US Army Corps of Engineers
Alaska District

Dredged Material Management Plan Environmental Assessment and Finding of No Significant Impact

HOMER SMALL BOAT HARBOR
And
COAST GUARD DOCK
HOMER, ALASKA

Photo provided by the City of Homer

August 2007

Environmental Assessment
and
Finding of No Significant Impact

Dredged Material Management Plan
Homer Small Boat Harbor
and
Coast Guard Dock
Homer, Alaska

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FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act of 1969 as amended, the Alaska District, U.S. Army Corps of Engineers has assessed the environmental impacts of the following action:

Dredged Material Management Plan
Homer Small Boat Harbor and
Coast Guard Dock
Homer, Alaska

The preferred alternative (Alternative 3: permanent berms with geotextile material at the North Dewatering Site) will provide for annual dewatering of approximately 16,000 cubic yards of sand and gravel from the Homer Small Boat Harbor entrance channel and U.S. Coast Guard dock for 20 years commencing in September 2008. The entrance channel and the Coast Guard dock will be dredged in September, and the Coast Guard dock will be dredged again in April. The dredged material will be pumped to a site north of the harbor for dewatering in a bermed dewatering pond. The dredged material is expected to dewater through percolation, but if overflow should occur effluent will be returned to Cook Inlet on the west side of Homer Spit. The turbidity of any effluent will be monitored to ensure that it complies with State of Alaska water quality criteria for marine waters. The dewatered dredged material in excess of the capacity of the dewatering pond will be stockpiled near the pond for use by the City of Homer.

Environmental Considerations. The Dredged Material Management Plan (DMMP) was evaluated for its effects on environmental resources including vegetation, fish and wildlife, and endangered species. The DMMP, as proposed, will not produce significant long-term negative effects on fish or wildlife, or critical habitat for fish and wildlife. The DMMP will comply with the enforceable policies of the Kenai Peninsula Coastal Zone Management Program to the maximum extent practicable. Informal consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service determined that the DMMP would not result in adverse impacts to threatened or endangered species or essential fish habitat. According to the State Historic Preservation Officer (SHPO), there would be no constraints on the project due to cultural resources considerations.

Consistency With Laws and Regulations. The Homer Small Boat Harbor DMMP is consistent with the National Historic Preservation Act, the Endangered Species Act, the National Environmental Policy Act, and the Coastal Zone Management Act to the maximum extent practicable.

The environmental review process has shown that the Homer Harbor DMMP does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an environmental impact statement is not necessary for the Homer Small Boat Harbor and U.S. Coast Guard dock, Homer, Alaska DMMP.

_____ _____

Kevin J. Wilson
Colonel, Corps of Engineers
District Engineer

Date

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1.0 Purpose and Need for the Proposed Action

The Homer Small Boat Harbor was constructed in 1961 under the Rivers and Harbors Act of 3 July 1958, and later expanded under the Rivers and Harbor Act of 19 August 1964 as amended by the Chief of Engineers 21 December 1971. In 1985 a harbor expansion project enlarging the project to a total of 50 acres was completed. The small boat harbor provides sheltered moorage for 1,420 vessels (920 permanent and 500 transient), and is vital to the economy of Homer, Alaska. In addition to the small boat harbor, Homer has deep-water docks that serve freighters, cruise ships, large ferries, and a United States Coast Guard cutter (USCGC) that is vital to public safety. The entrance channel to the Homer Small Boat Harbor and the Coast Guard dock are subject to shoaling and require annual maintenance. Annual dredging of the entrance channel commenced in 1972. The volume of sediments dredged from the entrance channel and the Coast Guard dock from 1993 through 2003 averaged 9,094 cubic yards, but increased to 18,629 cubic yards in 2004 because more volume was dredged at the Coast Guard dock (table 1).

The Coast Guard replaced the 60-year-old USCGC Sedge WLB 402 with a larger, newly constructed B-class seagoing buoy tender, the USCGC Hickory WLB 212. The Hickory requires a deeper berth than the Sedge, and requires dredging annually in September and again in April.

