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STAFF RECOMMENDATION

ON CONSISTENCY DETERMINATION

Consistency Determination No.	**CD-017-06**
Staff:	Cassidy Teufel-SF
File Date:	2/28/2006
60th Day:	4/29/2006
75th Day:	5/14/2006
Extension Granted:	Indefinite
Commission Meeting:	12/14/2007

FEDERAL AGENCY: **U.S. Army Corps of Engineers**

DEVELOPMENT LOCATION: Humboldt Bay Navigation Channels and offshore Humboldt Open Ocean Disposal Site, Humboldt County (Exhibits 1 and 2).

DEVELOPMENT DESCRIPTION: Four year maintenance dredging program (2008-2011), consisting of spring (1,400,000-2,900,000 cubic yards per year) and optional fall dredging of the Humboldt Bay Bar and Entrance Channels with disposal at the Humboldt Open Ocean Disposal Site.

SUBSTANTIVE FILE DOCUMENTS: See Page 16

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE) has submitted a consistency determination for a four year maintenance dredging program for Humboldt Bay, consisting of annual spring and fall dredging with disposal at the Humboldt Open Ocean Disposal Site (HOODS). The Commission has historically concurred with individual dredge sessions on a project by-project basis but in 1998 concurred with a similar five year maintenance dredging program which concluded in 2003 (CD-045-98). Since 2003, the Commission has concurred with a consistency determination (CD-005-04) for a one-year program of spring and fall maintenance dredging of the same Humboldt Bay navigation channels and has concurred with three negative determinations for annual maintenance dredging of the same channels (ND-029-05, ND-016-06 and ND-007-07). In the interest of efficiency and considering the long history and careful review of previous dredging programs at the Humboldt Bay Bar and Entrance Channels, the USACE has again submitted a multi-year consistency determination to conduct annual maintenance dredging of these channels. The major issues raised by dredging in Humboldt Bay and offshore disposal are impacts to fisheries and marine species, loss of sand to the littoral cell, and navigational concerns.

Due to the offshore location and depth of HOODS, continued use of this disposal area will not cause a navigation hazard or adverse impacts to commercially valuable fishery resources. It could, however, contribute to beach erosion and shoreline retreat through loss of sand from the littoral system. As it has maintained consistently through past reviews of disposal of sand at HOODS, the Commission continues to support the need to monitor the shoreline for erosion along the north and south spits of Humboldt Bay. To address this concern, the USACE has been monitoring the shoreline every two to three years as an integral and mandatory part of all Humboldt navigation channel dredging programs since 1990 (when open ocean disposal at HOODS began) and has committed to reconsidering disposal at HOODS if this monitoring indicated that substantial shoreline erosion was occurring. As part of the proposed four year program, the USACE will continue this monitoring, specifically by making use of aerial survey efforts using a Light Detection and Ranging (LIDAR) system that have been planned and funded for fiscal year 2008 through a different USACE project.

In addition to conducting monitoring, the USACE periodically reviews and analyzes the data that is gathered during aerial monitoring events. Recently conducted comprehensive analyses of the results of the past 17 years of shoreline monitoring data have indicated that erosion and inland movement of the shoreline along the north spit of Humboldt Bay is occurring. To date, however, the amount of perceived erosion has not exceeded the significance criteria adopted at the inception of the monitoring program and a clear link between disposal practices at HOODS and increasing shoreline erosion along the north spit has yet to be demonstrated. Despite the fact that there is not sufficient information from the shoreline monitoring program to suggest that HOODS should be reconsidered as a disposal option, as a precautionary measure, the USACE has been working closely with Commission staff and the EPA to consider and assess the feasibility of alternate disposal practices and sites. Through this multi-agency collaborative process, both short and long-term strategies have been developed. These strategies include the following:

- The USACE will work with Commission staff, the Humboldt Bay Ecosystem Project and the Humboldt Bay Conservation and Recreation District to investigate a nearshore dredged material beneficial reuse demonstration project within the area perceived to be experiencing shoreline erosion. Coordination will include identifying biological and physical process studies required to successfully execute a pilot project, community outreach efforts and environmental documentation. Environmental compliance for the demonstration, including the preparation of an Environmental Assessment, Biological Assessment/Essential Fish Habitat Assessment, Water Quality Certificate and compliance with the Coastal Zone Management Act will be completed and approved prior to the initiation of the demonstration project.

- The proposed dredged material beneficial reuse demonstration project is projected to commence in 2009 and run through 2011. During this period the USACE will annually provide the Commission and other regulatory agencies with dates, times and volume of beneficial reuse placement. In addition, prior to initiation of any dredged material disposal associated with the demonstration project, the USACE will prepare a Coastal Zone Management Act consistency determination and obtain additional Commission concurrence. Following 2011 dredged material placement, the USACE will evaluate the success of the proposed demonstration project and consult with Commission staff regarding the results and future of the demonstration project. The Corps will also prepare a Coastal Zone Management Act consistency determination and obtain additional Commission concurrence prior to initiating dredging activities in 2012.

- The USACE will prepare a Dredged Material Management Plan (DMMP), in collaboration with the newly formed Humboldt Bay Ecosystem Project, the Humboldt Bay Conservation and Recreation District, the Commission and the local community to address sediment management in Humboldt Bay. The purpose of the DMMP would be to identify alternative dredged material placement strategies for the Humboldt County region. The DMMP will be initiated in 2008 and is anticipated to be a 'working document' that will incorporate the results of the dredged material beneficial reuse demonstration project.

- In April 2007, the newly formed Humboldt Bay Ecosystem Project invited staff from the USACE to participate in the group's Advisory Team. The Humboldt Bay Ecosystem Project is composed of members from the state Coastal Conservancy, National Oceanic and Atmospheric Administration – Fisheries, California Sea Grant, other regulatory agencies, the scientific community and stakeholders. The USACE has agreed to participate in this project to rely on expertise and public support for the Demonstration Project and preparation of the DMMP. Additionally, by coordinating with the Humboldt Bay Ecosystem Program, the USACE and the Humboldt Bay Ecosystem Project may be able to obtain funding more efficiently.

As a coordinated, comprehensive and precautionary approach that continues the existing shoreline monitoring program, preserves the option of current and future disposal activities at HOODS and begins the process of considering alternative disposal options within the nearshore littoral system as a means of reducing the potential for shoreline erosion to occur, the proposed four year dredging

program is consistent with the dredging, beach replenishment, navigation, marine resource, and commercial fishing policies (Sections 30220, 30224, 30230, 30231, 30233, 30234, 30234.5) of the Coastal Act.

STAFF SUMMARY AND RECOMMENDATION

I. Project Description. The USACE proposes to conduct a four year maintenance dredging program in Humboldt Bay, from fiscal year 2008 through fiscal year 2011 **(Exhibits 1 and 2)**. The program would continue the USACE's recent practice of spring maintenance dredging of existing navigation channels to their design dredge depths with additional fall dredging occurring in the Bar and Entrance Channel only if adequate depths are not achieved during the spring dredging episode. Spring dredging would remove between one and two million cubic yards of sandy material from the Humboldt Bar and Entrance Channels, and between 400,000 and 900,000 cubic yards of sand, fine and clay materials dredged from the North Bay, Eureka, Samoa, and Fields Landing Channels. Generally, the dredging of these channels lasts for approximately 30 days during the mid-March through mid-May eight-week spring maintenance dredging episode. If necessary, additional fall dredging of the Bar and Entrance Channel would be conducted during the July through September fall dredging timeframe and persist for approximately 30 days or less.

Disposal of spring and fall dredged materials would occur at the Humboldt Open Ocean Disposal Site (HOODS), which is one square mile in size, ranges in depth from 160 to 180 feet, and is located approximately three miles offshore **(Exhibits 1 and 3)**. Material comprised of sand and small to moderate percentages of fine silts and clays (1 to 60 percent) dredged from the Eureka, Samoa, and Field's Landing Channels would be disposed in Quads 1 and 4 (cells B2, C2, D2 and E2). Material comprised of 89 to 98 percent sand from the North Bay, Bar and Entrance Channels would be disposed in Quads 1, 2, 3, and 4 (cells B2, B3, B4, and B5; cells C2, C3 and C5; cells D2, D3, D4, and D5; and cells E2, E3, E4, and E5). The cells located in the outer perimeter of HOODS are off-limits for disposal of dredged-material to provide an adequate buffer for surrounding areas outside of HOODS and cell C4 has not been used since 1999 due to evidence that suggests mounding may be occurring. The USACE hopper dredges *Essayons* and *Yaquina* would perform the dredging.

