 5

PURPOSE

This Action Memorandum presents the U.S. Navy's decision to perform a time-critical removal action for Operable Unit (OU) A, Bremerton naval complex (BNC), Bremerton Washington, in compliance with Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act (CERCLA/SARA), the National Contingency Plan (NCP) 40 Code of Federal Regulations (CFR) 300, and under authorization of Executive Order 12580, and to the extent possible the Model Toxics Control Act, Washington Administrative Code (WAC) 173-340.

REMOVAL ACTION OBJECTIVES

This time critical removal action (TCRA) is intended to reduce the likelihood of contact with the land fill debris and contaminated soils at OU A, by restoring the OU A armor rock remedy. The removal action will thereby reduce the potential risk to human health and the environment. Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the removal action, may present an imminent endangerment to public health, welfare, and or the environment. This removal action strategy is expected to minimize additional remediation costs, at a reasonable cost, that may otherwise occur if no removal action were taken. This removal action is required to meet the requirements of the Record of Decision (ROD) for OU A.

This TCRA will also include a one time restoration of fish mix on the beach below the armor rock remedy.

The primary goals of the remedial actions are to:

- Minimize any existing risk to occasional site users/workmen from buried landfill debris.
- Restore the remedy at OU A as required by the ROD without causing a net loss of productive capacity of fish and shellfish habitat.

DESCRIPTION OF REMOVAL ACTION

The objective is to repair, cap, and stabilize the OU A remedy per the Record of Decision (ROD) of 16 December 1996 without causing a net loss of productive capacity of fish habitat or infringing on the additional beach habitat that was created as part of the Pier D Mitigation project. This will be accomplished by the following actions:

- Build a sloped armor rock wall along the Charleston Beach Shoreline in the area between to armor rock wing wall and the sheet pile retaining wall. This distance is approximately 120 feet between STA 3+00 and 4+20
- Match the slope/shape, strength, and material of the existing armor rock wall that continues to the South west along the shore of OU A. This armor rock is approximately 4 feet deep at the top and 4 feet deep at the base.

Attachment 5

- Place the leading edge of the toe of the armor rock wall at the extreme high water level (EHWL) contour. Design the toe in such a manner to prevent undermining and erosion of the armor rock wall. Restore the beach at the toe of the armor rock.
- Cut back the existing escarpment as needed to allow for placement of the armor rock. Characterize waste and dispose of appropriately.
- Provide an appropriate transition at both ends of the new armor rock retaining wall to prevent further erosion that might undermine the armor rock.
- Restore the parking lot and curb to match existing and to transition smoothly with the existing structures i.e. curb, pavement structure and type, and the sheet pile wall. Fill in disturbed areas with matching vegetation or soil to provide smooth transitions.
- Install fish mix to specifications similar to the Pier D Mitigation project. Study and provide options for fish mix stabilization.

ALTERNATE ACTIONS EVALUATED

Two alternatives were considered. The first was to restore the remedy per the Pier D Mitigation i.e. soft beach with no hard protection for the land fill. This option has failed in the past, so it was not chosen. Also, the OU A ROD requires "erosion protection (additional riprap or stabilized cobble /gravel)". The second was to continue the sheet pile wall between the existing sheet pile wall and the rock wing wall. This option was not chosen because of the high cost and the risk for increased cost involved with placing sheet pile.

REMOVAL ACTION COST AND SCHEDULE

The estimated capital cost for placement of the armor rock is [redacted] The estimated capital cost for the one time placement of fish mix is [redacted] Work is scheduled to be completed approximately 9 months after commencement of this removal action.

