



THE STATE  
of **ALASKA**  
GOVERNOR BILL WALKER

Department of Environmental  
Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites Program

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August 26, 2015

Via electronic and regular mail

Mr. Chad Gubala, PhD  
Gubala Consulting, Inc.  
108 Elliot Street, Suite 244  
Whitehorse, Yukon Y1A 6C4

RE: Sediment Characterization Report Skagway Ore Dock and Small Boat Harbor  
Site name: Skagway (Nahku) Ore Terminal  
Hazard ID # 300

Dear Mr. Gubala,

The Alaska Department of Environmental Conservation, Contaminated Sites Program (DEC) has reviewed the *Sediment Characterization Report Skagway Ore Dock and Small Boat Harbor Dredging* (Report), dated June 2015, and received electronically on June 24, 2015. Anchor QEA Inc. (Anchor) completed the Report for the Municipality of Skagway (MOS) to document environmental sampling and analysis in support of the Gateway Intermodal Dock Redevelopment Reconstruction Project, the Legacy Harbor Contaminant Mitigation Program (Ore Dock), the expansion of the Small Boat Harbor (SBH), and to obtain geotechnical data on the adjacent upland Skagway Ore Terminal (SOT) facility upland property.

The Report describes sampling and analysis completed by Anchor in accordance with the Sampling and Analysis Plan (SAP) approved by the US Army CORPS of Engineers (USACE) and DEC on October 16, 2014. The SAP included sampling in three areas of Skagway: 1) the sediment area offshore of the Skagway Ore Dock (Ore Dock); 2) the Small Boat Harbor (SBH) and 3) the SOT property. The SAP presented dredged material management units (DMMU) developed to cover the theoretical maximum extent of dredging considered prior to data collection. DEC approved adding sampling and analysis of subsurface soils in the SOT upland property to provide additional environmental and geotechnical information.

Anchor recommends using the Sediment Cleanup Objectives (SCOs) as cleanup levels for the Ore Dock and SBH sediments. The SCOs are conservative marine sediment cleanup levels from the Washington Sediment Management Standards (SMS; Chapter 173-204 Washington Administrative Code [WAC], 2013 revision). The SCOs are based on the marine dry weight Apparent Effects Thresholds (AETs) that represent the lowest concentration at which toxic effects are observed for benthic communities relevant to Puget Sound (Barrick 1988). The SCOs are identical to the AETs,

except for hydrophobic organic contaminants, which are based on carbon-normalized values. For these contaminants, carbon-normalized thresholds are thought to generally provide a better estimate of benthic toxicity than dry-weight values, however, total organic carbon (TOC) levels were measured as low for the Ore Dock and SBH sediment samples (i.e., below 0.5%). Therefore, the SCOs (which are equivalent to the AETs in low TOC sediment) were selected as appropriate and relevant cleanup level goals for this Project.

#### ORE DOCK SEDIMENTS

The Report concludes that the Ore Dock sediment sampling results indicate impacts are typically present in the initial four feet below the harbor floor, are concentrated in the area adjacent to the former Ore Dock conveyor system (e.g., SOD-01, -02, and -03 in Figure 5), and include elevated levels of metals (primarily cadmium, lead, mercury, and zinc) and polyaromatic hydrocarbon (PAH) compounds. To address these impacts, a preliminary remedial dredge footprint (Figure 7a) was developed to remove all sampled sediments with metals and/or PAH concentrations exceeding the SCOs. The horizontal extent of the dredge area is based on the midpoint between samples above the SCO and nearby samples without any SCO exceedances. The vertical extent of the dredge area was established below the deepest extent of any sample interval exceeding the SCO.

It is unclear from the data whether the sediment core SOD-04 sample with a tributyltin (TBT) concentration of 140 micrograms per kilogram (ug/kg) actually represents an elevated risk to benthic invertebrates. Since concentrations of other metals and PAHs are below the SCOs, the Report recommends no remedial dredging of the area surrounding SOD-04 is currently proposed.

In the Report, Anchor estimates the dredge volume, including a 1-foot payable overdredge and exterior side slopes, is approximately 17,300 cubic yards. Exterior side slopes include a 2 horizontal to 1 vertical (2H: 1V) slope toward the SOT and 2.5H: 1V daylight slopes elsewhere. The extent of dredging, including the inclusion and grade of slopes, will be refined during design and presented in a forthcoming Project Basis of Design Report (BODR).

#### SMALL BOAT HARBOR (SBH) SEDIMENTS

The purpose of the SBH investigation was to support planned dredging in the SBH that would provide expanded access for vessels, meet moorage needs, and generate additional wharf fill material; however, at the time of this report, no dredging is currently planned at the SBH. All samples from the SBH are below SCOs. Select SBH sediment samples were also investigated for potential impacts from a historically buried military fuel pipeline; SBH samples collected downgradient of this area are non-detect for gasoline range (GRO) hydrocarbons, contain low levels (i.e., all below 100 mg/kg and most below 30 mg/kg) of diesel range (DRO) and residual range (RRO) hydrocarbons, and did not have visible sheens during sampling. Additional evaluation of these sediment data may be conducted in the future depending on future dredging needs in the SBH.

