Appendix F

Yaquina Bay
North and South
Ocean Dredged Material Disposal Sites

Site Management/Monitoring Plan

2012

This Site Management/Monitoring Plan has been prepared jointly by the U.S. Environmental Protection Agency, Region 10, and the U.S. Army Corps of Engineers, Portland District, and describes management and monitoring requirements for the EPA-designated ocean dredged material disposal sites located offshore of Yaquina Bay in Oregon.

Yaquina Bay ODMDS
Site Management/Monitoring Plan

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Introduction

This Site Management/Monitoring Plan (SMMP) was jointly prepared by the U.S. Environmental Protection Agency, Region 10 (EPA), and the U.S. Army Corps of Engineers, Portland District (USACE). This SMMP describes management and monitoring requirements for the EPA-designated Yaquina Bay North and South Ocean Dredged Material Disposal Sites (ODMDS) located offshore of Yaquina Bay in Oregon, hereafter referred to as the Yaquina Bay ODMDS or Yaquina Bay Sites or Sites (Figure F-1). This SMMP becomes effective upon the effective date of the site designation and supersedes and replaces any previous SMMP for this location.

It is the responsibility of the EPA and the USACE to manage and monitor each ODMDS designated by the EPA pursuant to Section 102 of the Marine Protection, Research and Sanctuaries Act, as amended (MPRSA). The EPA has final authority over site management. The SMMP provisions establish requirements for all dredged material disposal activities at each site. All permits issued pursuant to Section 103 of the MPRSA for the ocean disposal of dredged materials at the Yaquina Bay Sites shall be conditioned as necessary to ensure consistency with this SMMP. The USACE shall ensure that its use of the Sites is consistent with this SMMP.

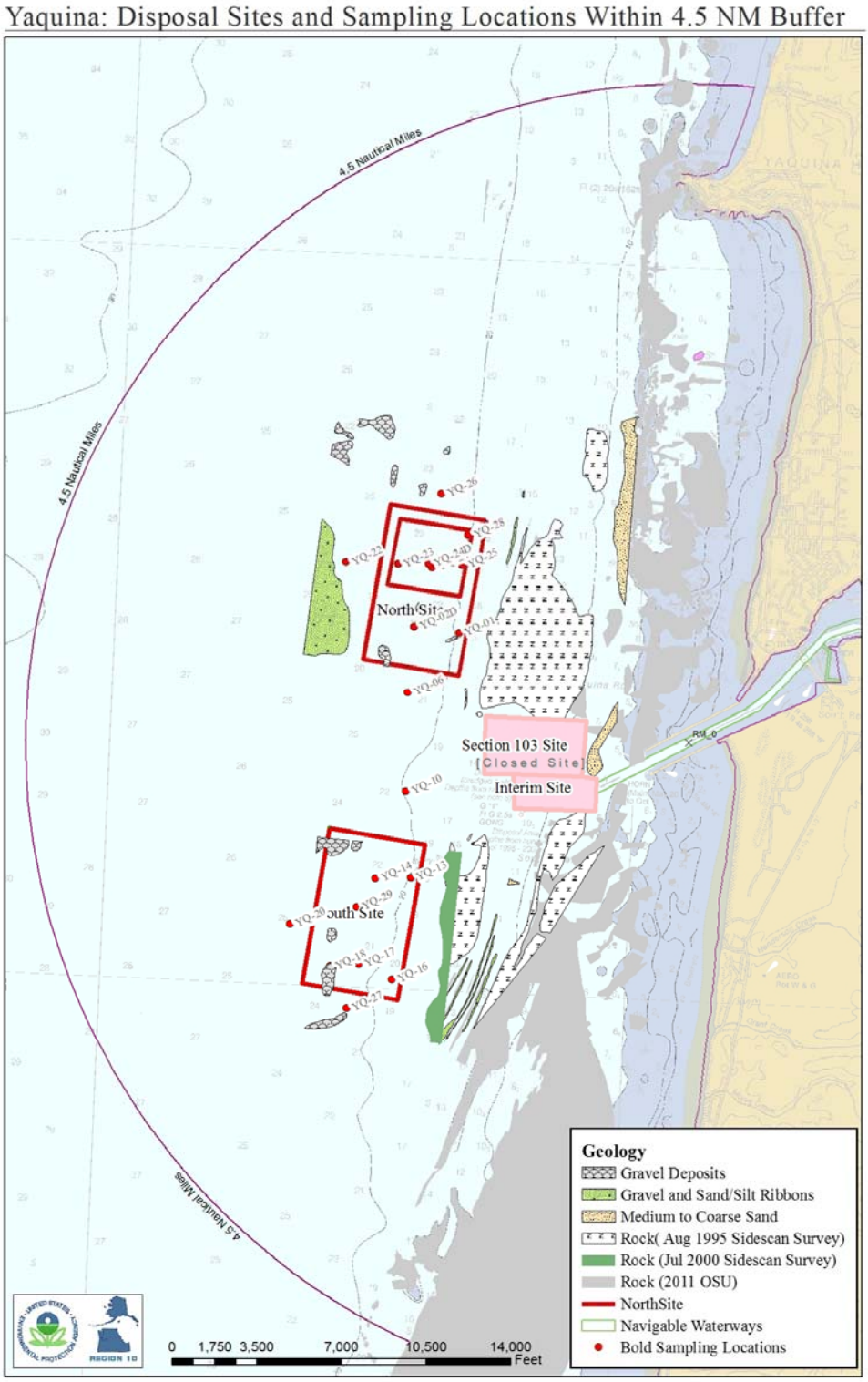
Guidance for the preparation of a SMMP for ODMDS is provided in the joint national EPA/USACE *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites* (EPA/USACE 1996). This guidance document lays out a recommended framework for site management plan development and content.

Each SMMP is required, pursuant to the MPRSA, to include:

- a baseline assessment of conditions at the site;
- a program for monitoring the site;
- special management conditions or practices to be implemented at each site that are necessary for protection of the environment;
- consideration of the quantity of material to be disposed at the site, and the presence, nature, and bioavailability of the contaminants in the material;
- consideration of the anticipated use of the site over the long term, including the anticipated closure date for the site, if applicable, and any need for management of the site after closure;
- a schedule for review and revision of the plan which must be no less frequently than 10 years after adoption of the plan and at least every 10 years thereafter.