Attachment 5

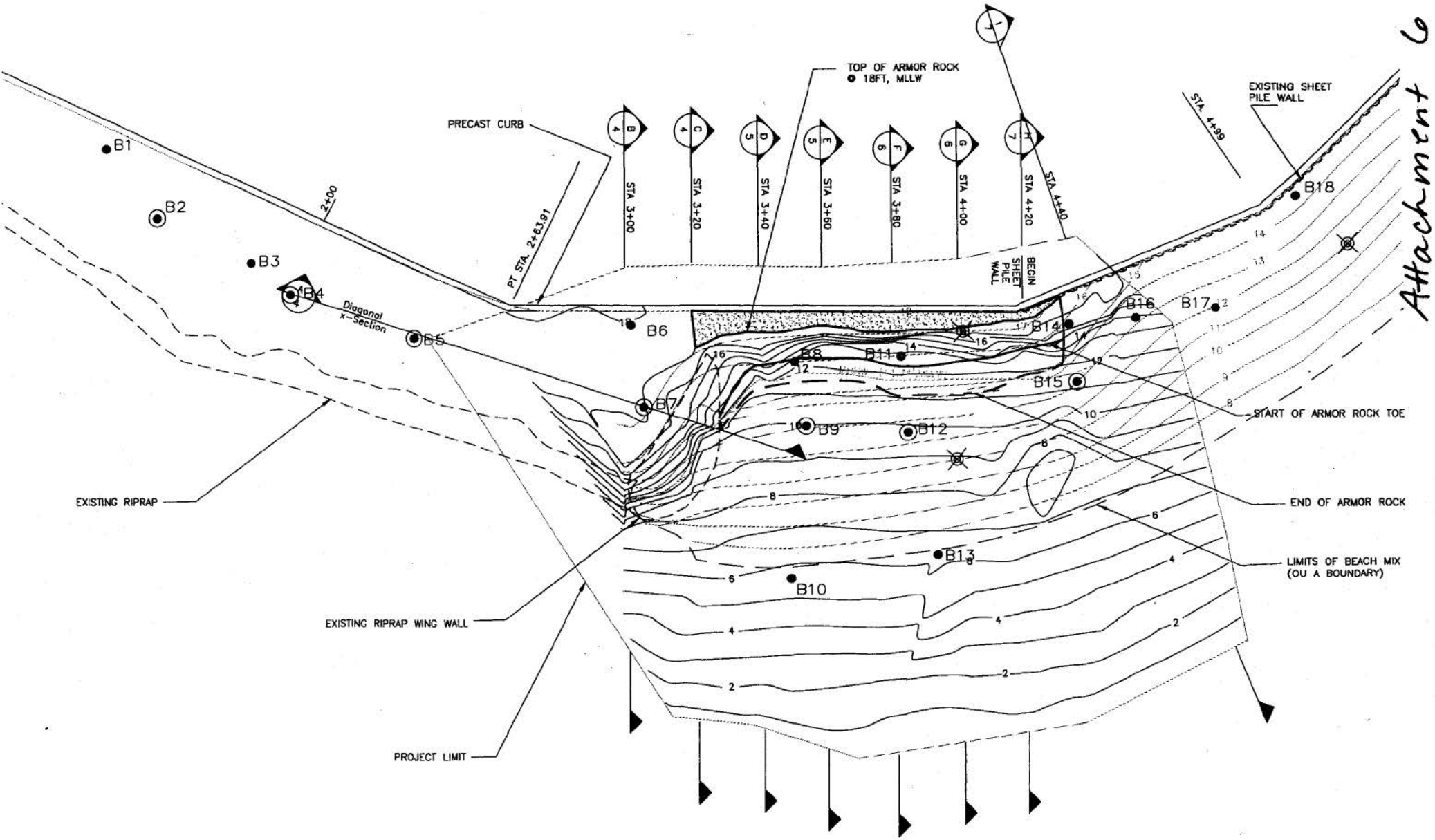
APPROVAL

The selected removal action is protective of human health and the environment, complies with federal and state requirements, is cost effective, and is consistent with all reasonable final remedies.

