**CENWS-OD-TS-DMMO**

**MEMORANDUM FOR: RECORD** **March 31, 2010**

**SUBJECT**: DMMP ANTIDEGRADATION EVALUATION ON THE SEDIMENT QUALITY OF THE PROPOSED POST-DREDGE SEDIMENT SURFACE TO VERIFY COMPLIANCE WITH THE WASHINGTON STATE ANTIDEGRADATION POLICY FOR THE FAIRWEATHER BAY DREDGING PROJECT (NWS-2009-1482).

**1. Introduction**. This memorandum reflects the consensus determination of the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the Environmental Protection Agency) regarding the quality of the sediment surface remaining after dredging the Fairweather Bay at the Fairweather Bay Boat Basin. The project area is on the eastern side of Lake Washington, near Hunts Point (Figure 1). This project involves maintenance dredging up to 10,000 cy of material from the access channel into the boat basin. The dredged material will be dewatered and then trucked to an upland disposal site. Because this project does not involve in-water disposal, only a permit issued pursuant to Section 10 of the Rivers and Harbors Act is required from the Corps of Engineers.

**2. Background**. This project was last dredged in 1993. At that time limited sampling and testing was performed to determine that the material was not hazardous waste, for upland landfill information. Sampling and testing for the current project was conducted based on information obtained from the Corps and Ecology but without an approved DMMP SAP. Information submitted from the characterization, together with a Tier 1 evaluation, was considered sufficient for evaluating the proposed post-dredge surface.

**Table 1. Project Specifics**

| | |
|---|---|
| Project ranking | Moderate |
| SAP received | No SAP |
| Sampling dates | November 30, 2009 |
| Data report submitted | February 12, 2010 |
| Project last dredged | 1993 |
| Proposed disposal | Upland; no return water |
| USACE Permit Application Number | NWS-2009-1482 |
| DAIS Tracking Number | FWBAD-1-A-O-288 |

**3. Project Sampling**. Sediment cores were taken from a boat with a hand-held coring device on November 30, 2009 (Figure 2). Samples were penetrated to refusal. No Z-samples were taken due to the impervious nature of the below-dredge surface. Core samples were submitted to Fremont Analytical in Seattle, WA for chemical analysis.

**4. Chemical Analysis**. Four core samples were analyzed for gasoline, diesel and heavy oil, semi-volatile organic compounds and total metals. Results were compared to freshwater screening levels from the 2006 Interim Final Sediment Evaluation Framework (SEF) (Table 2).

**5. <u>DMMP Antidegradation Evaluation</u>**. To evaluate the concern for post dredging surface degradation, chemical results of the proposed dredged material were compared with interim freshwater guidelines from the RSET Sediment Evaluation Framework (RSET 2009). No exceedances of freshwater guidelines for the chemicals of concern were found in the dredged material, and there are no indications that there is increasing contamination with depth. Some DMMP chemicals of concern were not analyzed for in this characterization, including PCBs and dioxins. Tier 1 analysis of the dredge area showed little reason-to-believe for post-dredge surface contamination of either of those classes of chemicals, so no additional sampling was required to verify compliance with state antidegradation standards. However, this evaluation does not support any in-water disposal of dredged sediments.

**6. <u>Upland disposal locations</u>**. The Best Management Practices detailed in the JARPA for dewatering dredged material before upland disposal are encouraged and supported. For further guidance as to potential upland disposal the applicant should consult the local health district for guidance.

**7. <u>References</u>**.

Fremont Analytical, 2009. *Fairweather Bay Dredging Project analytical report*. December 7, 2009

RSET, 2009. *Northwest Regional Sediment Evaluation Framework. .* Northwest Regional Sediment Evaluation Team, May 2009.

8. **Agency Signatures**.

Concur:

4/9/2010
Date

Lauran Cole Warner, Seattle District Corps of Engineers

4/15/10
Date

Justine Barton, Environmental Protection Agency

06/03/2010
Date

Laura Inouye, Washington Department of Ecology

6/3/2010
Date

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**Table 2. Results of Chemical Analysis for Fairweather Bay.**