Table 1. Cubic yards of sediments dredged from the Homer Small Boat Harbor and the Coast Guard dock from 1993 through 2004.

Year	Corps (yd^3)	Coast Guard (yd^3)	Total (yd^3)
1993	6,000	2,700	8,700
1994	8,000	2,600	10,600
1995	8,700	2,600	11,300
1996	7,600	3,000	10,600
1997	6,100	2,100	8,200
1998	6,000	2,100	8,100
1999	7,500	3,000	10,500
2000	7,500	3,000	10,500
2001	5,000	Not dredged	5,000
2002	2,100	Not dredged	2,100
2003	4,400	1,900	6,300
2004	7,800	10,800	18,600

Source: U.S. Army Corps of Engineers

All Federally maintained navigation projects must have dewatering site capacity sufficient to accommodate 20 years of dredged material. A preliminary assessment of the Homer Small Boat Harbor determined that the existing dewatering site does not have 20 years capacity under current conditions. The findings of the preliminary assessment report initiated the Dredged Material Management Plan (DMMP). A Dredged Material Project Management Plan (PMP) identified a preferred alternative for the 20-year dewatering of dredged material for which this environmental assessment (EA) is being written.

2.0. Project Location

The Homer Spit extends about 4½ miles into Kachemak Bay and divides Kachemak Bay from Cook Inlet. The project area is on the south end of the Homer Spit at 59° 36' 28 N Latitude, 151° 25' 53 W Longitude. The existing dewatering site is immediately southwest of the harbor, and the proposed north dewatering site is immediately north of the harbor (figure 1).