9/5/07

R. S. Tanaka Date
Captain, U.S. Navy
Commanding Officer, Naval Base Kitsap

Attachment 5



Attachment 6

5+

RING GAUGE

NES AS OF OCTOBER 2001

NOTES:

1. TOPOGRAPHIC SURVEY CONDUCTED BY SES-TECH ON SEPTEMBER 10, 2007.

BREMERTON TIDE DATA	
TIDE DATUM	ELEVATION (FT)
EXTREME HIGH WATER (EHW)	14.67*

BASELINE COORDINATES AND BEARINGS	
STATION 0+00	N 206386.79 E 1188674.86
STATION 0+00 TO STATION 2+63.91	N 74°01'52"E
STATION 2+63.91 TO STATION 4+20	N 50°00'26"E

AH. 7.

SUMMARY OF DATA AS C

	Boring Number	B2						**SMS[3/] SQS**
	Sample Depth (BGS)	7.0 - 8.5						
	Chemical Parameter	SS-001						
	TOC (%)	0.30						
	Fines (%)	20.5						
	Sand (%)	71.4						
	Gravel (%)	8.1						
Metals (mg/kg dw)								ng/kg dry weight
	Arsenic	**118**						57
	Cadmium	1.3		---		0.5	5.1	5.1
	Chromium	86.3		112		22.7	260	260
	Copper	**1830**		**1290**		87.4	390	390
	Lead	421		285		47	450	450
	Mercury	**1.70**		**16.0**		**2.27**	0.41	0.41
	Silver	0.7		0.4		0.3 U	6.1	6.1
	Zinc	**2180**		**1130**		136	410	410
Nonionizable Organic Compounds								
	Aromatic Hydrocarbons	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg organic carbon
	Total LPAH	1161	**387**	284	26	39	39	5200	370
	Naphthalene	17 U	5.7 U	16 U	1.5 U	37 U	37 U	2100	99
	Acenaphthylene	17 U	5.7 U	21	2	37 U	37 U	1300	66
	Acenaphthene	50	**16.7**	16 U	1.5 U	37 U	**37 U**	500	16
	Fluorene	51	17	16 U	1.5 U	37 U	**37 U**	540	23
	Phenanthrene	850	**283**	200	18	39	39	1500	100
	Anthracene	210	70	63	5.7	37 U	37 U	960	220
	2-Methylnaphthalene	17 U	5.7 U	16 U	1.5 U	37 U	37 U	670	38
	Total HPAH	11010	**3670**	3183	289	425	425	12000	960
	Fluoranthene	**1800**	**600**	560	51	52	52	1700	160
	Pyrene	2200	733	440	40	44	44	2600	1,000
	Benzo[a]anthracene	1200	**400**	300	27	37 U	37 U	1300	110
	Chrysene	1300	**433**	310	28	56	56	1400	110
	Total benzofluoranthenes	1760	**587**	690	63	142	142	3200	230
	Benzo[a]pyrene	1100	**367**	310	28	44	44	1600	99
	Indeno[1,2,3-cd]pyrene	**800**	**267**	290	26	49	**49**	600	34
	Dibenz[a,h]anthracene	220	**73**	63	5.7	37 U	**37 U**	230	12
	Benzo[g,h,i]perylene	630	**210**	220	20	38	**38**	670	31
	Chlorinated Hydrocarbons								
	1,2-Dichlorobenzene[3/]	1.0 U	0.3 U	1.0 U	0.1 U	1.0 U	1.0 U	35	2.3
	1,4-Dichlorobenzene[3/]	1.0 U	0.3 U	1.0 U	0.1 U	1.0 U	1.0 U	110	3.1
	1,2,4-Trichlorobenzene[3/]	4.9 U	**1.6 U**	5.0 U	0.5 U	5.2 U	**5.2 U**	31	0.81
	Hexachlorobenzene	17 U	**5.7 U**	16 U	**1.5 U**	**37 U**	**37 U**	22	0.38
	Hexachlorobutadiene	**17 U**	**5.7 U**	**16 U**	1.5 U	**37 U**	**37 U**	11	3.9
	Phthalate Esters								
	Dimethyl phthalate	17 U	5.7 U	16 U	1.5 U	37 U	37 U	71	53
	Diethyl phthalate	17 U	5.7 U	16 U	1.5 U	37 U	37 U	200	61
	Di-n-butyl phthalate	17 U	5.7 U	16 U	1.5 U	37 U	37 U	1400	220
	Butyl benzyl phthalate	17 U	**5.7 U**	50	4.5	37 U	**37 U**	63	4.9
	Bis[2-ethylhexyl]phthalate	220	**73**	310	28	180	**180**	1300	47
	Di-n-octyl phthalate	17 U	5.7 U	16 U	1.5 U	37 U	37 U	6200	58
	Miscellaneous								
	Dibenzofuran	20	6.7	16 U	1.5 U	37 U	**37 U**	540	15
	N-nitrosodiphenylamine	17 U	5.7 U	16 U	1.5 U	**37 U**	**37 U**	28	11
	Total PCBs	34 U	11 U	**280**	**25**	37 U	**37 U**	130	12
Ionizable Organic Compounds								ug/kg dry weight	
	Phenol	17 U	--	**680**	--	320	--	420	420
	2-Methylphenol	17 U	--	16 U	--	37 U	--	63	63
	4-Methylphenol	17 U	--	82	--	37 U	--	670	670
	2,4-Dimethylphenol	17 U	--	16 U	--	**37 U**	--	29	29
	Pentachlorophenol	86 U	--	80 U	--	180 U	--	360	360
	Benzyl alcohol	17 U	--	16 U	--	37 U	--	57	57
	Benzoic acid	170 U	--	160 U	--	370 U	--	650	650