Management of ODMDS involves regulating the times, the quantity and the physical/chemical characteristics of dredged material that is dumped at the site; establishing disposal controls, conditions, and requirements to avoid and minimize potential impacts to the marine environment; and monitoring the site environs to verify that unanticipated or significant adverse effects are not occurring from past or continued use of the disposal site and that permit terms are met. Appropriate ODMDS management is aimed at assuring that disposal activities will not unreasonably degrade or endanger human health, welfare, the marine environment or economic potentialities (EPA/USACE 1996).

Figure F-1: Yaquina Bay North and South ODMDS and Vicinity



Site Management Roles and Responsibilities

The designation of ODMDS and the issuance of permits for such sites are components of the federal, non-delegable, ocean dumping program. Site designation and management are federal responsibilities. Owing to the interactive nature of regulating ocean disposal of dredged material, the functional management of ODMDS along the coast of Oregon is shared between the EPA and the USACE. The EPA and USACE will routinely consult on all decisions regarding site use and management. At a minimum, the USACE and the EPA will consult on an annual basis to discuss the annual summary report prepared by the USACE which will discuss disposal activities at the Sites during the prior dredging year, the results of any routine monitoring surveys or specials studies, and the need for any routine monitoring or special studies in subsequent years.

The USACE is expected to be the primary user of the Yaquina Bay Sites for dredged material from the federal navigation project at Yaquina Bay. The USACE also issues permits to other users for transportation of dredged material for the purpose of ocean disposal, after consultation with and concurrence from the EPA, in compliance with these criteria. The USACE must comply with the MPRSA and meet substantive permit requirements, including the EPA concurrence, for its own use of the Yaquina Bay Sites.

The EPA may condition, terminate or restrict site use with cause. The EPA is responsible for managing and monitoring ocean dredged material disposal sites in ocean waters off the States of Alaska, Washington, and Oregon, including the Yaquina Bay Sites addressed in this SMMP.

Yaquina ODMDS History

The need for improved navigation controls in the Yaquina Bay estuary began with the founding of a port city at Yaquina. Because of the navigation need, two rubble mound jetties were constructed in 1896, and Congress authorized dredging in the bay in 1919. For historical annual disposal volumes, see Appendix B (Table B-1; page B-5).
Summary of site use:

- 1919 – 1977. During this period of time, 200,000 to 250,000 cubic yards (cy) of dredged material were disposed in the general area of the Interim Site (Figure F-1).

- 1978 – 1985. During this period of time, all dredged material was placed at the Interim Site (Figure F-1).[1]

- 1986. The USACE selected an alternate ODMDS under its Section 103 authority, Section 103 Site, because of mounding at the Interim Site and the potential adverse effect on navigation safety (Figure F-1).

  Bathymetric monitoring between 1985 and 1988 of the Interim Site found that by 1988 more than 20-feet of material present in 1985 had been removed by natural processes and depth contours had returned to their 1983 condition.

[1] The 1992 MPRSA amendments abolished interim ocean dumping sites. In 2008, EPA's final rule (73 FR 74983 (12/10/2008)) repealed obsolete regulations regarding interim ocean dumping sites, interim ocean dumping permits, and interim ocean dumping criteria.

- 1986 – 1997. During this period of time, all dredged material was deposited at the Section 103 Site. Dredged material continued to accumulate at this site. After 1989, dredged material disposal was restricted to only portions of the Section 103 Site because of continued mounding. In May 1998, the maximum accumulation was 19 feet at an original water depth of approximately 84 feet with all contour lines shifted offshore. For that year, dredged material placement was restricted to the northeast and southwest corners of the site.

- 1998 - 2000. In 1998, the USACE enlarged the Section 103 Site to include the outer two thirds of the former Interim Site. In 1999, material placement was restricted to the new southern portion of the Section 103 Site. In 2000, dredged material was placed in the southwest corner of the Section 103 Site.

- 2001 – Present. In 2001, under the USACE's Section 103 authority, USACE selected two new sites for disposal of dredged material. Based on the historical record of significant mounding in shallower water near the Yaquina Bay entrance channel, the USACE chose two sites rather than one, significantly expanded their size, moved them north and south of the mouth of Yaquina Bay, further away from the entrance channel, and sited them far enough offshore to avoid Yaquina Reef (Figure F-1).

  Since 2001, only the North Site has been used for disposal for the following reasons: 1) use of the North Site was preferred by local fishing interests, the Port of Newport and the dredges; and 2) the prevailing wave climate during the dredge season (waves approaching from the northwest) makes the North Site preferable for use by hopper dredges more often than the South Site.

  Between 2001 and 2009 all dredged material was placed in the northern half of the North Site (drop zone) (Figure F-1). In 2010 the whole 103-selected North site was used while in 2011 the USACE only used the southern half. The only time during this period that another entity besides the USACE disposed at the Yaquina Sites was the Port of Toledo in 2010 (3,000 cy).

Site Definitions and Description

For the purposes of management and monitoring of the designated Yaquina Bay Sites, the following definitions and descriptions are applicable.

Baseline

Section 102(c)(3)(A) of the MPRSA requires that the SMMP include a baseline assessment of conditions at the site. A broad scale assessment of physical, chemical and biological characteristics of this area of the Pacific Ocean encompassing the sites are described in Richardson 1973; Peterson and Miller 1977; Richardson and Pearcy 1977; Brodeur et al., 1985; Keister and Peterson 2003; Auth and Brodeur 2006; Auth et al., 2007. In the area offshore of Yaquina Bay, the USACE has been conducting studies for over 30 years to support the long-history of dredged material disposal going back to 1977. These surveys and studies included bathymetry, benthic grabs, and sediment chemistry at or near the dredged material disposal sites. More specifically, baseline studies for the North and South sites occurred in 1999 and 2000 followed by surveys in 2002 and in 2008 during the disposal season. These studies included bathymetry, sidescan sonar, benthic grabs, and benthic trawl surveys. For the purposes of the discussion of baseline in this SMMP, the focus is on findings from the benthic grabs in the 1999 and 2000 surveys which were prior to any disposal at either site. Details on sampling methodology and

the results of the 2002 and 2008 studies are discussed in detail in Appendix A and Appendix C (pages C-11 to C-24).

