



US Army Corps
of Engineers®
Portland District

MCR North Head Pilot Placement Study (DRAFT)

Objective: Determine how quickly MCR dredged material disperses after placement in the North Head Site (NHS).

Location: Pacific Ocean, off the North Head, near Long Beach, Pacific County, Washington.

Equipment: Government hopper dredge ESSAYONS; government survey vessel ELTON.

Method: To determine how quickly dredged material disperses from the NHS, the Corps proposes to intentionally mound dredged material in a linear berm within the NHS study area (see map on next page). The recommended minimum height berm height is 2 ft. to be measureable by a multibeam (MB) hydrographic survey.

Prior to dredged material placement by the ESSAYONS, the ELTON will perform a MB survey to determine pre-placement bathymetry.

In a 24 hour period, the ESSAYONS will dredge 6 to 7 loads (up to 35,000 cubic yards) from the MCR federal navigation channel and place the material in a linear sand berm tall enough to be measured by MB survey. Each load would be dumped along the same line to build up a measureable berm.

Within 8 hours of disposal of the last load, the ELTON will perform a post-placement MB survey over the pilot study area. To evaluate the status of the berm, the ELTON will perform another MB survey of the study area 1 month after placement. If the berm persists and weather allows, another MB survey may be performed 2 months after placement.

Field Schedule: The pilot placement and pre-/post-placement MB surveys are scheduled for early August 2018; the one-month post-placement MB survey is scheduled for early September. If the berm persists one month after placement, another post-placement survey may be performed at the 2-month interval if weather and schedule allows (in early October). The area will definitely be surveyed in late spring 2019, prior to the dredging season.

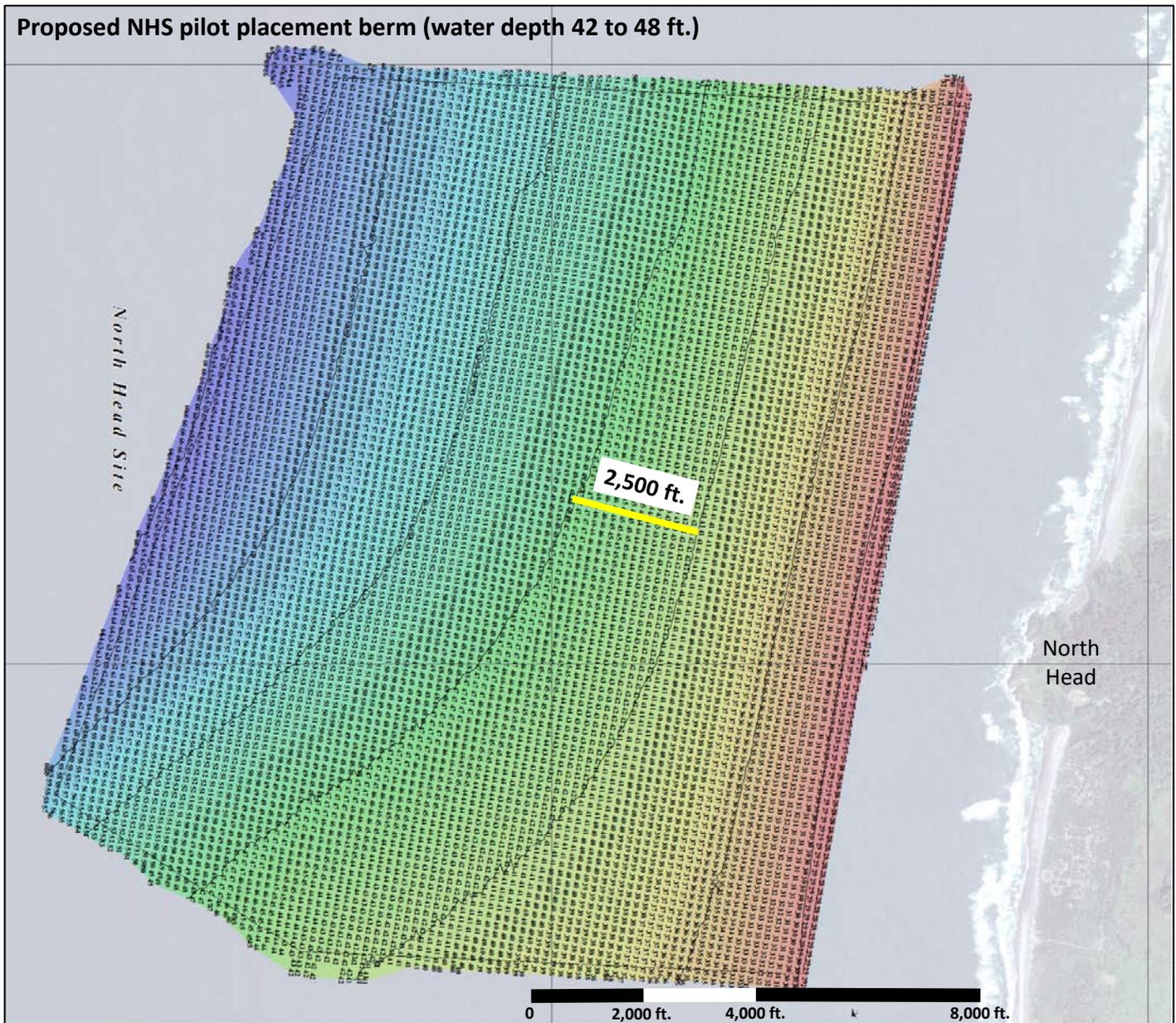
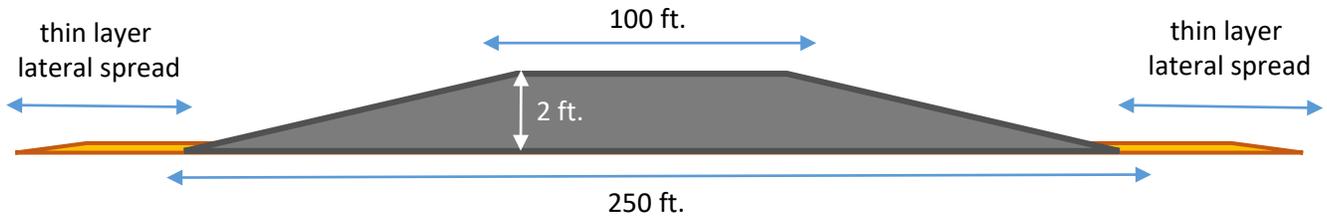
Reporting: The date(s) of the pilot placement by the ESSAYONS will be communicated to the Lower Columbia Solutions Group stakeholders; MB surveys will be provided as they become available. A report describing the 2018 findings of the pilot placement study will be provided to the LCSG stakeholders by the end of December 2018.