Notes:

1/ The source of the sediment quality criterion or value, from 1988 Update and Evaluation of Puget Sound AET, prepared for EPA by R. Barrick, S. Becker, L. Brown, H. Beller, and R. Pastorak. The dry weight based values for nonionizable organic compounds are not adopted standards by SMS, and should be used with discretion using BPJ when TOC levels do not allow the use of the TOC-normalized standards in the SMS. LAET is the Lowest Apparent Effects Threshold.

2/ Sediment Management Standards (Ecology, 1995).
a Where chemical criteria in this table represent the sum of individual compounds or isomers, the following methods shall be applied: (i) Where chemical analyses identify an undetected value for every individual compound/isomer then the single highest detection limit shall represent the sum of the respective compounds/isomers; and (ii) Where chemical analyses detect one or more individual compound/isomers, only the detected concentrations will be added to represent the group sum.
b The total LPAH criterion represents the sum of the following low molecular weight polynuclear aromatic compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. 2 Methylnaphthalene is not included in the LPAH definition The LPAH criterion is not the sum of criteria values for the individual LPAH compounds listed
c The total HPAH criterion represents the sum of the following high molecular weight polynuclear aromatic compounds: fluoranthene, pyrene, benzo[a]anthracene, chrysene, total benzofluoranthenes, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[g,h,i]perylene. The HPAH criterion is not the sum of criteria values for the individual HPAH compounds listed.
d The total benzofluoranthenes criteria are to be compared to the sums of the concentrations of the b, j, and k isomers of benzofluoranthene.
e The listed values represent concentrations in parts per million "normalized" on a total organic carbon basis. To normalize to total organic carbon, the dry-weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.

3/ 1,2-Dichlorobenzene; 1,4-Dichlorobenzene; and 1,2,4-Trichlorobenzene were analyzed by both EPA Methods 8260B and 8270C. Except for SS-014EX, the values reported in this table are from the 8260B analyses since these had lower detection limits.

(a) Value represents average of three values.