These studies provide the EPA with the following: 1) confirmation that the disposal sites are on areas with a sandy substrate of similar-grain sized materials with the majority of material in the federal navigation project (the primary source of material to be disposed at the Sites); 2) confirmation that the material at the sites (native sand and dredged material) are not contaminated and do not pose a risk to benthic organisms (this meets the requirement of Section 102(c)(3)(D) of the MPRSA); 3) a snapshot in time over several years of the benthic infaunal community at and near these sites. The benthic community data, primarily infauna, are used as a gauge for long-term adverse affects with the assumption being that a persistent change of species diversity and abundance at this lower level of the food chain could potentially cause long-term adverse affects to higher trophic levels which include species of higher societal and commercial value.

Of primary concern to the EPA and the USACE is the substrate type at the disposal sites, which dictates the epifaunal community structure in the area. The EPA and the USACE are locating these disposal sites on sandy substrate and by doing so, are avoiding the Yaquina reef complex, a highly valued and unique rocky reef that is found landward of the ODMDS. This rocky reef complex parallels the shore within the ZSF (Figure F-1). Seaward of the reefs recent marine sands 5-35 feet thick form a discontinuous cover over the underlying rock where these sites are located. Further offshore of the Sites, sidescan sonar survey in 2000 showed the presence of gravel deposits and gravel interspersed with sand and silt ribbons (Figure F-1).

To have a baseline of the benthic infaunal community prior to disposal, the USACE surveyed areas within and around the North and South Sites in May and September 1999 and June and September 2000. The USACE took 5 replicate grabs at each of the stations. The stations discussed here are those that are within the North and South Sites. The data gathered outside the designated sites are contained within USACE 2001 and 2003 reports and will be used in future analyses of changes to species abundance and diversity within and outside the disposal sites.

North Site. The May and September 1999 and the June and September 2000 surveys were similar in the number of species found at each sampling location. As for individual abundance, the May and September 1999 survey and the June 2000 were similar in abundance while the September 2000 abundances were orders of magnitude greater. During the September 2000 survey, there appeared a large recruitment of opportunistic short-lived polychaetes, (*Spiophanes bombyx and Megelona sacculate*) into the North Site. The third most abundant species was the anthozoan, Halcampoides sp, a species that had not previously been one of the 5 most abundant species at the sampling locations. Otherwise, the other species with the greatest abundances were polychaetes and a crustacean.

The benthic infaunal species found at the North Site sampling stations that had the greatest abundance were the same in May 1999 (YQ1), September 1999 (YQ1), and June 2000 (YQ1). However, station YQ24 in June 2000 only had one species (in the top 5), in common with the other stations mentioned (the polychaete *Nephtys caecoides*). In September 2000, when benthic infaunal abundance increased greatly at both YQ1 and YQ24 sites, the infauna was dominated by 3 species that had not been seen in 1999 or in June 2000 at YQ 1. These species were observed at YQ24 in June 2000 in the top 5 in the prior 3 surveys (1 polychaete, 1 crustacean, and 1 anthozoan). It does appear that variation in species and their abundance can be fairly site specific. At the two sampling stations in the North Site in June

2000, only 1 out of the 5 most abundant species were the same at both stations.

The 1999 and 2000 September surveys at the two stations within the North site indicated that the dominant species (the polychaete *Spiophanes bombys*) were the same at both stations. Another polychaete (either *Nephtys sp* or *Magelona sp*.) was second most abundant. The third most abundant species was either an anthozoan (*Halcampoides sp.*) or a polychaete (*Notomastus sp*), and either polychaetes or crustaceans filled out the rest of the top 5 most abundant species.

The dominant mollusc genus at the North Site was the carnivorous gastropod, *Olivella*. *Dendraster excentricus,* sand dollar, was not found in high abundance at the North Site whereas they were a dominant species at the stations in the South Site.

South Site. The May and September 1999 and the June and September 2000 surveys were similar in the number of species found at each sampling location. As for individual abundance, the May and September 1999 survey and the June 2000 were similar in abundance while the September 2000 abundances were orders of magnitude greater. During the September 2000 survey, there appeared a large recruitment of opportunistic short-lived polychaetes, (*Spiophanes bombyx* and *Magelona sacculate*). Another species which showed up in September 2000 in high abundances but was not at such levels was the anthozoan, *Halcampoides sp*. Otherwise; the other species with the greatest abundance were polychaetes, a crustacean, and juvenile razor clams at one station.

The benthic infaunal species that had the greatest abundance were very similar in May 1999, September 1999, and June 2000. In September 2000, when benthic infaunal abundance increased greatly at all stations, the infauna was dominated by 3 species that had not been present at high abundance in 1999 or in June 2000. These species were the same top three most abundant species at all 4 stations sampled in September 2000: *Spiophanes bombyx, Magelona sacculata* (polychaetes), *Halcampoides sp.* (anthozoan).

In the May 1999, September 1999, and June 2000, the most abundant species was fairly consistent between seasons and sampling stations. *Dendraster excentricus* (sand dollar), *Notomastus lineatus* (polychaete), *Olivella pycna* (gastropod), *Nemerteinea sp.* (ribbon worm), *Nephtys caecoides* (polychaetes), and *Eohaustorius sencillus* (crustacean) dominated the top five most abundant species. In general, the species abundance and diversity at each station was fairly representative of the community structure at the other stations.

The large abundance increases of particular species at the both the North and South Sites in September 2000 is postulated to have been attributed to upwelling on the Oregon coast (Marine Taxanomic Services 2003). *Magelona sacculate* and *Spiophanes bombyx* are two species that show a marked increase in the population densities in fall 2000. Most of this density increase was attributed to juvenile recruitment.