II. Disposal History. The Commission has reviewed and authorized numerous individual USACE dredging projects at Humboldt Bay since the federal consistency provisions were implemented **(Exhibit 4)**. From the 1940s until the late 1980s, the USACE disposed of Humboldt Bay dredged materials at a site identified as "SF-3," located south of the harbor entrance in about 55 feet of water (**Exhibit 1**). In 1977 EPA granted an interim designation to this site. However, in the 1980s the site began to shoal, creating a navigation hazard to local boaters and fishers. Consequently, SF-3 was "de-designated." (The USACE continued to dispose material at SF-3 for several more years through a project-specific authorization pursuant to Section 103(d) of the Marine Protection, Research and Sanctuaries Act of 1972, however.)

In 1988 the Commission concurred with a consistency determination for the disposal of the fall dredge material at a near-shore site south of the harbor entrance (CD-5-88) (**Exhibit 1**). The

Commission encouraged the use of this site for sandy beach-compatible material, as it retains beach quality material in the littoral cell. In 1989, the Commission concurred with a consistency determination for the disposal of the spring dredge material at SF-3 and for the disposal of the fall dredge material at the near-shore site (CD-26-89). The spring dredge material comes from the inner harbor channels and contains a larger percentage of silts and clays (although the vast majority of the material is still comprised of sand). These fine-grained materials are not suitable for near-shore disposal due to their incompatible grain size when compared to the sandy materials which dominate the near-shore and ocean beach areas along the north and south spits of Humboldt Bay.

For maintenance dredging operations since 1990 (and for one harbor deepening project), in reviewing consistency and negative determinations the Commission and its staff have agreed with the USACE that the Humboldt Open Ocean Disposal Site was the most appropriate and least damaging alternative (ND-16-06, ND-35-05, ND-29-05, CD-05-04, ND-95-00, ND-43-00, CD-45-98, ND-24-98, ND-21-98, ND-128-97, ND-17-97, ND-91-96, ND-61-95, ND-10-95, CD-111-94, CD-64-94, CD-5-94, CD-48-93, CD-1-93, CD-89-92, ND-18-92, CD-29-91, CD-1-91, CD-31-90, and CD-3-90). In 1995 the Commission concurred with EPA's consistency determination for permanent designation of the HOODS site (CD-72-95).

III. Federal Agency's Consistency Determination. The U.S. Army Corps of Engineers has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

IV. Staff Recommendation.

The staff recommends that the Commission adopt the following motion:

MOTION: I move that the Commission **concur** with consistency determination CD-017-06 that the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program (CCMP).

Staff Recommendation:

The staff recommends a **YES** vote on the motion. Passage of this motion will result in a concurrence with the determination and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution to Concur with Consistency Determination:

The Commission hereby **concurs** with the consistency determination by the U.S. Army Corps of Engineers, on the grounds that the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the CCMP.

V. Findings and Declarations:

The Commission finds and declares as follows:

A. Need for Dredging/Navigation. Maintenance dredging of existing navigation channels in Humboldt Bay supports the dredging needs of the Humboldt Bay Harbor and Recreation District, the U.S. Coast Guard, commercial fishing boats, and recreational boats using the Bay. Section 30701 of the Coastal Act notes that, along with the major California Ports, the Harbor District is one of the state's primary economic and coastal resources. The Coastal Act contains strong policy language and legislative direction supporting and encouraging protection of existing shipping and boating uses, including the transportation of oil and gas, timber and timber products, and other commercial and recreational shipping and fishing activities.

Section 30220 provides that:

> *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

Section 30224 provides that:

> *Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.*

Section 30234 provides, in part, that:

> *Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded ….*

Section 30234.5 provides**:**

> *The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.*

Maintenance of navigation channels within Humboldt Bay is necessary to provide safe access to berthing, loading, and repair areas. These channels need regular dredging in order to maintain the depth necessary for ingress and egress into the bay. Without regular dredging, the channels would eventually silt up and interfere with safe access into the bay. The Coastal Act supports the proposed maintenance dredging in Humboldt Bay, because it is necessary to accommodate high priority uses such as those identified in Sections 30220, 30224, 30234, and 30701 of the Coastal Act. Disposal at HOODS would not result in a navigation hazard or adversely affect fishery resources for the reasons discussed below in analyses of alternative disposal sites and marine

resource impacts, and therefore the proposed disposal would also be consistent with these Coastal Act policies.

B. <u>Dredging</u>: Section 30233(a) of the Coastal Act states in part that:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following [, including]: . . .*
>
> > *(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps. ...*

The proposed maintenance dredging program constitutes dredging within wetlands and estuaries, and the proposed disposal constitutes filling within open coastal waters. Section 30233(a) of the Coastal Act sets up a three-part test for such projects: (1) an allowable use test; (2) a mitigation test; and (3) an alternatives test. The first test is met because the project qualifies as an allowable use under Section 30233(a)(2) as "Maintaining existing . . . previously dredged, depths in existing navigational channels…."

In addressing the alternatives test of Section 30233(a), the Commission notes that without maintenance dredging, navigation in Humboldt Bay would become hazardous and eventually impossible due to sedimentation of channels. No other dredging alternatives are feasible or less damaging. The Commission therefore reiterates, as it has found previously, that the proposed maintenance dredging of existing navigation channels to previously dredged depths represents the least damaging feasible dredging alternative.

When the Commission examined disposal site alternatives for previous maintenance dredging projects at Humboldt Bay, it acknowledged that a disposal site needed to be located close enough to the harbor to be economically feasible, needed to reflect the concerns of the local boating and fishing community, and the site needed to minimize unavoidable adverse ecological effects from disposal. As analyzed in previous consistency determinations, the USACE considered several disposal sites: (1) the proposed HOODS area (used in dredging operations since 1990); (2) the nearshore site (used in 1988 and 1989); and (3) SF-3 (used for many years prior to 1988), all of which are shown on **Exhibit 1**. When the Commission concurred with EPA's consistency determination for permanent designation of the HOODS disposal site as the area's dredge disposal site in 1995 (CD-072-95), the Commission compared the three sites as follows:

> *SF-3 was rejected due to the fact that past disposal at that site resulted in mounding and waves breaking, causing a navigational hazard to boaters. The Corps used the near-shore disposal site for disposal of material from ...[several] past dredging sessions. As part of its dredging operations, the Corps of Engineers monitored the near-shore site through pre- and post-disposal bathymetric surveys, release of seabed drifters, and biological sampling.*

> *From the bathymetric surveys, the Corps determined that the near-shore site has shallowed over much of the area by several feet and has not returned to its pre-disposal depths. There were also concerns about effects on juvenile crab habitat, other biological effects, and impacts to navigational safety. Therefore, unless ongoing shoreline erosion monitoring indicates an erosion problem, the Commission considers the near-shore site to be less preferable than the HOODS site.*

In the February 2006 Environmental Assessment completed by the USACE in support of the subject consistency determination, the USACE re-examined several project and disposal alternatives: (1) no action; (2) beach disposal sites near Samoa and near Fairhaven on the north spit; and (3) aquatic sites at SF-3, and the nearshore disposal site off the south spit; and (4) HOODS **(Exhibit 1)**. The no-action alternative is not feasible, the upland sites have sensitive habitat and access concerns, and the two nearshore sites have resulting in shoaling and navigational concerns in the past. A fifth option, the use of a large new nearshore disposal site offshore of the north spit area in which dredge material could be thinly spread, was not contemplated or reviewed in this Environmental Assessment and, as described below, will be assessed by the USACE for possible use in 2009 as part of a nearshore dredge material beneficial re-use demonstration project. In the meantime, the use of HOODS for dredged material disposal minimizes the impacts of disposal on biologically and commercially important fish species in the area. This site has shown lower biotic abundance than other sites in the general area. In addition, the site is at a depth (160 to 180 ft.) which minimizes shoaling problems. Finally, as discussed below concerning disposal site monitoring and in the following section of this report concerning shoreline monitoring, the USACE will continue to monitor the site to assure it remains the least damaging disposal alternative. Therefore, as it has found for dredging activities in Humboldt Bay over the last 17 years, the Commission concludes that with the monitoring program and with no conclusive evidence to date of significant shoreline retreat, the proposed disposal at HOODS represents the least environmentally damaging feasible alternative.

The mitigation test of Section 30233(a) is met because the temporary turbidity impacts from dredging are minor and do not warrant mitigation, and monitoring at the disposal site and shoreline erosion monitoring to date have not conclusively shown that disposal is causing significant adverse impacts. The site designation process included measures to manage and monitor impacts at the disposal site. EPA and the USACE have joint authority for regulating ocean disposal of dredged material and for managing ocean disposal sites. Management of an ocean disposal site includes: (1) regulating the quantities, types of material, times, rates, and methods of disposing dredged material at an ocean disposal site; (2) developing and maintaining an effective monitoring program for the site; (3) recommending changes for site use, disposal amounts, or designation for a limited time based on periodic evaluation of site monitoring results; and (4) enforcing permit conditions. These measures are provided in EPA's Site Management and Monitoring Plan (SMMP) (**Exhibit 5**), which describes the management and monitoring activities, and which will be in effect for the expected period of site use (up to 50 years and/or an expected maximum capacity of 400 million cubic yards). The primary goal of the SMMP is to assure that the continued use of the disposal site will not cause significant adverse impacts on the marine environment.