35 U Value exceeds either LAET and/or SQS.

Attachment 7

SUMMARY OF DATA AS COMPARED TO THE SQS AND LAET

Boring Number	B7		B9		B9			
Sample Depth (BGS)	6.0 - 7.5		8.0 - 9.5		8.0 - 9.5		LAET[1/]	SMS[2/] SQS
Chemical Parameter	SS-007		SS-009		SS-010(dup of SS-009)			
TOC (%)	0.20		0.25		0.12			
Fines (%)	4.1		3.0		3.0			
Sand (%)	67.6		59.9		60.8			
Gravel (%)	28.3		37.1		36.2			
Metals (mg/kg dw)							mg/kg dry weight	
Arsenic	5 U		5 U		5 U		57	57
Cadmium	0.2 U		0.2 U		0.2		5.1	5.1
Chromium	25.3		35.2		28.6		260	260
Copper	61.7		261		274		390	390
Lead	78		54		63		450	450
Mercury	0.29		**0.51**		**0.65**		0.41	0.41
Silver	0.3 U		0.3 U		0.3 U		6.1	6.1
Zinc	95.7		119		129		410	410
Nonionizable Organic Compounds								
Aromatic Hydrocarbons	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg organic carbon
Total LPAH	199	100	28	11	17 U	14 U	5200	370
Naphthalene	17 U	8.5 U	17 U	6.8 U	17 U	14 U	2100	99
Acenaphthylene	17 U	8.5 U	17 U	6.8 U	17 U	14 U	1300	66
Acenaphthene	17 U	8.5 U	17 U	6.8 U	17 U	14 U	500	16
Fluorene	17 U	8.5 U	17 U	6.8 U	17 U	14 U	540	23
Phenanthrene	150	75	28	11	17 U	14 U	1500	100
Anthracene	44	22	17 U	6.8 U	17 U	14 U	960	220
2-Methylnaphthalene	17 U	8.5 U	17 U	6.8 U	17 U	14 U	670	38
Total HPAH	2090	**1045**	410	164	327	273	12000	960
Fluoranthene	300	150	72	29	49	41	1700	160
Pyrene	350	175	58	23	40	33	2600	1,000
Benzo[a]anthracene	170	85	39	16	30	25	1300	110
Chrysene	210	105	41	16	34	28	1400	110
Total benzofluoranthenes	420	210	84	34	71	59	3200	230
Benzo[a]pyrene	250	**125**	42	17	35	29	1600	99
Indeno[1,2,3-cd]pyrene	190	**95**	39	16	37	31	600	34
Dibenz[a,h]anthracene	40	**20**	17 U	6.8 U	17 U	**14 U**	230	12
Benzo[g,h,i]perylene	160	**80**	35	14	31	26	670	31
Chlorinated Hydrocarbons								
1,2-Dichlorobenzene[3/]	1.1 U	0.6 U	1.0 U	0.4 U	1.0 U	0.8 U	35	2.3
1,4-Dichlorobenzene[3/]	1.1 U	0.6 U	1.0 U	0.4 U	1.0 U	0.8 U	110	3.1
1,2,4-Trichlorobenzene[3/]	5.3 U	**2.7 U**	5.2 U	**2.1 U**	5.2 U	**4.3 U**	31	0.81
Hexachlorobenzene	17 U	**8.5 U**	17 U	**6.8 U**	17 U	**14 U**	22	0.38
Hexachlorobutadiene	**17 U**	**8.5 U**	**17 U**	**14 U**	**17 U**	**14 U**	11	3.9
Phthalate Esters								
Dimethyl phthalate	17 U	8.5 U	17 U	6.8 U	17 U	14 U	71	53
Diethyl phthalate	17 U	8.5 U	17 U	6.8 U	17 U	14 U	200	61
Di-n-butyl phthalate	17 U	8.5 U	17 U	6.8 U	17 U	14 U	1400	220
Butyl benzyl phthalate	17 U	**8.5 U**	17 U	**6.8 U**	17 U	**14 U**	63	4.9
Bis[2-ethylhexyl]phthalate	180	**90**	91	36	74	**62**	1300	47
Di-n-octyl phthalate	17 U	8.5 U	17 U	6.8 U	17 U	14 U	6200	58
Miscellaneous								
Dibenzofuran	17 U	8.5 U	17 U	6.8 U	17 U	14 U	540	15
N-nitrosodiphenylamine	17 U	8.5 U	17 U	6.8 U	17 U	**14 U**	28	11
Total PCBs	35 U	**18 U**	35 U	**14 U**	35 U	**29 U**	130	12
Ionizable Organic Compounds							ug/kg dry weight	
Phenol	17 U	--	53	--	17 U	--	420	420
2-Methylphenol	17 U	--	17 U	--	17 U	--	63	63
4-Methylphenol	17 U	--	17 U	--	17 U	--	670	670
2,4-Dimethylphenol	17 U	--	17 U	--	17 U	--	29	29
Pentachlorophenol	87 U	--	86 U	--	87 U	--	360	360
Benzyl alcohol	17 U	--	17 U	--	17 U	--	57	57
Benzoic acid	170 U	--	170 U	--	170 U	--	650	650