Disposal Sites

The disposal sites include the sea bottom and overlying water column within the coordinates specified in the applicable *Federal Register* Final Rule designating the individual sites (Table F-1).

Table F-1. Coordinates, Dimensions, and Depths of the Yaquina Bay North and South ODMDS

Yaquina North ODMDS (North American Datum 1983)

44° 38’ 17.98” N, 124° 07’ 25.95” W
44° 38’ 12.86” N, 124° 06’ 31.10” W
44° 37’ 14.33” N, 124° 07’ 37.57” W
44° 37’ 09.22” N, 124° 06’ 42.73” W

Dimensions: 4,000’ width by 6,500’ long
Depth Range: 112-152 feet

Yaquina South ODMDS (North American Datum 1983)

44° 36’ 04.50” N, 124° 07’ 52.66” W
44° 35’ 59.39” N, 124° 06’ 57.84” W
44° 35’ 00.85” N, 124° 08’ 04.27” W
44° 34’ 55.75” N, 124° 07’ 09.47” W

Dimensions: 4,000’ wide by 6,500’ long
Depth Range: 112-152 feet

Placement Area (also called Disposal Area)

The placement area is defined as the area of the sea bottom that will be immediately occupied by disposed dredged material released at the water surface on an annual basis, and/or over the anticipated life of the disposal site. The Yaquina North and South Sites are at depths (greater than 60-feet) where material is not expected to move substantially off the site. Thus, these are considered non-dispersive sites so the material will not remain part of the Newport littoral cell (Appendix B pages B-21 to B-25). Although one of the Corps’ and the EPA’s sediment management objectives is to keep material within the littoral cell, given the nearshore shallow Yaquina reef complex at depths of 45- 50 feet which runs the entire north-south length of the ZSF, it is not possible for dredges to dispose of material safely in the shallow depths that are landward of the reef. Thus, the Yaquina North and South Sites will be managed as sites with a finite lifespan which requires placement to be managed on a seasonal or annual cycle. The EPA and the USACE will need to consider placement of future disposal sites based on the presumed finite capacity of the North and South Sites.

Anticipated Capacity

Section 102(c)(3)(D) of the MPRSA requires that the SMMP include consideration of the quantity of material to be disposed of at the site. A projection of 310,000 cy per year per site (based on past dredging volumes) was used with a 20-year lifespan (typical engineering planning time horizon) to size both of the North and South Sites (see Appendix B, Table B-1 for historic disposal quantities and pages B-21 to B-25). After 10 dredging seasons (2010 bathymetric surveys), smaller areas near the center of the North Site drop zone have mounded 10-12 feet above the 2001 baseline bathymetry while in the rest of the drop zone, mounding ranges from 2 to 10 feet. This is less than the 14-foot design height for the 20-year site life discussed in detail in Appendix B (pages B-35 to B-37). This indicates that due to reduced quantities of material dredged in the last ten years and proper management of the placement of the material, the site life of the disposal sites may be longer than the original 20 year use-period as calculated in 2001 particularly if the trend of reduced disposal volumes over historical levels continues. The South Site has all of its original capacity remaining.

Anticipated Site Use

Section 102(c)(3)(E) of the MPRSA requires that the SMMP include consideration of the anticipated use of the site. Primary and regular use of the Yaquina Bay Sites is expected by the USACE for the disposal of dredged material removed from the federal navigation project on an annual maintenance schedule. It is also expected that the sites will be used for disposal of material dredged by other public or private entities pursuant to a permit as required by Section 103 of the MPRSA. These individual Section 103 permits (which could be multiple-year authorizations up to 7 years) will be issued by the USACE Regulatory Branch after the EPA concurrence. Individual permits generally require public notice and require other federal consultations (e.g., Endangered Species Act, Essential Fish Habitat) and authorizations (e.g., water quality certification) prior to issuance. As mentioned above, over the last 10 years, only one other entity (Port of Toledo) other than the USACE has disposed at the Yaquina Sites. The volume of material that the Port of Toledo disposed of at the North Site was 1.4% of the total volume of material disposed of at the Sites since 2001.

The USACE's authorized federal navigation project extends from the entrance of Yaquina up to RM 14.0 in Toledo. The project includes the turning basin in Depot Slough at Toledo and the South Beach marina access channel.

Site Management

Goal and Objectives

The primary goal of this SMMP is to assure that disposal activities will not unreasonably degrade or endanger human health, welfare, the marine environment, or economic potentialities (MPRSA Section 103(a)). This goal, and the subsequent objectives, applies generally to all of the EPA's Oregon Coast ODMD sites:

1. Avoid the creation of persistent mounds that can negatively impact the wave climate;
2. Minimize impacts on coastal sediment circulation by keeping sediment in the littoral zone to the extent practicable;
3. Minimize long-term adverse effects to coastal and marine resources[2];
4. Minimize interference with other uses of the ocean;
5. Promote safe and efficient dredge operations;
6. Document disposal and monitoring activities at the disposal sites.

The EPA is meeting all of these goals at the Yaquina Sites, to the maximum extent practicable. For objective #2, the EPA is not able to keep the material in the littoral cell because Yaquina Reef runs

[2] EPA and USACE statutory authority, regulations and guidance define this goal as the need to rigorously assess the material and location for disposal and to test when needed, and adjust where necessary how materials are to be disposed. Testing and adjustments under applicable guidance generally leads to a change in management strategies for the material rather than leading to a decision not to dump the material. Implicit in the guidance and in the application of the regulatory criteria is that a level of adverse effect is to be expected but that those effects are to be limited so as to avoid reaching a level of effect too severe to be endured. In essence 'effects that are too severe to be endured' are to be avoided. Consequently, some level of adversity is anticipated and the term implicitly recognizes that an exercise of professional judgment when looking at the severity of effects is called for. Furthermore, Congress directly authorized EPA to look at the severity of effects in light of the need to refrain from impairing foreign and domestic commerce. It must also be recognized that the term does not mean 'no adverse effects.' With respect to disposal of materials in the ocean, those effects that do not satisfy the applicable prohibitions, limits, and conditions of the regulations for disposal of material in the ocean are to be avoided.

parallel along the shoreline. The presence of Yaquina Reef close to shore at shallow depths prevents nearshore ODMDS designation and dredged material disposal in dispersive locations at depths of less than 60 feet. Thus, the EPA recognizes that for the Yaquina North and South Sites, the material will not be kept within the Newport littoral cell.