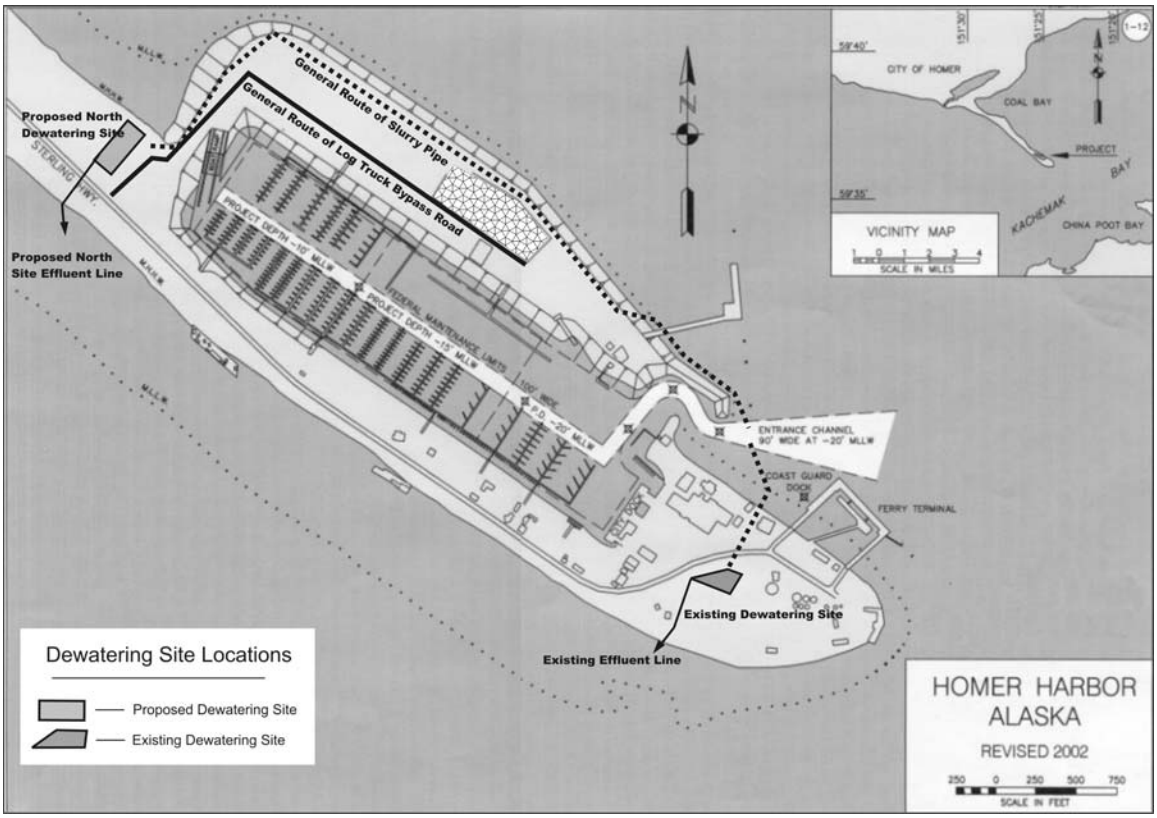

Figure 1. Proposed and existing site locations for Homer Small Boat Harbor dredged material dewatering showing the probable discharge (slurry) and effluent line routes from the sites.

3.0 Alternatives Considered

3.1 No Action

A no-action alternative was considered. Under a no-action alternative, sediments would continue to be disposed of at the current site. Dredging would be shut down during operations and the dewatered sediment would continue to be hauled away during dredging for lack of dewatering space.

3.2 In-water Disposal

Two methods of in-water disposal–direct disposal from the end of a discharge pipe into near-shore waters of Kachemak Bay and transportation by barge or vessel to an offshore site in Lower Cook Inlet–were considered.

3.2.1 Direct In-water Disposal

The Homer Small Boat Harbor is dredged with a hydraulic cutter-head suction dredge, and the dredged materials are pumped as slurry through a pipe. This type of dredging is suitable for near-shore, in-water disposal.

The State of Alaska has designated Kachemak Bay and the marine waters surrounding Homer as the Kachemak Bay Critical Habitat Area (KBCHA). KBCHA waters are home to a large biomass of filter feeders and other invertebrates that require relatively clean water. Discharging slurry created by a hydraulic cutter-head suction dredge could be accompanied by substantial amounts of turbidity, and the direct disposal of slurry near-shore or into a barge for offshore disposal would likely result in unacceptable levels of turbidity in an otherwise relatively clear-water marine environment. Near-shore disposal from the discharge pipeline directly into Kachemak Bay or onto a barge was not selected as the preferred alternative as a result.

3.2.2 Hopper-vessel Transport and Offshore Disposal

Transporting the dredged materials from the harbor site to an open water site offshore in Lower Cook Inlet was also considered. In this alternative a barge or hopper vessel would be loaded with slurry composed of approximately 90 percent water and 10 percent sediment. Both water and sediment would have to be contained in the vessel hoppers because sediment-laden overflow could result in highly unacceptable levels of turbidity in waters of the KBCHA.

Because Kachemak Bay and the marine waters surrounding Homer are within the KBCHA, the water and sediment would likely have to be transported outside the boundaries of the KBCHA. The western boundary of the KBCHA is about 17 miles west of the Homer Small Boat Harbor and extends from Anchor Point to Point Pogibshi, between the communities of Seldovia and English Bay (AS 16.20.590, Kachemak Bay Critical Habitat Area Established). Containment of both the water and sediment components in vessel hoppers would result in inefficient use of the vessel and would require numerous trips to and from an offshore disposal site.

Lower Cook Inlet is considered estuarine within territorial waters where disposal of dredged material is regulated by the Section 404(b) (1) of the Clean Water Act. There

are currently no disposal sites designated in Lower Cook Inlet, and an offshore disposal site in Lower Cook Inlet would likely require a significant amount of biological and hydrological knowledge of the disposal site. Because specific site knowledge is not currently available, an extended and costly scientific data gathering program would likely result.

Offshore disposal by barge or other hopper-type vessel was not selected as the preferred alternative because it would not be cost effective or environmentally preferred. Principal species of marine fish and invertebrates found in Lower Cook Inlet are described in the existing environment section of this EA.