Notes:

1 The source of the sediment quality criterion or value, from 1988 Update and Evaluation of Puget Sound AET, prepared for EPA by R. Barrick, S. Becker, L. Brown, H. Beller, and R. Pastorak. The dry weight based values for nonionizable organic compounds are not adopted standards by SMS, and should be used with discretion using BPJ when TOC levels do not allow the use of the TOC-normalized standards in the SMS. LAET is the Lowest Apparent Effects Threshold.

2 Sediment Management Standards (Ecology, 1995).

a Where chemical criteria in this table represent the sum of individual compounds or isomers, the following methods shall be applied: (i) Where chemical analyses identify an undetected value for every individual compound/isomer then the single highest detection limit shall represent the sum of the respective compounds/isomers; and (ii) Where chemical analyses detect one or more individual compound/isomers, only the detected concentrations will be added to represent the group sum.

b The total LPAH criterion represents the sum of the following low molecular weight polynuclear aromatic compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. 2 Methylnaphthalene is not included in the LPAH definition The LPAH criterion is not the sum of criteria values for the individual LPAH compounds listed

c The total HPAH criterion represents the sum of the following high molecular weight polynuclear aromatic compounds: fluoranthene, pyrene, benzo[a]anthracene, chrysene, total benzofluoranthenes, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[g,h,i]perylene. The HPAH criterion is not the sum of criteria values for the individual HPAH compounds listed.

d The total benzofluoranthenes criteria are to be compared to the sums of the concentrations of the b, j, and k isomers of benzofluoranthene.

e The listed values represent concentrations in parts per million "normalized" on a total organic carbon basis. To normalize to total organic carbon, the dry-weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.

3/ 1,2-Dichlorobenzene; 1,4-Dichlorobenzene; and 1,2,4-Trichlorobenzene were analyzed by both EPA Methods 8260B and 8270C. Except for SS-014EX, the values reported in this table are from the 8260B analyses since these had lower detection limits.

(a) Value represents average of three values.