To achieve the aforementioned objectives, the EPA and the USACE will do the following:

1. Avoid the creation of persistent mounds:
   - Conduct annual bathymetric surveys.
   - Dump plans will be developed for each Site where disposal will occur. Dump plans establish cells within the Site to ensure uniform placement, minimize the accumulation of material, maximize dispersal out of the site, and avoid excessive or persistent mounding. Dump plans may be adjusted during each disposal season to utilize different portions or cells in the Site(s) as needed.

   - Disposal may be alternated as necessary between the two Sites to allow for maximum dispersal and minimal impact. The North Site is anticipated to receive more frequent use but this may change as conditions warrant.
2. Minimize long-term adverse effects to coastal and marine resources:
   - Place material in a uniform manner. For the Yaquina Sites, the EPA and the USACE will implement a uniform placement strategy. At the Yaquina Bay Sites uniform placement means the spreading of disposal material throughout the Sites, rather than spot dumping. Uniform placement at the Sites is expected to result in a relatively uniform accumulation on the bottom. Application of "uniform placement" is an expected outcome over the long-term and multiple-year disposals, rather than a placement regime to be achieved during each dredging season.
   - A hopper dredge would be used for the majority of dredged material disposal. Hopper dredges will be moving during disposal, spreading material across disposal cells as much as possible, resulting in uniform placement of material and thinner disposal layers than point dumping (modeling estimates were from 2 to 7 cm thickness, based on grain size, depth of fall after release, ambient current strength, and other factors) (Appendix B, pages B-35 to B-45).
   - The majority of the material will be of similar grain size to that at the disposal site such that any changes to the composition of the benthic infaunal and epifaunal communities are minimized.
   - Conduct benthic monitoring (grabs for infaunal invertebrates, benthic trawls) every 5 years within and outside the disposal sites, as EPA resources allow. Monitoring will be conducted such that statistical analyses of community structure indices at disposal and non-disposal areas can be compared.[3] Benthic trawls will be conducted within and outside the disposal sites to qualitatively compare absence/presence and abundance of species. Results will be reviewed by the EPA, in coordination with State and Federal marine resource agencies. The EPA will then determine the significance of these ecological results and any needed

[3] The USACE collected 5 samples from each station in their 1999, 2000, and 2002 benthic grab survey and used the data to calculate the number of species, frequency of occurrence, and community structure indices (Shannon-Weiner Diversity Index; Simpson Diversity Value, evenness, and species richness) at each station. EPA would use this approach or similar for future benthic grab sampling.

subsequent actions.

- At present, the North Site will continue to be the preferred placement area. During some periods, disposal may be alternated between the two sites as necessary to allow for safe and maximum usage of the Sites. Before sites reach the 14-foot mound increase threshold (over the 2001 baseline), re-evaluation of disposal impacts on the wave climate will be initiated. The use of the South Site is more dependent upon wind and wave conditions, particularly in April and May.

3. Minimize interference with other uses of the ocean:
   - For example, a potential use conflict could be with Dungeness crab fishing. This user conflict will be minimized by the USACE notifying the Dungeness Crab Commission when disposal will occur. It is then the responsibility of the point of contact at the commission to notify the crabbers so that pots are not placed during disposal.
   - For other users receiving an individual permit from the USACE Regulatory Division the Dungeness Crab Commission will be notified in the following manner: 1) the USACE will send a courtesy copy of the permit to the Oregon Dungeness Crab Commission; and 2) the permittee will notify the Oregon Dungeness Crab Commission at least 14 days prior to disposal.

4. Promote safe and efficient dredge operations.

5. Document disposal and monitoring activities at the North and South ODMDS:
   - For permits issued under section 103 of the MPRSA by the USACE and concurred upon by the EPA, the applicant/permittee will provide the EPA and the USACE the beginning and ending points of each disposal, volume disposed, and dates of disposal within 60 days of completing disposal in each calendar year that disposal occurs.
   - The USACE will prepare an annual ODMDS summary report documenting surveys (physical or biological), sediment testing (physical and chemical) if conducted, disposal volumes, and beginning and ending dates of each period of disposal during the dredging season, for the prior disposal season (defined as April through October). The USACE will provide this document to the EPA prior to the following dredging season in the annual summary report (described under section “Special Management Considerations or Practices”); the EPA may review and provide comments to the USACE on the document before the USACE finalizes the document.
   - Every 5 years the USACE will provide the EPA with a map of the dump track lines for the prior disposal year (April through October).

These specific Site objectives will be periodically reassessed and/or revised as needed.

Monitoring

Section 102(c)(3)(B) of the MPRSA requires that the SMMP include a program for monitoring the Sites. The main purpose of a disposal site monitoring program is to determine whether dredged material site management practices, including disposal operations, at the site need to be changed to avoid unreasonable degradation or endangerment of human health or welfare or the marine environment (EPA/USACE 1996). To achieve this, the EPA and the USACE will conduct routine monitoring and

special studies, as warranted, and review that information within an adaptive management context.[4]

The following specific monitoring objectives are identified to support the SMMP goal and objectives listed previously for the Yaquina Bay North and South Sites:

1) Ensure that dredged material is being placed as required by this SMMP and the provisions as codified in the Federal Register for the Sites;
2) Ensure that the dredged material is behaving as predicted during placement:
    a) Dredge material does not create persistent and adverse wave-generating mounds
    b) Dredge material remains on-site
3) Unreasonable degradation of the marine environment is not occurring;

Routine Monitoring

The EPA, in collaboration with the USACE will conduct routine monitoring of the physical, chemical, and biological conditions to address the monitoring objectives above. The monitoring frequency for these parameters will be at regular intervals but different frequencies.