3.3 Upland Dewatering

From an environmental perspective, upland dewatering is the preferred alternative because it is considered to be the most environmentally benign of the dewatering alternatives. Upland dewatering has the environmental benefit of not causing adverse harm to local wildlife or using valuable wildlife habitat. It also provides a source of material for use by the City of Homer for community projects.

Upland dewatering was considered at two sites: (1) the existing dewatering site and (2) a north dewatering site (figure 1). Material dewatered at the existing dewatering site is currently trucked to the proposed north dewatering site for temporary storage.

Three confined dewatering facility (CDF) construction methods were considered for alternatives on the two upland-dewatering sites considered. The methods were: (1) construct a permanent CDF using soldier-pile bulkheads, (2) construct a permanent CDF with available natural materials lined with a geo-textile fabric, and (3) construct a temporary CDF with available natural materials. These methods are summarized below. Construction details are included in the Alternative Section of the DMMP report of which this environmental assessment is part.

Under Method 1, soldier-pile bulkheads would be constructed of replaceable wood bulkheads held in place with steel H-pilings and covered with impermeable membrane. A soldier pile bulkhead would perform effectively, but was eliminated from consideration because of the estimated high cost of construction and maintenance compared with permanent berms in construction method 2 below.

Using Method 2, permanent berms would be formed from native material lined with geotextile fabric for stability and erosion protection. This construction method was selected as the preferred containment alternative plan because it offers the most cost-effective long-term containment of dredged materials with maximum dewatering and minimal cost and maintenance.

In Method 3, temporary berms would be formed using native materials. This construction method was eliminated from consideration because the available materials are porous and subject to slumping. Method 3 temporary berms would be very wide at

the base, require almost constant maintenance, and reduce the holding capacity of the CDF.

The dewatering sites considered in the DMMP are summarized in the following paragraphs.

3.3.1 Existing Dewatering Site

During current dredging operations, a hydraulic cutterhead and pipeline suction dredge is used to dredge the small boat harbor and Coast Guard dock in September and the Coast Guard dock again in April. The dredged sediment is pumped through a portable pipeline from the floating dredge plant to a bermed, triangular-shaped 49,200-square-foot (ft^2) dewatering site on a parcel of city-owned land near the entrance channel along a route similar to that shown in figure 1. Effluent from the existing dewatering site drains approximately 100 yards down a small earthen channel to four, 8-inch-diameter pipes about 40 feet long. The effluent flows to the beach through the pipes where it is diffused to mitigate erosion and discharged on the beach.

The existing dewatering site would not be large enough to efficiently reduce turbidity of the effluent at current pumping rates. The dredge pumps 12 cubic feet per second (ft^3/s) of slurry composed of water and sediment containing 62 percent gravel, 36 percent sand, and 2 percent fines, for up to about 18 hours daily. The fines do not have time to settle out in the existing dewatering site, and effluent with higher turbidity than desired is discharged from the settling pond. Turbidity of the effluent could be reduced by increasing the retention time, increasing the area, or by mechanical devices such as a rapid-sand filter. Increasing the retention time in the available area would require excessive downtime of the dredge to allow for settling. Increasing the area available for dewatering would allow for more productive dredging while enhancing percolation and reducing the required retention time. Mechanical devices such as a rapid-sand filter would likely be a short-term solution and not as efficient as increasing the area or the retention time.

The existing dewatering site currently has 49,200 ft^2 for dewatering and 7,300 ft^2 for storage and RV parking. The considered action alternatives in the DMMP would include expansion of the dewatering area on the existing dewatering site from 49,200 ft^2 to approximately 76,000 ft^2. Expansion of the dewatering area would increase the time the sediments can be retained. Because the discharge rate is 12 ft^3/s and percolation through sand and gravels on the existing site is estimated to be 14.1 ft^3/s, little effluent would be expected to escape from the site after expansion. Effluent released from an expanded area would likely meet ADEC turbidity criteria of less than 25 NTU under 18 AAC 70.020 (2) (A) (i) (24 Turbidly for Marine Water Uses).