2012 Deposition Study: A dredged material deposition study was performed by Moritz et al. (2013) at the MCR South Jetty Site (Pacific Ocean, Clatsop County, Oregon) in 2012. The purpose of the study was to determine the thickness of nearshore dredged material placement by the government hopper dredge ESSAYONS and evaluate localized impacts to the benthic and epibenthic communities. Approximately 15,000 cy (3 loads) of dredged material were placed along a 5,000 ft. transect by the ESSAYONS in 50 ft. of water. Maximum deposition along the 5,000 ft. transect was approximately 3.5 inches, and lateral spread of the dredged material was 350 to 500 ft., with the bulk of deposition occurring a 250-ft. swath. Deposition was thickest at beginning of the dump.

Assumptions for NHS Pilot Placement: The ESSAYONS can dredge and dump 35,000 cy in 6 to 7 loads. The objective of this study is to mound material at the NHS to a height of 2 ft. along a linear berm. Based on Moritz et al. (2013), we estimate that the 2 ft. mound will be ~250 ft. at the base, with a top width of ~100 ft. We also assume that ~5% (1,750 cy) of the material will spread in a thin layer outside of the 250 ft.-wide berm. Refer to the conceptual cross sectional figure, below.

Berm Length Calculations: What is the length of a 33,250 cy, 2 ft. thick berm of dredged material? The cross section below is provided for illustrative purposes.

$$\begin{aligned} \text{Convert cy to cf: } & 33,250 \text{ cy} \times 27 \text{ ft}^3/\text{cy} = 897,750 \text{ ft}^3 \\ \text{Cross sectional area of berm: } & 2 \text{ ft.} \times (100 \text{ ft.} + 250 \text{ ft.})/2 = 350 \text{ ft}^2 \\ \text{Berm length: } & 897,750 \text{ ft}^3 / 350 \text{ ft}^2 = \mathbf{2,565 \text{ ft.}} \end{aligned}$$



Reference: Moritz, H.R., J. Norton, M. Ott, G. Smith, and C. Roegner. 2013 [poster presentation]. The physics of dredged material placement in nearshore waters: as observed by crab. <https://www.eposters.net/pdfs/the-physics-of-dredged-material-placement-within-nearshore-waters-as-observed-by-crab.pdf>