- Physical Monitoring. Bathymetric surveys will be conducted by the USACE annually, usually in the spring. The number and length of transects required for annual assessment will be sufficient to encompass the disposal area. The survey area will extend at least one survey transect beyond the disposal area.

  The survey results will be compared to the initial bathymetric baseline survey (February 12, 2001), designation baseline survey (Spring 2012), and the previous year's survey to evaluate cumulative changes between years. This information will assist in determining the site utilization plan for the upcoming dredging season.

  The survey results will be used to monitor the disposal mound and assist in verification of material placement, to monitor bathymetric changes and trends, to ensure disposed dredged material stays onsite, and ensure that the Site capacity is not exceeded. In addition, other historical surveys from the area will be retained and used as needed to determine trends and gather information relevant to site management. More intensive monitoring will be employed when annual bathymetry or direct field observation reveals persistent mounding, or a rapid increase from the previous year. If this information is collected, it will be provided to the EPA in the annual summary reports. The results of bathymetric surveys will be available to the public either on the EPA and/or USACE website, or through individual request.

  Disposed dredged material is expected to move offsite gradually over time during extreme storm events. If bathymetry indicates potential for movement of dredged material beyond the disposal site boundaries in an onshore direction, the EPA and the USACE would review those findings to determine the significance of the movement of sediment and if needed, may use sediment profile (SPI) imaging, video camera monitoring, a Remotely Operated Vehicle (ROV) or other appropriate technology as warranted.

[4] Adaptive management is defined as: A systematic approach for improving resource management, environmental governance, and decision-making by learning from actual management outcomes. Based on the objective measurements of such outcomes and in light of new scientific information, management should change, or adapt its program to better achieve the outcomes desired to better create and maintain sustainable marine ecosystems. [Taken from DOI, Technical Guide: What is Adaptive Management? http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide/Chapter1.pdf.]

- Chemical Monitoring. Chemical testing of dredged material intended to be disposed of at the Yaquina Sites will occur prior to disposal. For the USACE's federal navigation project, the agency characterizes the physical and chemical properties of the material according to the Sediment Evaluation Framework (2009) guidance for dredging projects in the Pacific Northwest. Currently, the USACE characterizes dredged material from their federal navigation project every 5 years. All other users seeking to dispose at either the North or South sites must conduct chemical testing of proposed dredged material per the requirements of the SEF 2009 prior to being approved for disposal.
- Ecological Monitoring. Monitoring of the benthic infauna and epifauna will occur every 5 years from the approval or review of an SMMP, as the EPA resources allow. Information collected from these studies could be incorporated into the revised SMMP. Such monitoring would include surveys (benthic grabs and trawl surveys) within and outside the disposal areas. Monitoring will be conducted such that statistical analyses of diversity indices can be compared. The EPA will determine specific sampling methodology including seasonality, frequency, and sampling stations, subsequent to the approval of this SMMP and in coordination with the USACE and other federal and state agencies responsible for marine resources. It is anticipated that ecological monitoring will be documented as stand-alone reports to be used in adaptively managing the Yaquina Sites. The EPA will make the final determination of what monitoring activities are appropriate.

Special Studies

Special studies are non-routine studies of specified duration that are intended to address specific questions or issues that are not covered by routine monitoring events but may arise from routine monitoring. If such studies are justified, as determined by the EPA in collaboration with the USACE, then the EPA would work with the appropriate entity or agency to design and implement the needed study. The EPA has final authority in determining the need, scope, and scale of the special studies.

A special study may be warranted if through either routine monitoring or outside academic or other credible research, site specific data emerges that a group of species, a single species, or species life stage found in the vicinity of the disposal sites and not analyzed and discussed in the EA, may be at risk of significant adverse affects from disposal. Another example of when a special study would be needed is if an accident or spill occurred that impacted the Sites. Under this example, the EPA would work with the party responsible for such an accident to determine the appropriate studies needed to address the effect of the incident on the Sites and whether specific contingency or possible enforcement action would be necessary. The results of any special studies would be used to refine future management objectives and practices, modify routine monitoring requirements, or reset baseline conditions. Depending on study objectives, technical assistance or advice would be sought from other agencies and entities.

Adaptive Management

The EPA, in collaboration with the USACE, may confer and discuss with other federal and State agencies, as necessary, and will determine which of the following outcomes from the physical, chemical, and ecological monitoring from routine monitoring or special studies is appropriate, and if needed, how the changes or activities will be undertaken and by whom. The EPA will make the final determination of what monitoring activities are appropriate.

No Change:

a. No Change *Required* (e.g., routine monitoring reveals no cause for concern; disposal and monitoring continue as planned).
b. No Change *Possible* (e.g., one-time event or accident took place at a Site - while there may be no change in disposal operations, other actions may be appropriate).

Additional Information Required:

Adjust routine monitoring (e.g., go to more frequent bathymetric surveys; conduct physical, chemical or biological monitoring).

a. Require a special study.

Operational Change Required:

a. Scheduling (e.g., adjust time periods or rates of disposal).
b. Adjust placement of material within a Site (e.g., place material in a different manner).
c. Restrict type or quantity of material placed at a Site.

Change Sites:

Relocate disposal activities from one Site to another (i.e., days to weeks); follow-up with monitoring to determine if additional attention is warranted.

Discontinue Disposal Site Use:

a. Cease Disposal – short-term (e.g., 1 season). A known temporary condition took place which merits discontinued use for a short period of time; follow-up with monitoring to determine if additional attention is warranted.
   Cease Disposal – long-term. Typically, this would occur when routine monitoring or a special study confirms an unacceptable condition persists. This would require Site modification or identification and designation of a new site(s).

The aforementioned actions will be applied to the results of the physical, chemical, and ecological monitoring to avoid unreasonable degradation or endangerment to human health or welfare, or the marine environment. The EPA will use the following as a guide for further action:

- If physical seafloor monitoring shows seafloor elevations at 14-feet above the 2001 baseline elevations over more than 30% of the Site, the USACE will re-evaluate disposal impacts on the wave climate. If mounds above this threshold become widespread or persistent, the USACE and the EPA will conduct additional site assessment to determine if further site restrictions or change in disposal methodology are needed.
- If routine bathymetric monitoring shows movement of significant volumes of dredged material off the sites in an onshore direction, the Corps and the EPA will conduct additional monitoring to determine the extent of movement and the potential effect on bottom habitat in the vicinity of the reef, and if appropriate, determine if special studies are needed.