Therefore, the Commission finds that the project's impacts are either self-mitigating or do not rise to a level that requires mitigation. The Commission concludes that the proposed four-year maintenance dredging program constitutes an allowable use, is the least damaging feasible alternative, and includes adequate monitoring and commitments to avoid or mitigate impacts in the event monitoring documents adverse impacts, and is therefore consistent with Section 30233(a) of the Coastal Act.

C. <u>Sand Supply</u>. Section 30233(b) of the Coastal Act provides:

> *(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*

The Coastal Act encourages placement of sandy dredge spoils in a manner that will ensure their return to the long shore transport system, when possible. One of the concerns of any dredging project and spoils disposal is the loss of sand from the particular littoral cell, and the possible resulting erosion up- or down-coast. Prior to the late 1980s, both spring and fall material was placed at SF-3, which may have been shallow enough to be within the littoral system given the high-energy wave climate off Humboldt Bay. However, as discussed earlier in this report, disposal at SF-3 was discontinued because the material placed at SF-3 was mounding and creating a shoaling problem. Longer period waves were breaking at the mound and adding to the generally difficult navigation in and out of Humboldt Harbor. Such a navigational hazard can be dangerous to boaters and commercial fishers, and may serve to discourage boating in the area. The Commission subsequently supported disposal at a nearshore site in the late 1980s, which was definitely within the littoral system. However, use of this site was subsequently discontinued, this time due to habitat, fisheries, and navigation concerns. Because of the difficulty in finding a feasible and suitable nearshore site, and given the requirement to monitor the stability of the shoreline in this area as an early warning against shoreline erosion, since 1990 the Commission has authorized non-littoral cell disposal for sandy material, as long as it has been accompanied by shoreline monitoring.

This position was due in part to the fact that the Humboldt Bay area has a high sedimentation rate which may lessen the effect of loss of sand from the long shore transport zone. The primary sources of sediment to the project area are the Eel River and the Mad River. These rivers deliver an estimated 27 million tons and 2.75 million tons of sediment to the project area per year, respectively. In addition, the offshore coastal shelf area receives a positive sedimentation rate of 0.78-1.95 inches per year. The proposed project will remove from the littoral system between 1.4 and 2.9 million cubic yards of sandy sediment. While in other areas of California's coast, in particular eroding shorelines in southern California, a removal volume of this magnitude would be significant, on a short-term basis the effects of this loss in the Humboldt Bay area are minimized due to the amount of overall sedimentation.

Long-term effects may or may not be significant, however. The sediment transport system in the project area is not well understood, and opinions vary as to the predominant direction of littoral

drift. In an effort to better understand the littoral cell, the USACE has undertaken a long-term study of shoreline sedimentation and erosion in the project area, and the Commission staff and the USACE have developed a Memorandum of Understanding (MOU) to reflect the goals, objectives and purpose of this long-term monitoring program. The goal of the study is to detect shoreline changes attributable to removal of sand from the littoral system. If this study demonstrates that substantial beach erosion is occurring, the USACE will re-evaluate the location of the disposal site or consider other forms of mitigation. The major components of the ongoing monitoring program are quantitative and qualitative data and analytical reports, ongoing research by academia and the USACE, aerial photographs, and beach profiles. The USACE initially prepared beach profiles and aerial photographs of the Humboldt cell every two years, and now gathers that information every three years.

The USACE further describes the shoreline sedimentation/erosion study and the results gained to date as follows:

> **Humboldt Shoreline Monitoring Program**: *As part of the Consistency Determination issued by the CCC for Section 102 designation of HOODS (CD-72-95), USACE agreed to monitor the Humboldt Shoreline (Humboldt Shoreline Monitoring Program (HSMP)) to monitor the effects (erosion and/or accretion) of removing sandy material from the littoral cell and placing it at HOODS. The HSMP monitoring area is located within the Eureka Cell and extends approximately 7 miles south of the South Jetty and 7 miles north of the North Jetty. Monitoring includes aerial flyover photography of the shoreline and subsequent analysis of the photographs.*
>
> *The USACE began monitoring the Humboldt Shoreline in the fall of 1990 and monitoring efforts continued in the fall of 1992, 1995, 1998, 2001 and the latest monitoring occurred in 2005. Results of the 2005 HSMP indicate that the overall general trend is seaward movement of the beach and accretion of the subaerial beach volume along the South Spit and shoreward movement of the beach and erosion of the upper beach volume on the North Spit. However, there is a high degree of variability of these results along the lengths of both spits (USACE 2007)…*
>
> *The Memorandum of Understanding (MOU) between the CCC and the USACE stated the results of the surveys would be compared against an erosion criterion based on the historic trends analysis (as presented in the Shoreline Mapping, Pacific Coast Near Entrance to Humboldt Bay, California, Moffat & Nichol for USACE, August 1, 1991). If the results of the HSMP show the criterion is exceeded, USACE is to investigate whether or not disposal practices at HOODS is the cause of the excess shoreline recession.*
>
> *As previously discussed, it appears the general trend of the North Spit of Humboldt Shoreline is receding. USACE staff has met with CCC and USEPA staff several times to address the observed patterns (20 December 2006, 5 April 2007, 18 June 2007, 19 July 2007 and 11 September 2007). As a result of these discussions, CCC and USACE staff have concluded that regardless of the cause of any shoreline erosion in the project area, the adoption of precautionary measures may be appropriate to help ensure that disposal*

of dredged materials at HOODS does not contribute to shoreline erosion within the project area. As such, USACE would like to take a proactive stance and develop an alternate dredged material management practice that would increase the likelihood of dredged material remaining within the nearshore littoral cells that occur within the project area. The above-mentioned agencies have therefore agreed on a plan of action that includes the following items:

- *Consistent with the MOU, the USACE will collect shoreline data in FY 2008 capitalizing on LIDAR [Light Detection and Ranging] survey plans funded by others; however, the USACE will not allocate funding to data analysis.*

- *The USACE will work with the CCC, the Humboldt Bay Ecosystem Project and the Humboldt Bay Conservation and Recreation District (Humboldt Bay O&M Dredging Local Sponsor) to investigate a dredged material beneficial reuse demonstration project along the North Spit (see Section 10 for a conceptual model, success criteria and monitoring plan of the proposed demonstration project). Coordination will include identifying biological and physical process studies required to successfully execute a pilot project, community outreach efforts and environmental documentation. Environmental compliance for the demonstration, including the preparation of an Environmental Assessment, Biological Assessment/Essential Fish Habitat Assessment, Water Quality Certificate and compliance with the Coastal Zone Management Act will be completed and approved prior to the initiation of the demonstration project.*

- *The proposed dredged material beneficial reuse demonstration project is projected to commence in FY 2009 and run through FY 2011. Following FY 2011 dredged material placement, USACE will evaluate the success of the proposed demonstration project and consult with the CCC regarding the results and future of the demonstration project. Dredging and beneficial reuse of sandy material would be conducted by the Government-owned Essayons hopper dredge and is anticipated to occur during the April through March or July through September timeframe. The USACE will provide the regulatory agencies with dates, times and volume of beneficial reuse placement annually (for information regarding project monitoring, see Section 10).*

- *The USACE will prepare a Dredged Material Management Plan (DMMP), in collaboration with the newly formed Humboldt Bay Ecosystem Project (see description of this project below), the Local Sponsor, the CCC and the local community to address sediment management in Humboldt Bay. The purpose of the DMMP would be to identify alternative dredged material placement strategies for the Humboldt County region. The DMMP will be initiated in FY 2008 and is anticipated to be a 'working document' that will incorporate the results of the dredged material beneficial reuse demonstration project.*

- *In April 2007, the newly formed Humboldt Bay Ecosystem Project invited staff from USACE to participate in the group's Advisory Team (see Appendix B). The Humboldt Bay Ecosystem Project is composed of members from the state Coastal Conservancy, National Oceanic and Atmospheric Administration – Fisheries, California Sea Grant, other regulatory agencies, the scientific community and stakeholders. The USACE has agreed to participate in this project to utilize expertise and public support for the Demonstration Project and preparation of the DMMP. Additionally, by coordinating with the Humboldt Bay Ecosystem Program, the USACE and the Humboldt Bay Ecosystem Project may be able to utilize funding more efficiently.*

As stated above, the USACE remains committed to continuing the aforementioned monitoring program, which the Commission has considered to be a crucial protective and early warning measure if there is to be long-term disposal of dredged material outside the littoral cell (i.e. at HOODS). While the continued disposal at HOODS will avoid effects on navigation or fishery resources, it does have the potential to contribute to beach erosion and shoreline retreat through loss of sand from the littoral system. Because of the historic problems associated with SF-3 and nearshore disposal at the site that was used during the late 1980s, for the last 17 years the Commission has authorized USACE disposal of sandy material at HOODS, as long as it is accompanied by shoreline monitoring and a commitment to reconsider disposal options in the event the monitoring shows erosion is occurring.