35 U Value exceeds either LAET and/or SQS.

Attachment 7

SUMMARY OF DATA AS COMPARED TO THE SQS AND LAET

Boring Number	B12		B15			
Sample Depth (BGS)	7.5 - 9.0		4.5 - 6.0			
Chemical Parameter	SS-012		SS-014		LAET[1/]	SMS[2/] SQS
TOC (%)	0.31		3.3			
Fines (%)	5.8		7.2			
Sand (%)	65.5		41.8			
Gravel (%)	28.7		51			
Metals (mg/kg dw)					mg/kg dry weight	
Arsenic	5 U		12		57	57
Cadmium	0.2 U		1.5		5.1	5.1
Chromium	20.0		29.4		260	260
Copper	27.1		**562**		390	390
Lead	90		**1700**		450	450
Mercury	**0.69**		**2.53**		0.41	0.41
Silver	0.3 U		3.2		6.1	6.1
Zinc	76.0		**1250**		410	410
Nonionizable Organic Compounds						
Aromatic Hydrocarbons	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg OC	ug/kg dw	mg/kg organic carbon
Total LPAH	20	6.5	3748	114	5200	370
Naphthalene	18 U	5.8 U	78	2.4	2100	99
Acenaphthylene	18 U	5.8 U	36 U	1.1 U	1300	66
Acenaphthene	18 U	5.8 U	340	10	500	16
Fluorene	18 U	5.8 U	270	8.2	540	23
Phenanthrene	20	6.5	**2400**	73	1500	100
Anthracene	18 U	5.8 U	660	20	960	220
2-Methylnaphthalene	18 U	5.8 U	73	2.2	670	38
Total HPAH	227	73	10010	303	12000	960
Fluoranthene	29	9.4	**2100**	64	1700	160
Pyrene	30	10	1800	55	2600	1,000
Benzo[a]anthracene	20	6.5	1000	30	1300	110
Chrysene	25	8.1	1200	36	1400	110
Total benzofluoranthenes	53	17	1850	56	3200	230
Benzo[a]pyrene	28	9.0	1000	30	1600	99
Indeno[1,2,3-cd]pyrene	20	6.5	550	17	600	34
Dibenz[a,h]anthracene	18 U	5.8 U	130	3.9	230	12
Benzo[g,h,i]perylene	22	7.1	380	12	670	31
Chlorinated Hydrocarbons						
1,2-Dichlorobenzene[3/]	1.0 U	0.3 U	1.1 U	0.03 U	35	2.3
1,4-Dichlorobenzene[3/]	1.0 U	0.3 U	1.1 U	0.03 U	110	3.1
1,2,4-Trichlorobenzene[3/]	5.1 U	**1.6 U**	5.5 U	0.2 U	31	0.81
Hexachlorobenzene	18 U	**5.8 U**	**36 U**	**1.1 U**	22	0.38
Hexachlorobutadiene	**18 U**	**5.8 U**	**36 U**	1.1 U	11	3.9
Phthalate Esters						
Dimethyl phthalate	18 U	5.8 U	36 U	1.1 U	71	53
Diethyl phthalate	18 U	5.8 U	36 U	1.1 U	200	61
Di-n-butyl phthalate	18 U	5.8 U	36 U	1.1 U	1400	220
Butyl benzyl phthalate	18 U	**5.8 U**	36 U	1.1 U	63	4.9
Bis[2-ethylhexyl]phthalate	63	20	110	3.3	1300	47
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Miscellaneous						
Dibenzofuran	18 U	5.8 U	180	5.5	540	15
N-nitrosodiphenylamine	18 U	5.8 U	**36 U**	1.1 U	28	11
Total PCBs	36 U	11.6 U	22	0.7	130	12
Ionizable Organic Compounds					ug/kg dry weight	
Phenol	18 U	--	36 U	--	420	420
2-Methylphenol	18 U	--	36 U	--	63	63
4-Methylphenol	18 U	--	36 U	--	670	670
2,4-Dimethylphenol	18 U	--	**36 U**	--	29	29
Pentachlorophenol	90 U	--	180 U	--	360	360
Benzyl alcohol	18 U	--	36 U	--	57	57
Benzoic acid	180 U	--	360 U	--	650	650

Notes:

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e The listed values represent concentrations in parts per million "normalized" on a total organic carbon basis. To normalize to total organic carbon, the dry-weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.

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(a) Value represents average of three values.