- For chemical monitoring of the dredged material prior to disposal, if screening levels (as defined in the 2009 SEF) are exceeded, additional biological testing would be required. A determination as to the suitability of that material for disposal at the North or South Site is made by the interagency Portland Sediment Evaluation Team with a final decision made by the EPA.

- For ecological monitoring, unreasonable degradation of the marine environmental could be triggered by, increasing the volume of disposal material, changing the disposal operation to something other than uniform placement, or increasing the days of the disposal.

Site management and monitoring will be adjusted at any time as conditions warrant. If the EPA has reason to believe that human health and safety may be adversely impacted by Site use and/or that the marine environment at the Sites may be at an increased risk of degradation or other adverse impact, additional testing or monitoring may be required and Site use may be restricted or terminated while Site assessment is underway. The USACE and the EPA may discuss Site monitoring with other federal and state agencies to receive their feedback.

Special Management Conditions or Practices

Section 102 (c)(3)(C) of the MPRSA requires that the SMMP include special management conditions or practices to be implemented at each site that are necessary for the protection of the environment. The following special management conditions or practices will be implemented at the Yaquina Bay North and South Sites.

1) *Placement Strategy.* The placement strategy has a large influence on the consequences of disposal in any site. Placement strategies vary, ranging from individual dumps to the long-term distribution of material. Both the EPA and USACE policy establishes a preference for beneficial use of dredged material when practical. For the reasons discussed earlier, this is not possible at the Yaquina Sites.

   For the Yaquina Sites, the EPA and the USACE will implement a uniform placement strategy. At the Yaquina Bay Sites uniform placement means the spreading of disposal material throughout the Sites, rather than spot dumping. Uniform placement at the Sites is expected to result in a relatively uniform accumulation on the bottom. Application of "uniform placement" is an expected outcome over the long-term and multiple-year disposals, rather than a placement regime that needs to be achieved during each dredging season.

   Dredged material is to be preferentially placed in the North Site, if capacity is available in that location. Exceptions to this requirement may include: (1) material or equipment incompatibility; (2) weather or navigation safety conflicts (e.g., use of multiple dredges); (3) expected volumes exceed annual capacity in any year; and/or (4) specific restriction or direction by the EPA.

2) *Dump plans*. The USACE will prepare a dump plan for each year, and shall be available upon request by the EPA.

3) *Quantity, Seasonal Weather and Environmental Restrictions.* Quantities placed at the North and South Sites will vary year-to-year depending on shoaling. Disposal volumes and placement will be closely monitored and documented to verify uniform placement and to assess dispersive capability. Adverse sea and weather conditions limit dredging and disposal to a period typically from June 15 through October 31, although the USACE usually dredges the Yaquina Bay project approximately 4 to 6 days in April and May. Even during the dredging season, storm events can restrict disposal events. Environmental restrictions may be imposed on disposal. In the event that new information or monitoring results reveal the need for any additional restrictions, disposal activities may be scheduled so as to avoid unreasonable degradation of the marine environment.

4) *Equipment Considerations.* The type of dredge used influences the dimensions of the individual and cumulative dump mound. Hopper dredges are the dredge-type normally deployed at Yaquina Bay for sandy material. Hopper dredges, such as the USACE' multiple bottom-door hopper dredge Yaquina, produce a thinner deposit than the typical split-hull contract hopper dredges at any given water depth. Material discharged from a split-hull barge is typically more consolidated than material discharged from a hopper dredge. Bottom dump scows and split haul hopper dredges may be used at Yaquina. The current proportion of use between a hopper dredge versus split-hull barge allows a uniform placement strategy to occur.

5) *Equipment Requirements and Discharge Point.* Hopper dredges or clamshell and barge operations could include USACE and private contract dredges and barges. All such operations are required to meet all U.S. Coast Guard requirements for safety. They are also required to use modern global positioning equipment capable of fixing their location within plus or minus 3 feet to ensure that material is placed within the designated disposal sites. As stated in the reporting requirements section, daily records are required of dredgers indicating where material was dredged and where and how material was placed when disposed. For individual permittees, the start and endpoint coordinates for each load disposed at the North or South Sites must be recorded and shall be reported to the EPA within 60 days of completing disposal in each calendar year that disposal occurs. For the USACE federal navigation dredging and disposal, the start and endpoint coordinates for each load disposed at the North or South Sites must be recorded and shall be provided to the EPA when requested.

6) *Debris Removal Provisions.* Debris is material that could cause interference with particular uses of the ocean. Floatable debris might include logs, wood chunks, or plastics that can be navigation hazards, foul beaches, or harm marine life. Non-floatable debris may cause conflicts with bottom-net or trawl fishing and includes materials such as logs, pilings, rip-rap and concrete. As a general rule, non-floatable, non-sediment materials that would pass through a 24-inch x 24-inch mesh is not considered debris if it is natural in origin and only occasionally found within, and therefore dredged as part of, the sediment matrix. This would only be a potential issue for clamshell dredging as hopper and pipeline dredges are incapable of picking up large debris.

   Typically, the planning or permitting process assesses the potential risks of any debris that could be encountered during dredging. Should debris be identified as a potential issue, the USACE or the EPA may make dredging or disposal area inspections to ensure that a contractor is in compliance with the approved operating plans, and that debris is removed prior to discharge at the Sites. The preference is that floatable debris be removed at the dredging area; however, circumstances may occur where it must be picked out of the water at the disposal area. Clamshell-dredged sediments, which contain debris that is not easily removed, may require screening through a 24-inch x 24-inch mesh or grid structure. The mesh must be periodically cleaned and the debris disposed of according to the approved dredging and disposal plan

   Dredging contractors and USACE dredge captains are required to maintain a record of the handling of debris encountered during dredging and disposal. Compliance inspectors may review these records. If debris is encountered, copies of dredging logs recording management of debris shall be provided to the EPA.