Although monitoring results to date have not conclusively established that significant shoreline erosion (that is to say, erosion beyond the criterion established and agreed upon by Commission staff and the USACE) is occurring as a result of dredge material disposal at HOODS, recently conducted comprehensive analyses of the results of the past 17 years of shoreline monitoring data have indicated that erosion and inland movement of the shoreline along the north spit of Humboldt Bay is nonetheless occurring to some degree. While the level of this recorded erosion has not been demonstrated to be sufficient to trigger a re-consideration of the use of HOODS as a dredge material disposal site, in recognition of the pattern of shoreline erosion demonstrated by the shoreline monitoring program and as a precautionary measure, the USACE has been working closely with Commission staff and the EPA to consider and assess the feasibility of alternate disposal practices and sites. The results of this process are detailed above and a preliminary description of the nearshore dredge material beneficial reuse demonstration project is detailed in **Exhibit 6**. Although further Commission approval would be required prior to the use of a dredge material disposal site other than HOODS, the process outlined above and initiated as a part of the proposed four year Humboldt disposal program would provide an important first step towards the development of a long-term, collaborative, multi-agency solution to dredge material disposal in Humboldt that is both flexible, precautionary and protective of resources. With the commitments outlined above that the USACE has included in the proposed project, including the commitment to continue the shoreline monitoring program and initiate the process of investigating future disposal sites and options, the Commission concludes that disposal of sandy material at HOODS is consistent with the sand supply policy Section (30233(b)) of the Coastal Act.

D. Marine Resources and Fisheries. Section 30230 of the Coastal Act states:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored ...*

Section 30234 provides, in part, that:

> *Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded ....*

Section 30234.5 provides**:**

> *The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.*

These sections mandate the protection of marine resources. Humboldt Bay provides habitat for many species of fish, including finfish, shellfish, clam beds, and oysters. Seven of the state's 12 shellfish reserves are located in the Humboldt area, and of special importance to the offshore area is the Dungeness crab resource. Humboldt Bay and offshore waters also support a large recreational fishing business. Two federally-listed endangered species are known to occur in the project area: the California Brown Pelican (*Pelecanus occidentalis*) and the short-tailed albatross (*Diomedea albatrus*). The federally-listed threatened western snowy plover (*Charadrius alexandrinus*) nests on the south spit of the harbor and the threatened marbled murrelet (*Brachyramphus marmoratus*) may also occur in the project area. Various waterfowl, shorebirds, and marine mammals are also found in Humboldt Bay and offshore waters.

Recognizing the importance of marine resources to the Humboldt area, the USACE entered into a contract with Humboldt State University to study the marine environment around Humboldt Bay. The study included the collection and analysis of ocean sediments, benthic infauna, demersal fish and macroinvertebrates from the nearshore site and HOODS. Samples were taken in August 1989 and March 1990. The March 1990 survey identified 190 species of benthic infauna. In addition to the survey, the USACE drew on other research to summarize the habitats and critical stages of commercially important fish and invertebrates for Humboldt County, including Dungeness crab.

However, the impact on these species from maintenance dredging should be minimal; further, no time of year is not sensitive for several of these species, and no dredging at all would cause greater damage to the commercial fishing industry. The Commission has also previously found that adult crabs should be able to unbury themselves if thin layers of sand were placed on them, and that maintenance dredging is unlikely to affect waterfowl, shorebirds, or marine mammals, including the threatened/endangered species noted above, as the dredge plant operates in open water and moves slowly. Thus, while the proposed project will have temporary negative impacts on some species, due to turbidity and temporary smothering, it will not adversely affect particularly sensitive or either biologically or commercially important species, and the Commission has historically determined the temporary effects from dredging in Humboldt Bay to be minimal.

Turning to disposal, there are no disposal site alternatives that avoid impacts to benthic infauna, epifauna, or other bottom species. Use of HOODS minimizes impacts on biological resources of the area, as the site contains lower biotic abundance than other sites in the general area. Also, HOODS has naturally varying substrates, including areas of fine sand to sandy silt. Disposing of dredge materials in an area with similar substrate to the dredge material should speed re-colonization of the site. Mobile fish species will re-occupy bottom the area covered with dredged material at HOODS following completion of disposal operations.

As is necessary for all open ocean dredge disposal activities the Commission reviews, the quality of the sediments proposed for open ocean disposal have been evaluated based on the 1991 EPA/Corps testing manual, Evaluation of Dredged Material Proposed for Ocean Disposal -- Testing Manual (i.e., the "Green Book"). As described below, the USACE conducts both sediment testing based on the procedures detailed in the Green Book and pre- and post-dredge hydro surveys of Humboldt Harbor's navigation channels and submits the results of these tests to Commission:

> *Exact dredging dates and the results from annual monitoring of Humboldt Bay related to the maintenance dredging will be reported to the CCC annually, prior to mobilization of the hopper dredges. Annual reporting will include:*
>
> - *Annual Hydro Surveys. The USACE will provide the CCC with pre- and post-dredge surveys of Humboldt Harbor and Bay's Federal navigation channels.*
>
> - *Annual dredged material quantities.*
>
> - *Annual Sediment Testing. In accordance with the Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual (United States Environmental Protection Agency (USEPA) and USACE, 1998), the Master Sampling and Analysis Plan, USACE SF – District Operations and Maintenance Dredging (Master SAP, USACE 2004), and the Humboldt Harbor and Bay's Maintenance Dredging Sampling and Analysis Plan (USACE), the USACE conducts physical, chemical, and biological testing of the dredged materials from Humboldt Bay's navigation channels.*

The USACE conducts Tier II confirmatory sediment testing (physical and chemical) of Humboldt Bay's sediments every five years. Full Tier III ocean testing (physical, chemical, and bioassay) is conducted every ten years. Confirmatory grain size analysis was conducted for material from the Bar and Entrance Channel and Turning Basin, the North Bay Channel and the Samoa Channel in FY 2005; full, Tier III testing was conducted for the Eureka Channel and Field's Landing Channel and Turning Basin in FY 2005. The latest sediment testing, Tier I Sediment Evaluation, was conducted in 2007.

Following the submission of the above-mentioned documents, if no comments are received from the CCC staff within 30 days of receipt, the USACE will proceed with maintenance dredging activities for the respective year.

EPA and the Commission agree that past sediment testing has been adequate to determine the material suitable for ocean disposal, and that the proposed frequency of future testing is adequate to protect marine resources. Thus, the dredging and disposal program will have minimal impacts on water quality and marine resources. Turbidity will increase temporarily, which may affect the ability of phytoplankton to photosynthesize. However, water quality will not be degraded as the sediments have been tested for possible contaminants. Sediment chemistry and toxicity tests from previous spring and fall maintenance dredging and disposal activities within the Humboldt Bay area have demonstrated that the material dredged from these channels is relatively free from organic and heavy metal contamination and is suitable for open ocean disposal. Specifically, concentrations of typical marine sediment contaminants such as tributyltin, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), chlorinated pesticides and dioxins were determined to be absent or well within acceptable limits. Therefore, based on current and historic sediment quality analysis, the Commission finds that the proposed dredging project will not affect water quality or marine resources of the coastal zone.

In conclusion, with the above annual reporting commitment for ongoing coordination for the life of the program, as it has found in reviewing dredging and disposal projects over the previous 17 years at Humboldt Bay, the Commission finds that the proposed dredging and disposal at HOODS represents the least damaging feasible alternative and would avoid significant adverse impacts to marine resources, commercially and recreationally valuable fish resources, and endangered and threatened species. The Commission therefore finds that the project is consistent with Sections 30230, 30231, 30234 and 30234.5 of the Coastal Act.

VII. SUBSTANTIVE FILE DOCUMENTS

1. Previous Corps Consistency and Negative Determinations for Maintenance Dredging in Humboldt Bay: ND-07-07, ND-16-06, ND-35-05, CD-05-04, ND-43-00, CD-45-98, ND-21-98, ND-24-98, ND-128-97, ND-17-97, ND-91-96, ND-61-95, ND-10-95, CD-64-94, CD-5-94, CD-48-93, CD-1-93, CD-89-92, ND-18-92, CD-29-91, CD-1-91, CD-31-90, CD-3-90, CD-26-89, CD-45-88, CD-31-88, CD-5-88, CD-21-87, and CD-18-85.

2. Consistency Determination CD-111-94, USACE Humboldt Harbor Deepening Project.

3. Consistency Determination CD-72-95, Environmental Protection Agency (EPA) designation of offshore (HOODS) disposal site.

4. Environmental Impact Statement for designation of an Ocean Dredged Material Disposal site off Humboldt Bay.

5. Environmental Assessments for Spring 1998 and Fall 1997 Humboldt Bay Dredging, USACE.

6. Dependence of Shoreline Change on Channel Dredge Material Disposal Practices, Humboldt Bay, CA, A Case Study, Madalon and Kendall, 1993.