In addition to expansion of the usable area, the exposed ditch that potentially adds to the turbidity levels of the effluent after it leaves the dewatering pond and before it gets to Cook Inlet, would be lined or piped to eliminate this potential source of additional turbidity.

Although the existing site would be expanded, it would still not be large enough to hold all the sediment dredged during September. Consequently, dredging would be periodically stopped, and dewatered sediment would be hauled by truck to a storage area being considered as the north dewatering site.

Details of construction for alternatives considered at the existing dewatering site are found in the DMMP Report.

3.3.2 North Dewatering Site

The second upland-dewatering site is a 92,000-ft^2 site just north of the existing harbor (figure 1). This site is currently used as the storage site for the existing dewatering site. The north dewatering site is large enough to hold most of the sediment dredged during September and eliminates the need to haul sediment to a distant storage site. Because the north site better meets the DMMP needs, it is the preferred site and is the only site discussed hereafter.

To transport dredged material to the preferred north dewatering site, slurry containing about 10 to 15 percent solids composed of 62 percent gravel, 36 percent sand, and 2 percent fines would be pumped for up to 18 hours daily through a 12-inch pipe to this site along the east side of the harbor for dewatering on a route similar to that shown in figure 1.

The preferred permanent berm method of CDF construction at the north dewatering site is large enough that no effluent should escape, but an effluent system would be constructed in case it became necessary to discharge effluent. The porosity of the sand and gravel of the Homer Spit on the north dewatering site is high and the percolation rate is estimated to be approximately 17 ft^3/s after interstitial voids in the dredged material are filled with water. The dredge pumps at 12 ft^3 /s, but the CDF would be initially filled at a lower pumping rate to wet the substrate, increase percolation rates, and reduce the probability of producing effluent. The exact initial pumping rate would be determined onsite and the operational pumping rate would be regulated to contain dredged materials and water inside the CDF. The CDF effluent would be monitored during dredging operations to determine the optimum pumping rate. The CDF could go dry during the approximately 6 hours per day the dredge is not operating.

Two discharge plans for handling potential effluent from the north site CDF were considered: (1) pump the effluent uphill through a culvert bored under a paved road where it would flow by gravity to the beach on the ocean (Cook Inlet) side of the spit (figure 1), or (2) gravity flow into the Kachemak Bay side of the spit. Discharge plan 2 was eliminated from consideration because introducing effluent onto the beach on the Kachemak Bay side of the spit (east side) would be unacceptable to the Alaska Department of Fish and Game (Sarzi personal communication). Details of the marine resources on the east side of the spit are in the section that describes the existing environment.

A weir would retain water in the CDF long enough to achieve an effluent turbidity of 25 NTU or less over the ambient turbidity, should the need to release effluent occur. Because the dredged materials contain only 2 percent or fewer fines, most of the dredged material is expected to settle relatively rapidly and retention times are expected to be relatively short as a result.

The retention time required to maintain 25 NTU in effluent released from the north dewatering site is estimated to be about 19 hours. If release of effluent was to occur, its turbidity would be tested daily with a nephelometer to ensure that water quality standards for turbidity were being met. If turbidity of the effluent was found to exceed 25 NTU, the daily pumping volume would be reduced and retention time increased until standards were met. A diffuser would be added to the end of the effluent pipe to mitigate potential erosion of the beach during low tides. Any erosion that occurred would be filled in by wave action and longshore drift during subsequent high tide cycles. The diffuser and pipe on the beach would be removed when dredging operations were completed.

3.4 Selected Alternative

The selected alternative is the DMMP Alternative 3, permanent berms with geotextile fabric at the north dewatering site as described in the Alternative Section of the DMMP Report and reiterated below. This alternative is the most cost effective and least environmentally damaging dewatering and disposal alternative among the six alternatives considered in the DMMP. Details of the selected dewatering alternative and alternatives not selected are described in the Homer Small Boat Harbor DMMP.