7) *Quantity of Material and Presence of Contamination.* Section 102(c)(3)(D) of the MPRSA requires

that management plans include consideration of the quantity of the material to be disposed of at the site, and the presence, nature, and bioavailability of the contaminants in the material.

The EPA anticipates that the average annual volume of material to be disposed of at the Sites will be 310,000 cy, with a maximum annual volume of 495,000 cy. Only clean dredged material can be placed into the Sites per current statutes and regulations (SEF 2009). Material suitability must be documented prior to disposal at the Sites. This must be completed as part of regulatory permitting (non-USACE) or the USACE substantive review process for specific dredging projects where disposal at the Yaquina sites is proposed. The EPA will evaluate all sediments to be placed at the Yaquina Bay North and South Sites according to applicable current requirements of the MPRSA, the national testing manual, *Evaluation of Dredged Material Proposed for Ocean Disposal* (USACE/EPA 1991) and the regional *Sediment Evaluation Framework for the Pacific Northwest* (SEF 2009) or their subsequent replacements.

Sediment characterization results of dredged material approved to be disposed at the Yaquina Bay Sites shall typically be retained by the USACE—either as the entity responsible for the dredging and disposal [Planning and/or Operations and Maintenance (O&M) program] or the permitting agency (regulatory permits). Ultimately, all sediment data will be routinely entered into a publicly available sediment database. The EPA will retain secondary copies of sediment characterizations.

8) *Annual Site Review.* The EPA and the USACE will meet annually to discuss the prior calendar year's use of the Yaquina Bay Sites. Prior to the meeting, the USACE will prepare a summary report for the prior dredging/disposal year. The summary report will include: results of sediment characterization (if conducted) and testing recency of material proposed for discharge, the pre-dredging/disposal hydrographic surveys (typically conducted the previous spring), and dredge operating parameters. In addition, the site review meeting will include discussion on any operational adjustments that should be implemented in the upcoming dredging/disposal year, identify Site capacities, expected volumes to be disposed, sediment characterizations if applicable, testing recency of material proposed for discharge, dredging and disposal techniques, timing and locations, routine monitoring (e.g. annual bathymetry and comparisons to previous bathymetry) and/or special studies, and other considerations drawing on the then-current Site use conditions and SMMP.

   The USACE, as prime user of the Sites and as permitting authority, will prepare the summary report and provide it to the EPA each spring. Once reviewed by the EPA, with an opportunity for the EPA's recommendations/suggested changes to be incorporated, and with an opportunity for the USACE and the EPA to discuss any more-recent site-specific information, the summary will constitute the template for that year's disposal. The EPA recognizes that the summary cannot anticipate every operational situation. Day-to-day flexibility in dredging and disposal decisions will be necessary; however, the user will make every effort to consult and coordinate with the EPA and will seek the EPA's concurrence before changes are initiated. Such changes could include decisions to increase the spacing between dumping positions, to shift disposal operations to other portions of the Sites, or to redistribute placement of material between the Sites.

9) *Record-keeping and reporting.* The EPA must review and concur on USACE-issued dredged material ocean disposal permits, and for USACE dredged material ocean disposal (33 CFR Part 336.2(d) [2]-[5]). The EPA's concurrence for either of these activities may result in additional conditions that affect record-keeping and reporting requirements (as deemed necessary to support

Site management). Permittees/applicants are required to keep daily records of disposal activities indicating where material was dredged and where and how material was disposed at the Site(s); the start and endpoint coordinates must be recorded for each load placed.

The summary report from the USACE to the EPA for their federal navigation disposal events at the North and South Sites must include the following: physical surveys conducted the prior year, sediment characterization results (physical and chemical) if completed, disposal volumes and beginning and ending dates for each disposal for the previous disposal year (April through October.). The USACE will provide this document to the EPA prior to the following dredging season; the EPA will review and provide comments to the USACE on the document before the USACE finalizes the document. When needed for adaptive management, the USACE and/or the EPA may also request placement plots showing which portions of each Site were used for disposal that dredging year.

The annual site review report and data reports from routine monitoring or special studies must be compiled and submitted to the EPA (ATTN: Region 10, Pacific Northwest Ocean Dumping Coordinator). These results will be evaluated by the EPA and USACE, and these agencies will attempt to make consensus decisions concerning the need for management changes regarding the Sites. While a consensus process is the goal, the EPA has final authority over Site management decisions. Finally, the EPA should receive notification when in-water work is to begin. In spring of any given year, the EPA should receive an annual dredging schedule from the USACE in advance of the dredging season. The EPA should receive updates (via telephone or email) to the schedule as they become available, with the EPA notified by the USACE not less than 15 days prior to the beginning of a dredging cycle or project disposal. Holders of Section 103 permits shall notify the EPA not less than 20 days prior to use of the Sites in a given dredging year.

10) *Inspection and surveillance provisions.* The EPA will typically utilize the inspection and surveillance capabilities of the USACE and the U.S. Coast Guard (USCG). For example, contract dredges are periodically inspected by USACE personnel to ensure dredging and disposal takes place in the correct locations, and USACE dredges are responsible for ensuring their own proper positioning. The EPA may also choose to implement its own inspection and surveillance requirements using the EPA personnel or contractors. It is expected that the EPA and the USACE will coordinate with each other on any special inspections and surveillance.

11) The EPA may condition, terminate or restrict site use with cause.

SMMP Review and Revision

Section 102(c)(3)(F) of the MPRSA requires that SMMPs include a schedule for plan review and revision. At a minimum, the EPA will conduct a substantive review of the SMMP no less frequently than every 10 years once it has been finalized. The EPA will consider the results of the monitoring or special studies during this review, or at intervening times if it is warranted, and update the SMMP as necessary to avoid unreasonable degradation or endangerment of human health or welfare or the marine environment. The EPA will conduct these reviews with the USACE and other federal and state marine resource agencies, technical experts, and stakeholders.

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