7. Shoreline Mapping for Humboldt Bay Entrance, Phil Williams & Assoc./USACE, August 1, 1996.

8. Shoreline Mapping, Pacific Coast Near Entrance to Humboldt Bay, California, Moffatt & Nichol for USACE, August 1, 1991.

9. Humboldt Shoreline Monitoring Update, USACE, 1997/1998.

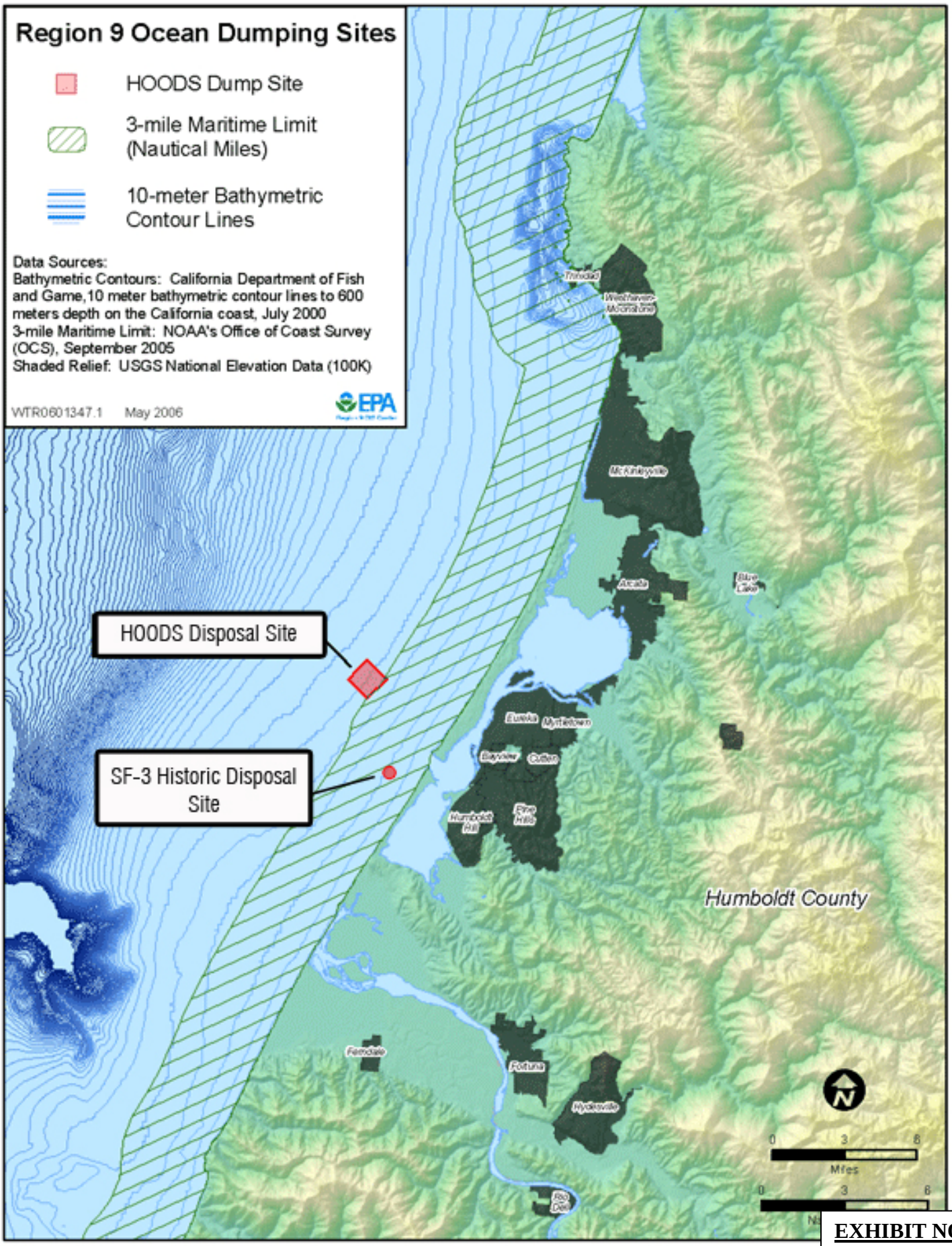
10. Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, Environmental Protection Agency and the USACE, February, 1991.

11. Draft Programmatic 5-Year Environmental Assessment – Humboldt Harbor and Bay Operations and Maintenance Dredging. USACE, February 2006.

12. Coastal Consistency Determination - Humboldt Bay and Harbor Operations and Maintenance Dredging, Humboldt County, California. USACE, November 20, 2007.

13. Report: Chemical, Physical, and Biological Testing of Sediment from the Humboldt Harbor Federal Channel, Eureka, CA. USACE – San Francisco District and Blasland, Bouck & Lee, Inc., March 2005.

14. Addendum Report: Bioaccumulation Tissue Chemistry. USACE – San Francisco District and Blasland, Bouck & Lee, Inc., April 2005.



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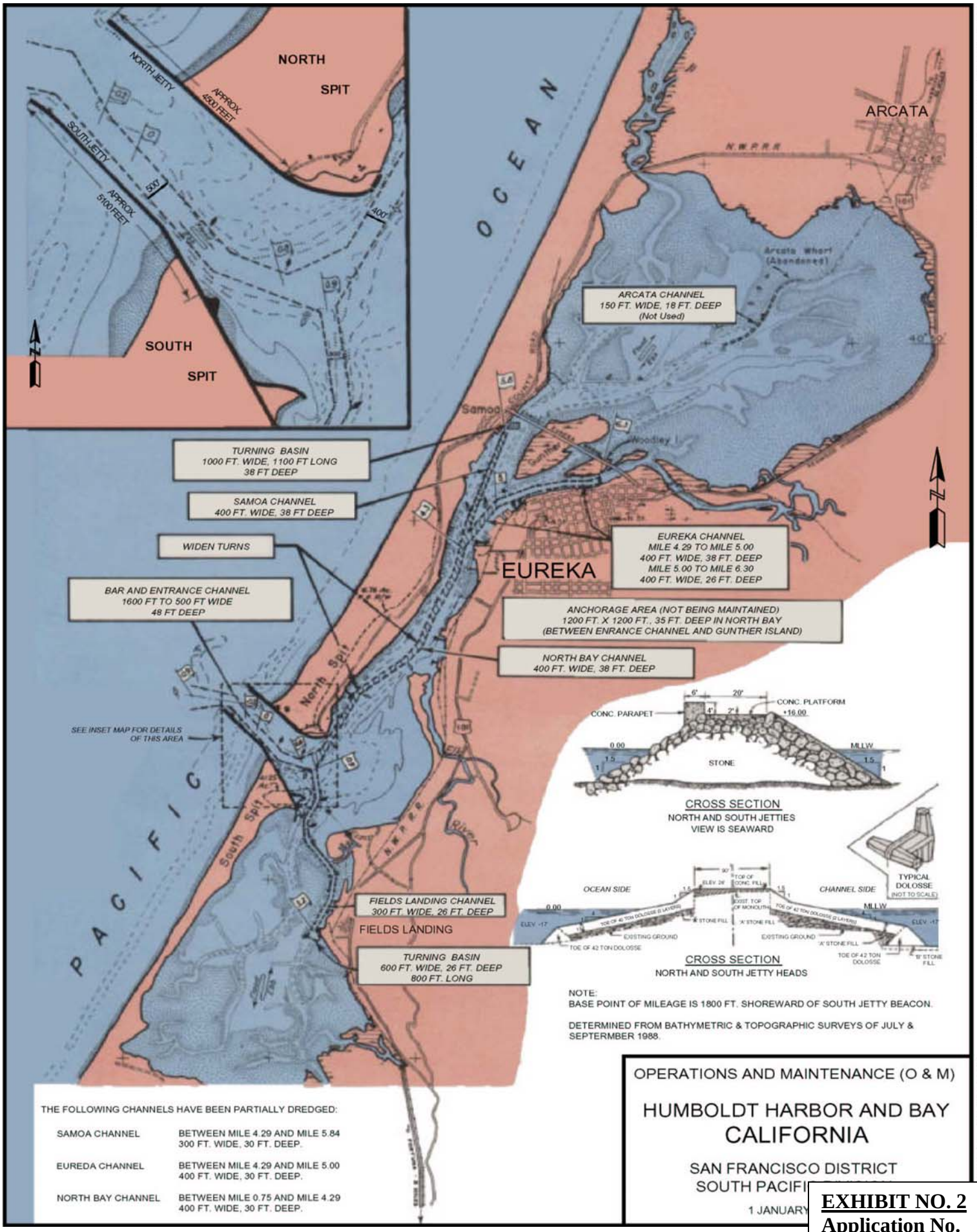

NOTE:
BASE POINT OF MILEAGE IS 1800 FT. SHOREWARD OF SOUTH JETTY BEACON.