3.4.1 Alternative 3: Permanent Berm North Dewatering Site

This alternative would construct permanent berms at the north dewatering site. The berms would require 3,400 yd^3 of material, which would come from 11,600 yd^3 of material excavated from the site for a basin. The remaining 8,200 yd^3 of the excavation would be hauled from the site. The berms would be lined with 19,000 yd^2 of geotextile fabric to reinforce them against slumping. The quantity of geotextile fabric includes a 15 percent overlap. This alternative would have a storage capacity of 9,500 yd^3 of dredged material and would require that some material be removed from the basin to accommodate the expected 16,000 yd^3 of material dredged annually. The project layout is shown in figure 2.

4.0 Project Coordination

This action was coordinated with the City of Homer and Federal and State resource agencies throughout project planning. Coordination for permitting and authorization by State resource agencies including the Department of Natural Resources (ADNR), Department of Environmental Conservation (ADEC), and the Department of Fish and Game (ADF&G) would be conducted through coordination with the ADNR Office of Project Management and Permitting (OPMP). Coordination with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) for informal consultation regarding endangered and threatened species would be directly with those agencies. Essential Fish Habitat (EFH) within the project area is determined from an interactive web site maintained by the NMFS for this purpose. Threatened and

endangered species and essential fish habitat are existing conditions discussed in that section of this EA.

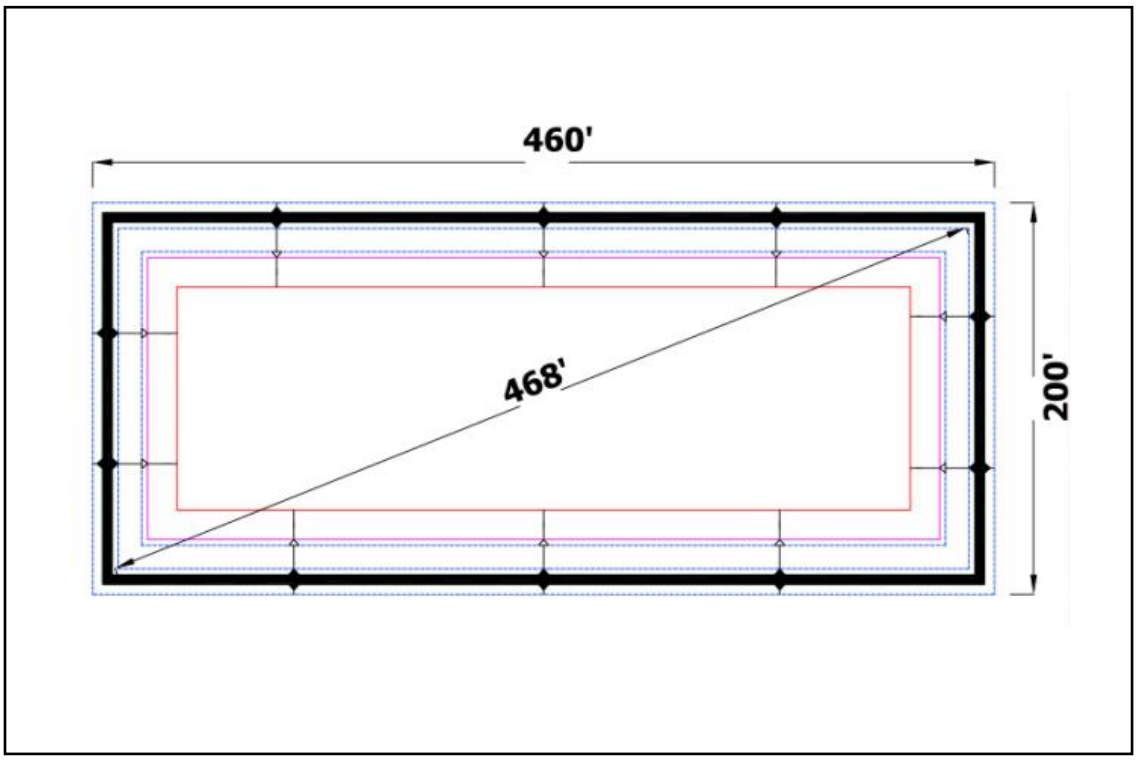

Figure 2. Alternative 3 - Permanent berm with impermeable geotextile at north dewatering site.

