

Updates to DMMP Disposal Site Monitoring Triggers in Puget Sound

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Introduction

The Dredged Material Management Program (DMMP) manages a network of open-water disposal sites in Washington State. The sites receive dredged material determined to be suitable by testing and evaluation under the oversight of the DMMP agencies. The DMMP monitors five non-dispersive disposal sites in Puget Sound for physical, chemical and biological impacts. Monitoring verifies the disposed material stays within the site boundary and determines whether unacceptable adverse effects are occurring within or beyond the disposal site boundaries.

The frequency of monitoring is site-specific and is evaluated and adjusted as necessary based on previous monitoring results and frequency of site use. This paper serves to correct conflicting historical site monitoring trigger documentation. The monitoring triggers for the Bellingham Bay and Anderson/Ketron sites are proposed to be set at a volume of 150,000 cy, and the temporal triggers set in 2002 will be removed.

Background and History

In 1988 the Puget Sound Dredged Disposal Analysis (PSDDA) study (precursor to today's DMMP) recognized that an environmental monitoring program would be needed to "field verify the PSDDA predictions of site conditions following disposal." Site management conditions allow up to "minor adverse effects" on biological resources that may be present or move across the site (PSDDA, 1988).

The PSDDA study first monitored the disposal sites for baseline conditions in 1989, and then planned for subsequent monitoring when a site reached 100,000 cy of disposed material. The projected monitoring schedule (Table 7.2) from the 1988 and 1989 PSDDA documents contained both full and partial monitoring events that "may be adjusted if insufficient material is deposited at a site to warrant full study" (PSDDA, 1988). The 1989 PSDDA document further clarifies that "monitoring efforts will only take place after the sites have been used and volumes are sufficient to reasonably expect that observable changes will be present" (PSDDA, 1989).

This adaptive management approach to monitoring is still used today. Sites are evaluated at the end of each dredge year to determine the need for either full or partial monitoring based on disposal activity and cumulative volume. Since the 1988/1989 program inception, the DMMP has issued three clarification papers to adjust monitoring triggers allowing for greater placement volumes at sites between monitoring events. The exceptions to this are the Bellingham Bay and Anderson/Ketron sites where infrequent use seldom initiated the volume trigger. As a result, a 2002 clarification paper instituted a temporal trigger of 15 years for both sites, though the volume trigger from that point forward is somewhat unclear as discussed below.

Document Summary:

- 1996 Clarification - DMMP increased the Port Gardner, Elliott Bay and Commencement Bay volume triggers to 300,000 cy. No change was made for Anderson/Ketron or Bellingham Bay (DMMP, 1996).

- 2002 Clarification - DMMP increased the Port Gardner and Elliott Bay volume triggers to 500,000 cy, with no change to Commencement Bay. The paper states, “The most recent increase in the trigger-volume occurred in 1996, when it increased to 300,000 cy,” thus the 2002 paper alludes to a volume trigger of 300,000 cy for all sites. However, there is no specific statement of the volume triggers for Anderson/Ketron and Bellingham Bay, resulting in confusion about the volume triggers for those two sites. This was further exacerbated by the ensuing DMMP biennial reports which began listing the monitoring trigger for Anderson/Ketron and Bellingham Bay sites as 300,000 cy.

The 2002 paper also introduced the “temporal trigger” for Anderson/Ketron and Bellingham Bay. The plan was to monitor these two sites approximately every 15 years. As stated, the DMMP “...will consider conducting periodic monitoring at both of these relatively low use sites [Bellingham Bay and Anderson/Ketron] in the future, based on a temporal trigger. That trigger will be approximately 15 years, and is established with the goal of updating baseline data and verifying that baseline conditions have not changed since the implementation of the program in 1988. This strategy will be modified as site-specific conditions require” (DMMP, 2002).

- 2006 Clarification - DMMP increased the Commencement Bay volume trigger to 500,000 cy (DMMP, 2006).
- 2007 Updated Environmental Monitoring Plan (UEMP) – The UEMP specified a volume trigger of 500,000 for Port Gardner, Elliott Bay and Commencement Bay; a volume trigger of 150,000 cy was listed for Anderson/Ketron and Bellingham Bay (DMMP, 2007).

Problem Statement

The monitoring triggers for the Bellingham Bay and Anderson/Ketron disposal sites are stated in several documents with conflicting information. Following the 2002 decision to impose a 15 year temporal trigger on the sites, the 2002/2003 Biennial Report stated that the volume trigger for these sites is 300,000 cy; however the 2007 UEMP specified the volume trigger for the sites at 150,000 cy. The current understanding of the monitoring triggers for the Bellingham Bay and Anderson/Ketron sites is 15 years or 300,000 cy, whichever occurs first.

Monitoring history has shown that, within about a year of placement, dredged material undergoes bioturbation and becomes nearly indistinguishable from the existing sediment in Sediment Profile Imaging (SPI) studies, therefore temporal triggers are no longer considered helpful to the program, and site-specific triggers for Bellingham Bay and Anderson/Ketron need clarity.

Bellingham Bay: The most recent disposal at the Bellingham Bay site was in 1998. The site was last partially monitored in 1993 and has since received a cumulative total of 46,000 cy. This site is currently inactive, and no disposal is anticipated in the near future. Should use of this site resume, an assessment of the need for a new baseline study will be made at that time. Until then, it is not scientifically or economically feasible to monitor the Bellingham Bay site until sufficient volume warrants a study.

Anderson/Ketron: The Anderson/Ketron site has been used periodically. The most recent disposal was in 2014. The site was last monitored fully in 2005 and has since received a cumulative total of 129,776 cy. In 2014/2015 a significant benthic trawl study was conducted to address concerns about habitat changes and verified that benthic habitat quality at the site had not significantly changed since the baseline study establishing the site in 1989.

Proposed Clarification

The DMMP reviewed the need, efficacy, and usefulness of site monitoring triggers and proposes removing the temporal trigger of 15 years and clarifying a volume trigger of 150,000 cy for the Bellingham Bay and Anderson/Ketron sites. The conditions and site use history of Bellingham Bay and Anderson/Ketron warrant monitoring when there is enough material disposed for physical, chemical and biological monitoring to detect changes in site conditions. Recent dredged material must be present at the disposal site to be able to delineate the disposed material during physical monitoring. The sites should also be monitored frequently enough to detect chemical and biological impacts; therefore, a volume trigger of 150,000 cy is sufficient to meet the DMMP monitoring objectives.

The DMMP proposes volume-based monitoring triggers for all five non-dispersive open-water disposal sites in Puget Sound as shown in the table below. A temporal trigger for Anderson/Ketron and Bellingham Bay sites will no longer be used.

Disposal Site	Monitoring Trigger (cubic yards)
Anderson/Ketron	150,000
Bellingham Bay	150,000
Commencement Bay	500,000
Elliott Bay	500,000
Port Gardner	500,000

References

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