DETERMINED FROM BATHYMETRIC & TOPOGRAPHIC SURVEYS OF JULY & SEPTERMBER 1988.

THE FOLLOWING CHANNELS HAVE BEEN PARTIALLY DREDGED:

SAMOA CHANNEL	BETWEEN MILE 4.29 AND MILE 5.84 300 FT. WIDE, 30 FT. DEEP.
EUREDA CHANNEL	BETWEEN MILE 4.29 AND MILE 5.00 400 FT. WIDE, 30 FT. DEEP.
NORTH BAY CHANNEL	BETWEEN MILE 0.75 AND MILE 4.29 400 FT. WIDE, 30 FT. DEEP.

OPERATIONS AND MAINTENANCE (O & M)

HUMBOLDT HARBOR AND BAY CALIFORNIA

SAN FRANCISCO DISTRICT
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Region 9 Ocean Dumping Sites

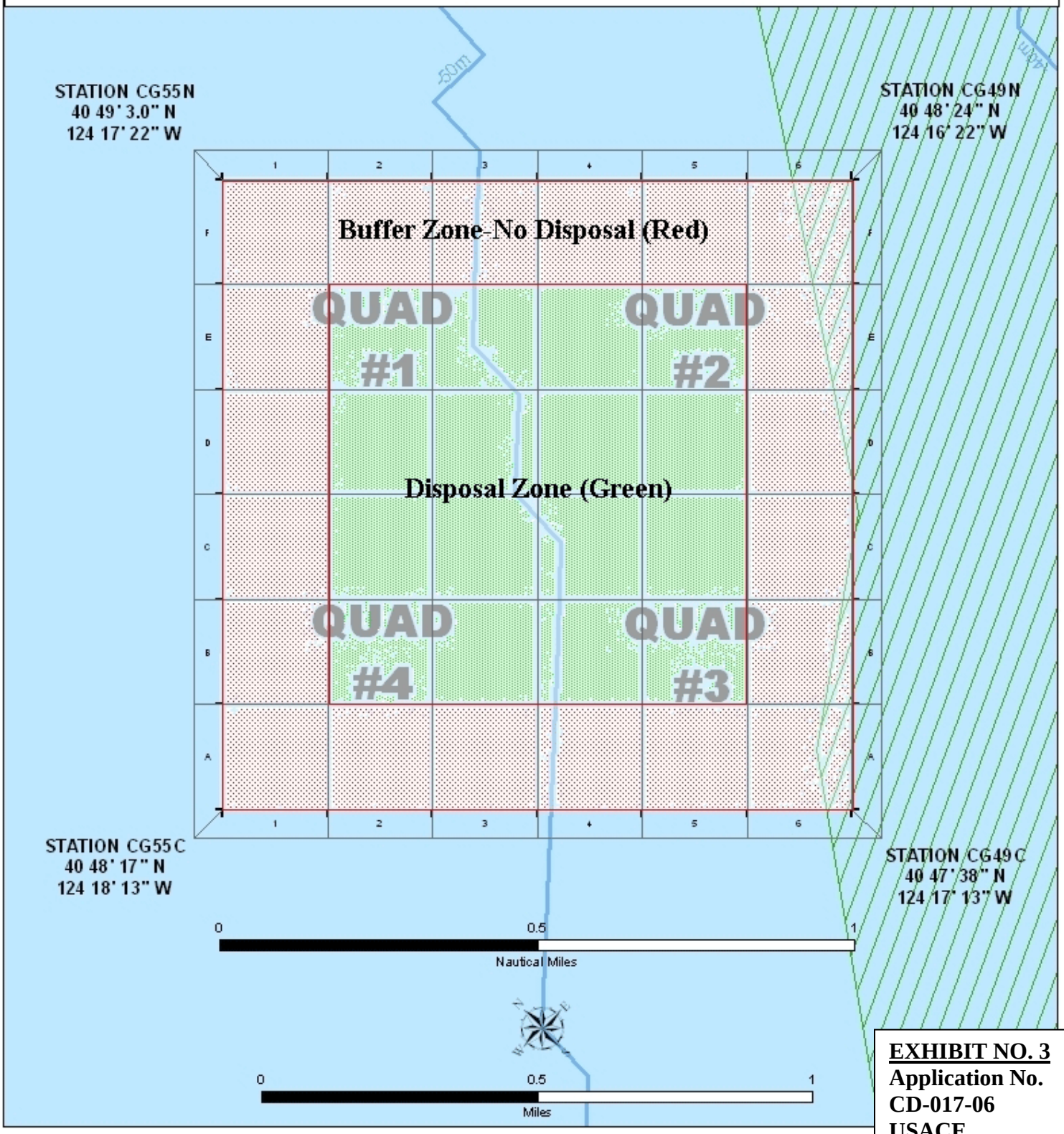
HOODS Dump Site

3-mile Maritime Limit (Nautical Miles)

10-meter Bathymetric Contour Lines

Data Sources:
Bathymetric Contours: California Department of Fish and Game,10 meter bathymetric contour lines to 600 meters depth on the California coast, July 2000
3-mile Maritime Limit: NOAA's Office of Coast Survey (OCS), September 2005

WTR0601347.2 May 2006



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Dredged Material Disposal History at HOODS (1990 – 2005)		
Fiscal Year & Month	**Location of O&M Dredging & Deepening**	**Cubic Yards (cys) Dredged**
Fall 1990 (September)	Bar and Entrance Channels, and North Bay Channels	414,208
Spring 1991 (April)	North Bay, Eureka, Samoa, and Field's Landing Channels	192,224
Fall 1991 (October)	Bar and Entrance Channels, and North Bay Channels	520,000
Spring 1992 (April)	North Bay (Eureka, Samoa, and Field's Landing not dredged) Channel	152,912
Fall 1992 (September)	Entrance Channel only (Emergency Dredging)	145,000
Spring 1993 (Jan.)	North Bay, Eureka, Samoa & Field's Landing Channel	150,395
Spring 1993(Apr/May)	Entrance Channel (Emergency Dredging)	151,000
Fall 1993 (June)	Bar and Entrance Channel, and North Bay Channels	536,350
Spring 1994 (Jan.)	North Bay and Samoa Channels only	90,000
Fall 1994 (June)	Bar and Entrance Channels, and North Bay Channels	509,200
Spring 1995 (March)	North Bay, Eureka, Samoa, and Field's Landing Channels	140,594
Fall 1995 (August)	Bar and Entrance Channels, and North Bay Channel	140,551
Spring 1996 (March)	North Bay, Eureka, Samoa and Field's Landing Channels	159,733
Fall 1996 (August)	Bar and Entrance Channels, and North Bay Channel	474,898
Spring 1997 (February)	North Bay, Eureka, Samoa, and Field's Landing Channels	179,991
Fall 1997 (September)	Bar and Entrance Channels, and North Bay Channel	382,240
Spring 1998 (February)	North Bay Channel	49,156
Spring 1998 (March)	Entrance Channel and North Bay Channel (Emergency Dredging)	211,531
Winter 1999 (January)	Bar and Entrance Channels (Emergency Dredging)	11,039
Spring 1999 (May)	Bar and Entrance Channels (continuation of Emergency Dredging from above) and North Bay Channels	229,003
Spring 1999 (Apr/May)	North Bay, Eureka, Field's Landing Channels, and Bar and Entrance Channels	176,600
Humboldt Deepening Navigation Project	Bar and Entrance Channels, North Bay, Samoa Channels and Samoa Turning Basin	4,339,232
Spring 2000(Apr/May)	Eureka and Field's Landing Channels	24,473
Spring 2000(Apr/May)	Bar and Entrance Channels	296,292
Fall 2000 (Aug/Sept)	Bar and Entrance Channels	589,815
Spring 2001 (March)	North Bay, Eureka, Samoa & Field’s Landing Channels	158,474
Spring 2001 (April)	Bar and Entrance Channel	1,128,681
Spring 2002 (Mar/Apr)	North Bay, Eureka, Samoa & Field’s Landing Channels	197,052
Spring 2002(Apr/May)	Bar and Entrance Channel	1,007,158
Spring 2003 (Mar/Apr)	North Bay, Eureka, Samoa & Field’s Landing Channels	300,000
Spring 2003 (Mar/Apr)	Bar and Entrance Channel	1,505,000
Spring 2004 (Mar/Apr)	North Bay, Eureka, Samoa & Field’s Landing Channels	190,570
Spring 2004 (Mar/Apr)	Bar and Entrance Channel	1,177,706
Spring 2005 (Mar/Apr)	Bar and Entrance Channel	1,148,685
Spring 2005 (Mar/Apr)	North Bay, Eureka, Samoa & Field’s Landing Channels	1,152,860

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EXHIBIT A

HUMBOLDT BAY (HOODS) OCEAN DREDGED MATERIAL DISPOSAL SITE SITE MONITORING PROGRAM

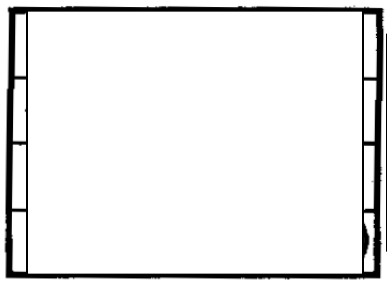
I. INTRODUCTION

Disposal of dredged material is expected to change benthic conditions inside the HOODS boundary because the variation of grain sizes in dredged material disposed at the HOODS is expected to allow different species to colonize the area. Site monitoring activities are necessary to assure that long-term unacceptable adverse environmental impacts do not occur within the HOODS site or beyond the site boundaries. A three-tiered monitoring program has been designed to evaluate conditions at the HOODS. Tier 1 consists of periodic physical surveys of the disposal site to determine the areal extent of disposed dredged material and whether material is being deposited outside of the disposal site boundaries. If significant adverse impacts on selected biological resources are suspected based on the Tier 1 survey, data on physical impacts (Tier 2) and body burdens of chemicals of concern (Tier 3) at the HOODS site and adjacent areas will be compared to a reference site.