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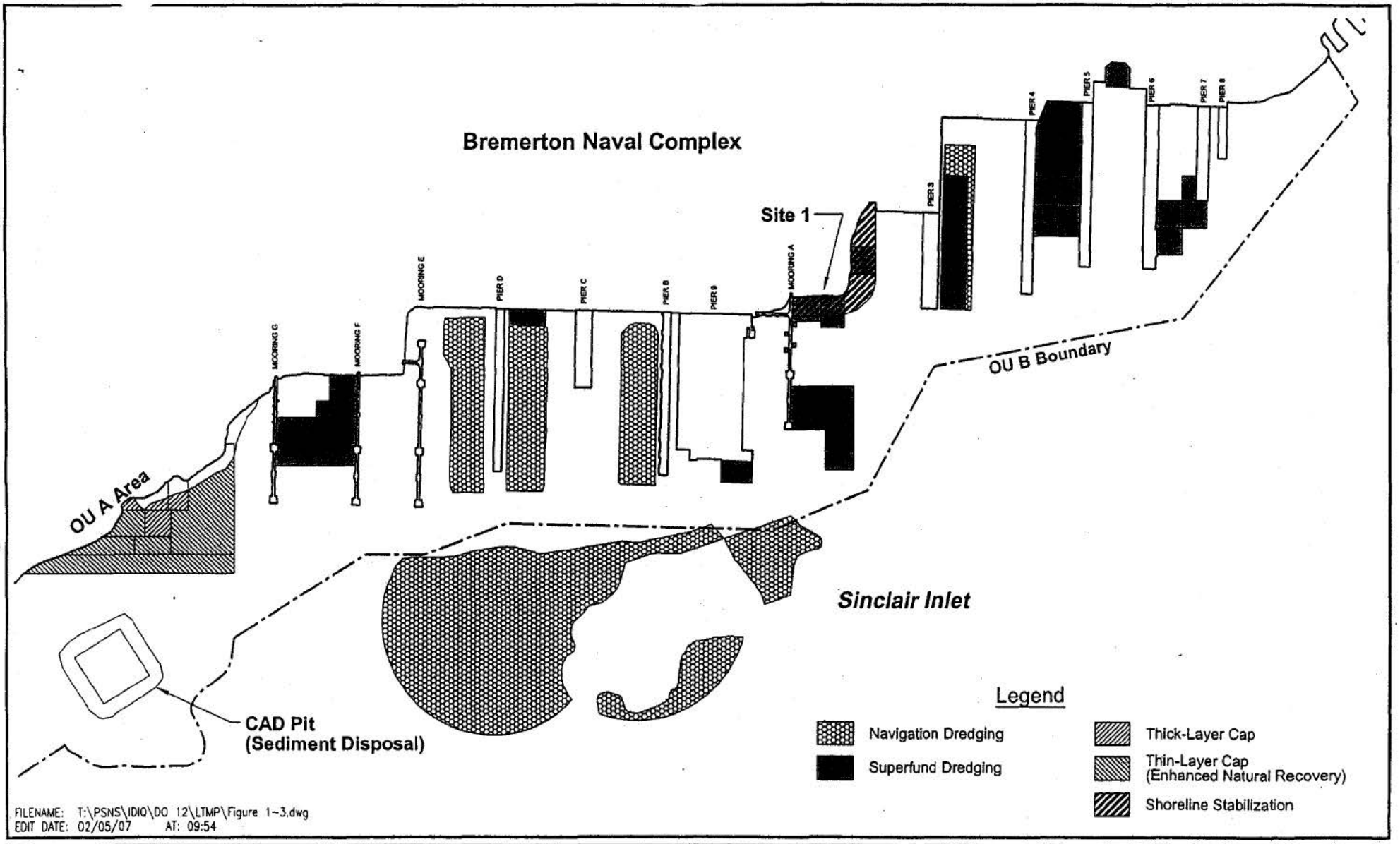
Attachment 7



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U.S. NAVY

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0 250 500 1000
SCALE IN FEET

Figure 1-3
Remedial Action at Marine OU B
(2000-2001)

Delivery Order 0012
Bremerton Naval Complex
2007 LTMP
FOR OU B MARINE

Attachment 8