4.1 Alaska Coastal Management Program–Alaska Department of Natural Resources

A review of the Kenai Peninsula Borough Coastal Management Plan's (KPBCMP) Enforceable and Administrative Policies (KPB 1990) indicates that the proposed project is consistent with the plan, specifically sections:

2.0 (b) Compliance
2.4 Dredging and filling,
2.5 Dewatering of dredged materials.
4.0 Public access and recreation
4.2 Conflicts with recreational use
4.3 Open space areas
4.4 Public access
12.0 Fish and wildlife habitat
14.0 Archeological

Federal actions within coastal zones of Alaska are required to comply with the Alaska Coastal Management Program (ACMP) and local enforceable policies to the maximum extent practicable. Guidelines for preparing an ACMP consistency determination for Federal activities relative to this dewatering site would be completed. These guidelines

help evaluate Federal actions for specific requirements of the ACMP and assists in determination of compliance with the enforceable policies of local plans. The Alaska District, U.S. Army Corps of Engineers has determined that the Homer Small Boat Harbor DMMP is consistent with the ACMP and Enforceable and Administrative Policies of KPBCMP to the maximum extent practicable. The ADNR OPMP reviews and coordinates coastal management activities in the State of Alaska. The ADNR will review and agree or disagree with the Corps determination.

4.2 Threatened and Endangered Species Management Agencies

The U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) were consulted to determine if threatened or endangered species are in the project area. Informal consultation letters from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service listing ESA species in the project area are included in Appendix A.

4.3 Alaska Department of Environmental Conservation (ADEC)

The discharge of waters into the State of Alaska requires coordination with the ADEC, Division of Water. There is a small possibility that effluent would be discharged from the north dewatering site CDF, and the discharge of effluent into Cook Inlet would require a Section 401 certificate from ADEC. Coordination for renewal of the existing Section 401 certificate (Section 9, Permits) would be done concurrent with coordination with the ADNR for the State ACMP determination.

4.4 Alaska Department of Fish and Game (ADF&G)

The Alaska Department of Fish and Game (ADF&G) permits activities within state game refuges and critical habitat areas. Marine waters surrounding the project site are within the KBCHA, and the possibility of discharge into marine waters of Kachemak Bay requires coordination with the ADF&G for this activity. Coordination for renewal of the existing Special Area Permit from ADF&G (Section 9, Permits) would be done concurrent with coordination for the ACMP determination with the ADNR.

4.5 Corps of Engineers (COE)

Discharge of fill including liquid effluent into waters of the United States requires evaluation under Section 404 (b)(1) of the Clean Water Act. Because discharge of effluent on the beach of Homer Spit is possible, this project was evaluated under guidelines of Section 404(b)(1) in Appendix B.

This DMMP report and environmental assessment was coordinated with the Regulatory Branch of the U.S. Army Corps of Engineers, Alaska District. The north dewatering site is not a wetland as defined by the 1987 Corps of Engineers Wetlands Delineation Manual (COE 1987).

4.6 State Historical Preservation Officer (SHPO)

This disposal action was coordinated with the State Historical Preservation Officer (SHPO). Should any cultural, archeological, or historical artifacts be uncovered as a

result of this project, work would stop immediately and the SHPO contacted for guidance.

5.0 Existing Environmental Conditions

Homer Spit is within the City of Homer, Alaska, and is near the mouth of Kachemak Bay in Lower Cook Inlet. Homer is approximately 125 air miles south of Anchorage. The Spit extends into Kachemak Bay from the southwest shore of the Kenai Peninsula. It is roughly 4½ miles long and varies from 100 to 500 yards in width. Maximum elevation of the spit is about 27 feet above mean sea level. Elevation of the north dewatering site is about 20 feet above mean sea level. Access and egress from the spit is by two-lane state highway that follows the dorsal spine of the spit. The small boat harbor at the southern end of the Spit is the cornerstone for commercial activities in the area. The harbor shelters approximately 1,525 commercial and recreational boats (Alaska District 2002). The Spit is also important for sport fishing, tourism, and recreation.