The HOODS site monitoring activities are a part of the overall HOODS SMMP. The site monitoring program is based on testing specific hypotheses at three sequential tiers. Several aspects of the site monitoring program were developed in direct response to concerns identified in the HOODS Final Environmental Impact Statement (FEIS). These concerns include questions on the movement of dredged material disposed at the HOODS and possible associated impacts on resident marine resources or fisheries resources if the disposed sediments move outside the site boundaries. Procedures defined in the site monitoring program should provide data required to make management decisions; however, the site monitoring program will be managed with the flexibility to modify, delete or substitute new monitoring procedures as other needs are identified.

II. OBJECTIVES

One of the major objectives of the HOODS site monitoring activities is to detect potentially adverse impacts beyond the HOODS site boundaries. Adjustments in site use will be selected to prevent adverse impacts from occurring in areas adjacent to the HOODS. Scientific analysis of the fate of the disposed dredged material is essential to meet this objective. With regard to physical sedimentation impacts, the objective is to determine whether benthic biological resources of concern have been adversely affected by sediment movement out of the site. The objective of biological monitoring is: (1) to determine if the ODMDS is causing detrimental bioaccumulation in resident infauna, epifauna or fisheries resources, (2) to provide early detection of potential threats to marine community structure, and (3) to evaluate whether potential impacts on biological resources will adversely affect higher trophic levels.



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III. SITE MONITORING OVERVIEW

The site monitoring activities designed for the HOODS involve sequential collection of physical and biological data to help achieve the objectives outlined above. These objectives are defined to ensure compliance with state and federal laws, to provide guidance for EPA Region IX and Corps' San Francisco District staff for site management, and to address the concerns raised by other interested parties. The following concerns are addressed:

A. Sediment Impacts at the HOODS and Outside the Site Boundary

- Adverse physical environmental impacts on benthic communities near the ODMDS boundary.
- Habitat alterations displacing resident benthic communities near the ODMDS.

B. Water Column Impacts Outside the HOODS Site Boundaries

- Potential violation of established criteria at or beyond the site boundary at any time, or violation of criteria within the site boundary 4 hours after disposal.

C. Biological Impacts at the HOODS and Outside the Site Boundary

- Bioaccumulation of contaminants.
- Significant alteration in benthic communities based on bioaccumulation of contaminants.
- Significant changes in the resident epifauna or fish communities.

Each of these concerns is addressed in the site monitoring activities summarized in Table 1. Monitoring in a particular tier is based upon a testable hypothesis. If the null hypothesis for a specific tier is accepted, advancement to the next tier is not necessary. If the null hypothesis is rejected, an appropriate management action can be considered, or the prescribed monitoring from the next tier may be required. Information on management actions is provided in the HOODS SMMP.

Table 1. Tiered Monitoring at the HOODS Ocean Dredged Material Disposal Site

TIER 1

- Periodic bathymetric, side-scan sonar and/or sub-bottom surveys of the HOODS funded by the Corps' San Francisco District based on site use.

TIER 2

- Assessment of sedimentation impacts on biological resources of concern as identified by EPA Region IX and the Corps' San Francisco District. This tier is triggered if dredged material moving out of the disposal site is determined by Tier 1 analysis to be a potential adverse impact to benthic resources.

TIER 3

- Body burden analyses of chemicals of concern in identified biological resources based on EPA Region IX's site designation and management oversight responsibilities. This tier is triggered if dredged material deposited outside of the disposal site is found to contain contaminants which could potentially cause adverse impacts to benthic resources.

CONFIRMATORY MONITORING

- Additional monitoring requirements imposed as needed by EPA Region IX or the Corps' San Francisco District to evaluate sediment dispersion, sediment quality, and extent of benthic impacts.

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Tier 1 bathymetric, side-scan sonar and/or sub-bottom surveys are expected to be scheduled on an annual basis, although this schedule may be modified based on the frequency of disposal, the amount of dredged material disposed at the HOODS, and the results of the monitoring activities. EPA Region IX and the Corps' San Francisco District will evaluate the survey data to test the Tier 1 hypothesis. We will determine whether movement of material out of the HOODS may cause adverse impacts on biological resources of concern adjacent to the site. If management options require additional monitoring, then physical (Tier 2) or biological impact (Tier 3) evaluations will be conducted as needed.

Monitoring actions described in Tiers 2 and 3 involve analyses of data from the HOODS in relation to a reference site described in Section II.A of the SMMP. The characteristics of the reference site or sites will represent the conditions of the HOODS before disposal of dredged material occurred. Thus, meaningful comparisons can be made between the sites to determine the impacts of dredged material disposal operations at the HOODS. Future reference site measurements will provide information on natural variability and periods of any unusual conditions in the region.

IV. DETAILS OF TIERED MONITORING

A. Tier 1 - Bathymetric Survey of the Site

Hypothesis: Dredged material accumulation outside of the HOODS boundary averages less than 4 inches (10 centimeters) relative to the bottom sediment surface defined at the time of site designation.

Monitoring at Tier 1 is designed to determine whether significant amounts of dredged material move beyond the HOODS boundary, thus providing an indication of potentially adverse impacts to nearby benthic resources of concern. Tier 1 monitoring is designed to evaluate the accumulation of dredged material outside of the disposal area, relative to baseline conditions at the time of site designation. Equipment such as precision bathymetry, side-scan sonar, sub-bottom profiling, or other similar oceanographic survey techniques will be used to detect accumulation of dredged material greater than 4 inches (10 centimeters) relative to the bottom sediment surface at the time of site designation. These data will have a resolution of 0.5 inch to test the Tier 1 hypothesis. If Tier 1 analyses show sediment movement outside the site boundary and the null hypothesis is rejected, then management options will be evaluated to mitigate the impacts, or monitoring in Tier 2 can be scheduled.

B. Tier 2 - Sediment Impacts on Biological Resources of Concern

Hypothesis: Dredged material accumulation at or beyond the HOOD does not show significant adverse impacts on biological r concern based on sediment physical properties compared biological communities at a reference site or sites.

Tier 2 monitoring activities are designed to detect significant changes in biological resources of concern as a result of dredged material movement outside the HOODS. Biological resources of concern will be identified by EPA Region IX and the Corps' San Francisco District based on information contained in the HOODS EIS, the survey of the HOODS and information on fisheries resources in the area.

If benthic infauna are identified as a resource of concern, then analysis of this community can be accomplished by examining sediment profiles using techniques including but not limited to sediment profiling camera surveys taken in areas where dredged material has accumulated significantly. This type of information can be compared to other locations within the HOODS, zones outside the HOODS that have not been affected by dredged material disposal, or a reference site(s). The sediment profiling camera method has the advantage of providing in situ estimates of grain size distribution and infaunal community structure (Rhoads and Germano 1982). In addition, depending on the characteristics of previously deposited materials, newly deposited material can be differentiated by the photographs to indicate the rate of deposition at the site boundary for accumulation depths of from 2-8 inches (5-20 centimeters). Publications on this photographic profiling technique indicate that oxidized surface layer of previously deposited dredged material can be identified photographically when covered by similar material for up to a year (Germano and Rhoads 1984).

If resident benthic epifauna (invertebrates or fish) are identified as biological resources of concern, then bottom trawls can be used to sample areas where dredged material has accumulated. Samples can be compared to locations within the HOODS, zones outside the HOODS, or a reference site(s). The Tier 2 sampling is limited to assessment of physical impacts, such as the loss of a biological resource based on sediment movement, grain size changes or other effects from direct contact with disposed dredged material. Disposal of dredged material with a different grain size than the ambient sediments at the disposal site will change the biological community characteristics of the HOODS. Different species may colonize the disposal area because they can live in the finer or coarser grained dredged material. Simple changes in community structure in response to grain size changes are not considered significant impacts at the HOODS. If Tier 2 analyses show significant adverse impacts to biological resources of concern and the null hypothesis is rejected, then management options will be evaluated to mitigate the impacts, or monitoring in Tier 3 can be scheduled.

