Recommended Overdepth for Sediment Characterizations and Updated Trigger Requirements For Z-Layer Analysis

Prepared by the Dredged Material Management Program agencies.

Introduction and Purpose

As presented in both the 2023 and 2024 Sediment Annual Review Meetings, non-compliance occurrences with United States Army Corps of Engineers (USACE) issued dredging permits[1], associated Washington State Department of Ecology Section 401 Water Quality Certifications[2], and Department of Natural Resources Site Use Authorizations have increased in recent years. Non-compliance occurrences can span a wide range of actions including unauthorized dredging, overdredging (beyond the permitted depth/width), debris management, transloading, mis-placement of material, and failure to follow best management practices in approved project plans. The most common non-compliance issue is dredging beyond permitted depth or width (i.e., overdredging).

Overdredging can result in a project exceeding its permitted dredge and disposal volumes, but it can also expose post-dredge surfaces that have not been characterized. The newly exposed surface may have known or potential sediment contamination. Compliance with the Washington State antidegradation policy[3] requires that characterization depths must be representative of post-construction dredge depths.

Most dredging projects typically propose a 2-foot (ft) overdepth (OD) allowance to allow for a reasonable amount of imprecision in the physical dredging process; however, some projects propose a 1-ft OD allowance. Projects with a 1-ft OD allowance are at a higher risk for non-compliance issues due to the smaller tolerance allowed for dredging error. Dredging within a smaller vertical tolerance requires a higher level of dredging skill and precision, which may be difficult to achieve for several reasons, including:

- Speed vs Accuracy Trade-offs. Dredging contractors aim to be as efficient as possible to minimize project costs and maximize volume removed, especially for contracts based on a per cubic yard of material dredged. Increasing production rates can result in reduced dredging accuracy. Higher accuracy (< 1 ft) can be achieved but typically requires an experienced dredging operator, on-site tide gauge, specialized equipment (level cut buckets), and slower dredging cycles, which all increase costs.
- Presence of large debris. When large debris is present (often near rock armored slopes or when derelict piles are present), a depression or "hole" may be left behind when the

[1] Clean Water Act (CWA) Section 404
[2] CWA Section 401
[3] WAC 173-200-030 and 40 C.F.R. § 131.12

object is removed, which can result in post-dredge depths below characterized and/or permitted depths.

The Dredged Material Management Program (DMMP) User Manual (DMMP, 2021) requires applicants to include OD material in total proposed dredge design volumes and characterization depths but does not require a specific OD minimum. The purpose of this paper is to provide guidance for dredge material sediment characterizations that propose less than the standard 2-ft OD allowance.

Useful Terms

The following are common terms used for defining dredge depths:

- Operational depth or desired project depth – the depth requested or required by the project proponent for operation of the facility.
- Allowable Overdepth (OD) – Allowable OD is additional depth and/or width outside the required dredge prism to allow for inaccuracies in the physical dredging process. Allowable OD is determined by the project proponent and is typically two feet. Overdepth must be included in both the sediment characterization and associated permits.
- Characterization depth – This is the deepest depth to which an area has been or will be characterized. This may differ across a project area.
- Permitted depth – This is the maximum dredging depth allowed under various permits and certifications. For a project with +2 ft of OD, this can look like, "-47 ft MLLW, which includes -45 ft + 2 ft OD."
- Z-layer/Leave Surface – This is the post-dredge surface that is exposed (or expected to be exposed) after dredging. A representative sample of the Z-layer (Z-sample) is collected during sediment sampling for potential antidegradation evaluation.

Current Guidance

The existing 2021 DMMP User Manual (DMMP, 2021) currently requires characterization of the entire dredge prism (operational depth plus allowable OD); collection of a Z-sample (2-ft sample taken below the dredge prism) is recommended but not required. If there is an exceedance in the overlying dredge prism, the Z-sample must be analyzed to demonstrate antidegradation compliance or post-dredge actions may be required (e.g., sand cover layer). The User Manual does not specify how much OD to include in the overall characterization depth and assumes that the permitted depth and characterization depth would be the same.

Clarification

The DMMP agencies recommend that dredging project applicants include a minimum of two feet overdepth in the project characterization depth, even if the proposed permitted depth includes less than two feet of overdepth. The DMMP agencies will use this information to evaluate potential non-compliance impacts to disposal and water quality if overdredging occurs.

If the applicant chooses to characterize less than two feet of overdepth, the applicant must collect and analyze the underlaying Z-layer samples[4] concurrently with the dredge prism characterization samples to facilitate evaluation of overdredging risks prior to dredging (Figure 1).

Concurrent Z-layer analysis could be waived for special cases based on:

- Availability of historical Z-layer data to verify that there is no contamination
- Known native interface
- Project rank

Note that **permit compliance is based on permitted depth**. Applicants that request +1 feet of OD for their permit and dredge beyond that limit will be out of compliance with their dredging permit. Non-compliance corrective actions will be determined based on project-specific factors but can include additional sampling, sand cover layer and/or fines.

In summary, this paper provides the following clarification to the DMMP guidance:

- DMMP recommends that dredging projects include a minimum 2 feet of overdepth in the project characterization depth.
- If the OD included in the characterization is 2 or more feet, analyze the Z-layer in accordance with existing guidance (analyze only if the overlying DMMU exceeds DMMP screening levels).
- If the OD included in the characterization is less than 2 feet, analyze the Z-layer concurrently with the overlying dredge prism Dredged Material Management Units (DMMUs).

References

DMMP 2021. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Dredged Material Management Program, updated July 2021.

[4] The DMMP agencies will determine if individual Z-samples or Z-sample composites are warranted based on available information.

Figure 1: Illustration of Overdepth Characterization Scenarios and Z-layer Sample Analysis Requirements