#### ORE TERMINAL PROPERTY

Metals, PAHs, GRO, DRO and RRO concentrations for all samples collected in the seven soil borings advanced on the SOT property (except one; G-8-0-2) are below Method Two soil screening levels except sample G-8-0-2 (from 0 to 2 feet bgs) which had a lead concentration of 1,030 milligrams per kilogram (mg/kg) above the soil screening level (400 mg/kg). Anchor recommended additional evaluation of these soil data be conducted in the future depending on the location and

specific concentrations of any upland expansion activities and ultimate soil relocation/disposal activities.

#### CONTAMINATED SEDIMENT REMEDIAL CHARACTERIZATION

Anchor generated sediment elutriate samples through the marine and fresh water Sediment Batch Leach Test (SBLT) to measure the potential for dredged sediments to leach metals or PAHs to fresh or marine waters. The objective is to provide a conservative estimate whether dredged contaminated materials from the Ore Dock would be suitable for beneficial reuse as fill in a marine environment or at an upland location in Skagway. Based on screening analytical results with regulatory benchmarks, Anchor concludes that the dredge material from the Ore Dock are unsuitable in their current state for direct placement as fill in the marine environment or as upland fill that would be exposed to freshwater sources. Methods of remedial treatment of contaminated dredge materials have demonstrated the potential to reduce the leachability of lead to levels below the appropriate marine and fresh water criteria but no specific placement area or location has been identified to date. Remedial stabilization treatment of dredge material composites will be coordinated with the agencies and evaluated as part of a future Treatability Study.

Toxic Characteristic Leaching Procedure (TCLP) metals analysis of all four of the composite Ore Dock samples within the proposed dredge footprint (i.e., from stations SOD-01, -02, -03, and -05) had concentrations that exceed the Resource Conservation and Recovery Act (RCRA) thresholds for lead (5.0 mg/L). The results characterize the sediments as hazardous waste upon dredging. Based on the designation as hazardous waste, untreated dredged materials from the Ore Dock area in their current state would require disposal at a Subtitle C landfill; the nearest is located in Oregon. Similar to the other reuse scenarios, treatment of the dredged materials on site has the potential to reduce the TCLP results to below the federal thresholds.

DEC concurs with the Report conclusions and recommendations with the following comments:

1. In accordance with 18 AAC 75.340(i)(2)(B), 75.345(d) and 18 AAC 70.020 (b)(23) regulations, DEC concurs with the recommended use of the Puget Sound Apparent Effect Level concentrations as sediment cleanup objectives for the Skagway Ore Terminal and Small Boat Harbor sites.
2. Based on available information from the DEC Data Quality Checklists, field and sample data quality appear to be acceptable pending comparison with the actual sample laboratory reports.
3. As many previous sampling events have indicated, concentrations of metals in samples collected from marine sediments near the ore dock conveyor are elevated and metals concentrations generally decline with horizontal and vertical distance from that location. The Anchor Report states that lead, cadmium, zinc, silver and mercury are the most significant metals exceeding the SCOs in samples from the upper 2.5-foot depth interval of borings SOD-01, SOD-02, and SOD-03 and the 0-4 ft SOD-DMMU-1-2 composite sample collected under the ore dock conveyor. Since they are below the SCOs, the Report does not discuss copper concentrations in these upper layer discrete and composite samples from that location. The copper concentrations in the 2.5-depth interval of borings SOD-01, SOD-02, and SOD-03, and the 0-4ft SOD-DMMU-1-2 composite sample however, are above the TELs and have increased significantly when compared with sample MS-4 collected under the ore terminal conveyor for the 2006 USR Environmental Monitoring Report.

4. PAH, DRO and RRO concentrations in the upland subsurface samples are, with one exception, below Method Two soil cleanup levels. Comparing the results for samples from borings located upgradient of groundwater flow under the ore terminal facility with samples in borings G06, and G07, that are downgradient of groundwater flow from the ore terminal, a pattern of increase in low concentrations of PAHs, DRO and RRO are indicated.

Based on information in the Report, DEC requests the following:

1. Submit copies of the laboratory reports. A compact disc accompanying a hard copy of Report is acceptable.

### CSP Report Approval

The number of representative samples collected is acceptable and the precision, accuracy and completeness of the resulting analytical data appear to be acceptable, though laboratory reports were not provided. In accordance with Title 18 Alaska Administrative Code (AAC) 75.360, qualified person(s) used data collection and field methods consistent with DEC methodology in the approved sampling plan. The DEC laboratory report checklists submitted are acceptable and the data appear to meet field and laboratory report quality assurance criteria in Contaminated Sites Program guidance documents, therefore the Report is approved in accordance with 18 AAC 75.335(d). I am the DEC project manager assigned to the site and can be reached at 410 Willoughby Suite 302 in Juneau by telephone at 907-465-5210 or by email at [bruce.wanstall@alaska.gov](mailto:bruce.wanstall@alaska.gov).

Sincerely,



Bruce Wanstall  
Remedial Project Manager  
Contaminated Sites Program

cc: Randy Vigil, Project Engineer, US Army Corps Engineers, via email  
Chris Meade, EPA Water Quality, via email  
Mike Schaefer, Mayor of Skagway, via email  
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