C. Tier 3 - Analyses of Body Burdens in Biological Resources

Hypothesis: Contaminant body burdens in biological resources of concern at stations where dredged material has moved out of the HOODS and within the HOODS are not significantly greater than body burdens detected in similar biological communities at a reference si

Analysis of contaminant body burdens will be conducted as part of EPA R
site designation and management oversight responsibilities. If chemicals of conc
in EPA Region IX's August 1989 sediment testing guidance) bioaccumulate t

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degree at the HOODS compared to a reference site(s), significant adverse impacts could affect resident biological communities at the HOODS or the adjacent areas where dredged material has moved out of the site. Tier 3 monitoring is designed to determine whether the HOODS is a site of significant bioaccumulation and to provide early detection of the potential for adverse impacts on nearby biological resources or human health.

Tier 3 monitoring will assess the concentration of chemical contaminants in resident infaunal or epifaunal organisms at the HOODS or other areas where dredged material has moved outside the site. The body burdens of organisms collected at or adjacent to the HOODS will be compared to similar organisms at a reference site(s). Collection of resident organisms for this analysis does not need to be quantitative. However, a large enough sample of the target species should be collected to provide adequate tissue for analysis. Sampling devices such as box cores, grabs or benthic sleds may be used. Selection of target species for this portion of the monitoring program should follow the protocols outlined in U.S. Environmental Protection Agency (1987) guidance.

If the Tier 3 hypothesis is rejected, management decisions will be evaluated to mitigate any impacts, or EPA Region IX and the Corps' San Francisco District will consider closing the HOODS and initiating the designation process for another suitable site.

V. REFERENCES

Germano, J. D. and D. C. Rhoads. 1984. REMOTS sediment profiling at the Field Verification Program (FVP) disposal site. Dredging '84: Proceedings of the conference, ASCE, November 14-16, Clearwater, FL, pp. 536-544.

Rhoads, D. C. and J. D. Germano. 1982. Characterization of organism-sediment relations using sediment profiling imaging: an efficient method of Remote Ecological Monitoring of the Seafloor (REMOTS system). Marine Ecology Progress Series, 8:115-128.

U.S. Environmental Protection Agency. 1987. Bioaccumulation monitoring guidance: 1. Selection of target species and review of available bioaccumulation data. EPA 430/9-86-005.

U.S. Environmental Protection Agency, Region IX. 1991. EPA Region IX general requirements for sediment testing of dredged material proposed for ocean dumping, effective date: August 1989, 8 pages.

U.S. Environmental Protection Agency, Region IX. 1995. Final environmental impact statement (FEIS) for the designation of an ocean dredged material disposal site off Humboldt Bay, CA.

NEARSHORE BENEFICIAL REUSE DEMONSTRATION PROJECT

- **Conceptual Model**: The USACE, in consultation with other agencies and stakeholders, will designate a demonstration project area in intermediate water depths offshore of the North Spit. The proposed demonstration area is a rectangle 4,500 yards long, parallel to shore, by 400 yards wide in the cross-shore direction and is shown in Figure 5. The water depth in the demonstration area ranges from approximately 30 to 60 feet MLLW. The hopper dredge *Essayons* will place sediment dredged from the Bar and Entrance Channel within this area by opening their hull for disposal while transiting in a parallel to shore direction. In this manner the expected thickness of sediment deposited on the seabed should range from 0.5 to 1.5 feet per disposal episode. This method of disposal should prevent mounding of the sediment and minimize the disturbance to the environment. The demonstration area is large enough to contain all of the sediment dredged from the Bar and Entrance Channel on an annual basis. Two circular control areas, 400 yards in diameter, border the demonstration area and are also shown in Figure 5. These control areas will be used for comparing ambient versus project conditions.

  In addition to compliance with all pertinent regulatory requirements, USACE will conduct a literature review regarding the local fisheries and benthic habitats that may be affected by the demonstration project prior to the start of the demonstration project, with special emphasis being given to the crab population. Any potential adverse effects noted from the literature review will be used to revise the planned demonstration project to minimize these effects.

- **Success Criteria:** The success or failure of the demonstration project will be determined based on statistically significant deviations from ambient conditions. The criteria will consider both physical and biological parameters. Whether there is significant mounding in the demonstration area will be determined based on comparing the post minus pre-disposal survey depths between the control and demonstration areas. Similarly crab populations in the control and demonstration areas will be compared to determine if there is a statistically significant difference due to the demonstration project. Additional biological sampling of benthic organisms may also be conducted if it is felt necessary by a consensus of other agencies and stakeholders.

- **Monitoring Program:** The monitoring program will include, but is not limited to, pre- and post- dredge disposal surveys.

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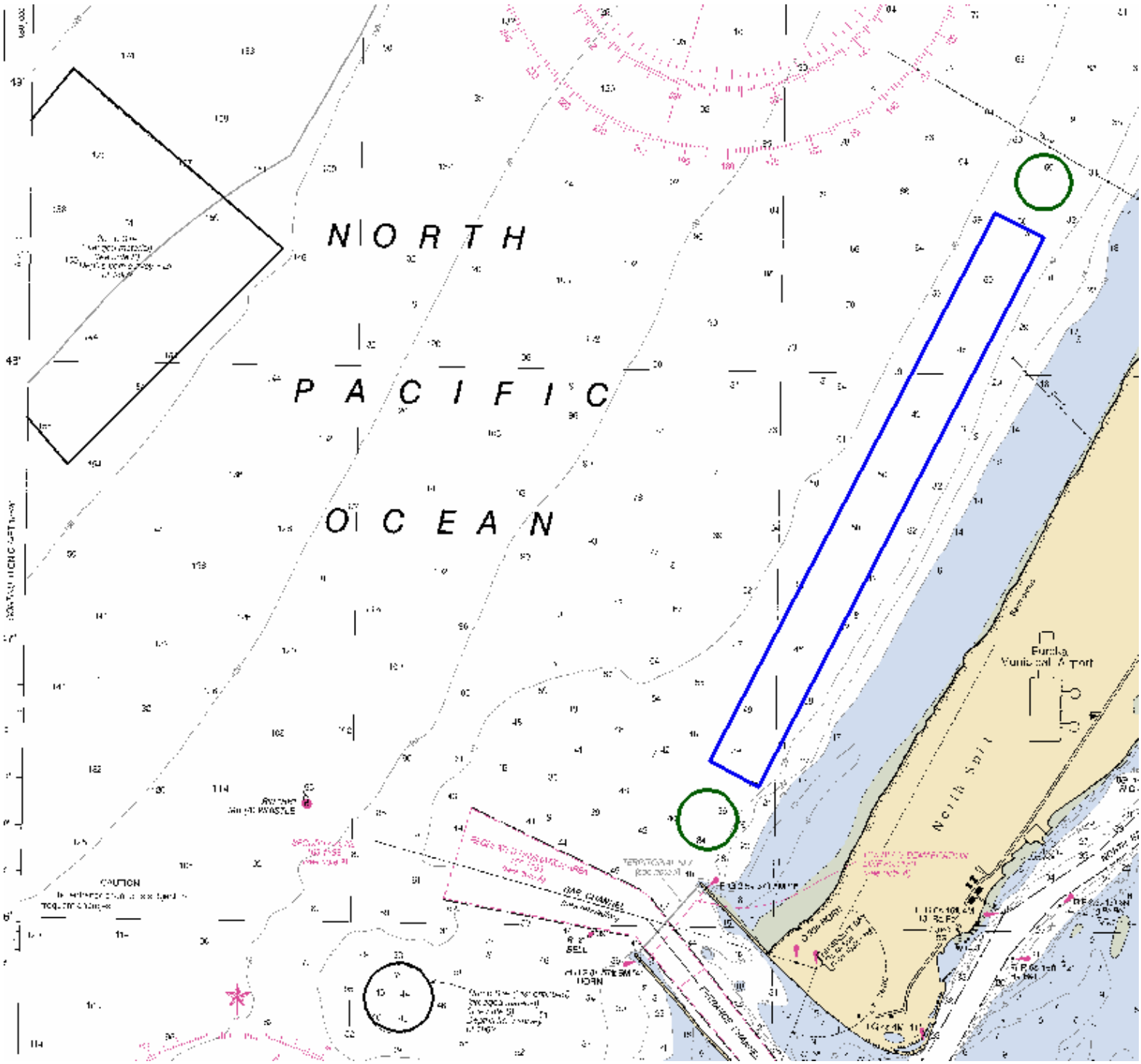
Nearshore Beneficial Reuse Demonstration Project Area



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