| | Interim FW SQG | | | | | |
|---|---|---|---|---|---|---|
| **CHEMICAL** | **SL1** | **SL2** | **Sample 1** | **Sample 2** | **Sample 3** | **Sample 4** |
| **METALS** | **mg/kg dry wt.** | | | | | |
| Antimony | --- | --- | nd | 0.3 | nd | nd |
| Arsenic | 20 | 51 | 6.3 | 8.1 | 5.0 | 5.0 |
| Cadmium | 1.1 | 1.5 | 0.25 | 0.47 | 0.40 | 0.25 |
| Chromium | 95 | 100 | 25 | 22 | 39 | 23 |
| Copper | 80 | 830 | 25 | 31 | 22 | 17 |
| Lead | 340 | 430 | 5.6 | 37 | 6.5 | 19 |
| Mercury | 0.28 | 0.75 | nd | nd | nd | nd |
| Nickel | 60 | 70 | 23 | 16 | 42 | 27 |
| Selenium | --- | --- | nd | nd | nd | nd |
| Silver | 2.0 | 2.5 | nd | nd | 0.33 | nd |
| Zinc | 130 | 400 | 63 | 103 | 55 | 37 |
| **ORGANICS** | **µg/kg dry wt.** | | | | | |
| **Total LPAH** | **6,600** | **9,200** | **nd** | **640** | **5** | **811** |
| Naphthalene | 500 | 1,300 | nd | nd | 5.00 | 6.0 |
| Acenaphthylene | 470 | 640 | nd | nd | nd | 15.0 |
| Acenaphthene | 1,100 | 1,300 | nd | nd | nd | 70 |
| Fluorene | 1,000 | 3,000 | nd | nd | nd | 60 |
| Phenanthrene | 6,100 | 7,600 | nd | 190 | nd | 340 |
| Anthracene | 1,200 | 1,600 | nd | 450 | nd | 320 |
| 2-Methylnaphthalene | 470 | 560 | nd | nd | nd | 5.0 |
| **Total HPAH** | **31,000** | **55,000** | **nd** | **3,280** | **nd** | **3,655** |
| Fluoranthene | 11,000 | 15,000 | nd | 450 | nd | nd |
| Pyrene | 8,800 | 16,000 | nd | 390 | nd | 650 |
| Benzo(a)anthracene | 4,300 | 5,800 | nd | 150 | nd | 1150 |
| Chrysene | 5,900 | 6,400 | nd | 220 | nd | 500 |
| Benzofluoranthenes (b+j+k) | 600 | 4,000 | nd | 250 | nd | 250 |
| | --- | --- | | | | |
| | --- | --- | nd | 420 | nd | 380 |
| Benzo(a)pyrene | 3,300 | 4,800 | nd | 170 | nd | 170 |
| Indeno(1,2,3-c,d)pyrene | 4,100 | 5,300 | nd | 1100 | nd | 490 |
| Dibenz(a,h)anthracene | 800 | 840 | nd | nd | nd | 15 |
| Benzo(g,h,i)perylene | 4,000 | 5,200 | nd | 130 | nd | 50 |
| **CHLORINATED HYDROCARBONS** | **µg/kg dry wt.** | | | | | |
| 1,3-Dichlorobenzene | --- | --- | nd | nd | nd | nd |
| 1,4-Dichlorobenzene | --- | --- | nd | nd | nd | nd |
| 1,2-Dichlorobenzene | --- | --- | nd | nd | nd | nd |
| 1,2,4-Trichlorobenzene | --- | --- | nd | nd | nd | nd |
| Hexachlorobenzene (HCB) | --- | --- | nd | nd | nd | nd |

| | Interim FW SQG | | | | | |
|---|---|---|---|---|---|---|
| **CHEMICAL** | **SL1** | **SL2** | **Sample 1** | **Sample 2** | **Sample 3** | **Sample 4** |
| **PHTHALATES** | **µg/kg dry wt.** | | | | | |
| Dimethyl phthalate | 46 | 440 | nd | nd | nd | nd |
| Diethyl phthalate | --- | --- | nd | nd | nd | nd |
| Di-n-butyl phthalate | --- | --- | nd | nd | nd | nd |
| Butyl benzyl phthalate | 260 | 370 | nd | nd | nd | nd |
| Bis(2-ethylhexyl) phthalate | 220 | 320 | nd | nd | nd | nd |
| Di-n-octyl phthalate | 26 | 45 | nd | nd | nd | nd |
| **PHENOLS** | **µg/kg dry wt.** | | | | | |
| Phenol | --- | --- | nd | nd | nd | nd |
| 2-Methylphenol | --- | --- | nd | nd | nd | nd |
| 4-Methylphenol | --- | --- | nd | nd | nd | nd |
| 2,4-Dimethylphenol | --- | --- | nd | nd | nd | nd |
| Pentachlorophenol | --- | --- | nd | nd | nd | nd |
| **MISCELLANEOUS EXTRACTABLES** | **µg/kg dry wt.** | | | | | |
| Benzyl alcohol | --- | --- | nd | nd | nd | nd |
| Benzoic acid | --- | --- | nd | nd | nd | nd |
| Dibenzofuran | 400 | 440 | nd | nd | nd | nd |
| Hexachloroethane | --- | --- | nd | nd | nd | nd |
| Hexachlorobutadiene | --- | --- | nd | nd | nd | nd |

**Notes:**

- All non-detects were at or below Interim FW SQGs
- 2-Methylnaphthalene is not included in sum of LPAHs

# iMAP

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