Winds, waves, and tides combine to redistribute unconsolidated surface sediments on the Spit. Biological communities have developed in equilibrium with this physical environment. Anthropomorphic changes that affected the availability and distribution of these sediments can also affect the physical stability of the Spit as well as the biological communities that occupy the ecosystem. The most important environmental actions by man on the Homer Spit are likely related to changes in the distribution of sediments or changes in sediment transport patterns. Some major actions on the Homer Spit are identified in table 2.

Table 2. Major events and development on the Homer Spit from 1961 through 2002.

Year	Action
1961	Start harbor construction
1964	Great Alaska earthquake with area-wide destruction
1972	Start of annual maintenance dredging
1984	Fishing hole dredged
1985	Harbor expanded from 16.5 acres to 50.0 acres
1995	Industrial basin dredged
1996	Homer Spit repair and erosion reduction
2002	New ferry and Coast Guard dock constructed

5.1 Soils, Geology, and Oceanography

Soils in the area are of the Beluga and Kachemak series. The City of Homer is on a bench underlain by glaciolaucustrine deposits composed of poorly sorted clay and silt. The glaciolaucustrine deposits lay on top of the Kenai formation. The Kenai formation is poorly consolidated and interbedded sandstone, siltstone, and clay stone with minor amounts of conglomerate (Alaska District, 1974). The Spit's foundation is the remnant of a terminal glacial moraine, and is composed of silts, sands, gravels, and some boulders that overlie marine clay.

The Homer Spit is a dynamic system in which change is a normal process. On the exposed coast (Cook Inlet side) the direction of littoral sediment transport is toward the southeast, and the movement of sand-sized material from along shore and also possibly

onshore is a result of wind-generated wave processes. The sheltered environment of Coal Bay (Kachemak Bay side) is a zone of fine-grained sediments that are transported primarily in suspension. The transport direction in Coal Bay converges from the northeast along the north shore of Kachemak Bay and from the southeast along the north shore of Homer Spit. Because of deep water off the distal point of Homer Spit, it is believed that little sediment is transported around to the north shore from the more exposed south shore (Woodward-Clyde, 1980).

The north dewatering site is well-drained sandy soil underlain with gravel and cobbles. There is no hydric soil characteristic of wetlands on the north dewatering site. Material on the beach where effluent might be discharged is round gravel/cobbles at the high tide line grading into sand with gravel at lower tidal elevations. Substrate in the subtidal zone is silt and sand.

The Homer Spit and project location is in a high-risk earthquake hazard zone and might be over topped by a tsunami wave in the event of a major earthquake.

5.2 Sediment Chemistry

Chemical testing in 1992 found relatively high levels of arsenic (As) and chromium (Cr) in the harbor sediments (COE 2002). Harbor sediments were tested again in 2002 with the intention of supporting either upland dewatering or in-water disposal (COE 2002). Because upland dewatering is the preferred dewatering method, this discussion focuses on the results and standards for upland dewatering.

Only sediments from the entrance channel and Coast Guard dock are dredged, and only analysis of these sediments and of samples from the north dewatering site and stockpile are used in this discussion. Concentrations of As and Cr found at these locations by the Corps in 2002 are shown in Table 3.

Table 3. Concentrations of arsenic and chromium found in sediments relevant to the Homer Small Boat Harbor DMMP.

Sample Location	As mg/kg	Cr mg/kg
Center entrance channel	7.3	17.3
Outer entrance channel	5.4	16.7
Coast Guard dock	6.0	23.4
Entrance Group (above 3 values) mean	6.2	19.1
North Dewatering Site	4.0[a]	17.9[a]
Stockpile	5.2[a]	17.1[a]
ADEC ingestion standard	5.5	510
a. Mean sample values		

Because Homer averages 24 inches of precipitation annually (Section 6.4 *Ibid.*), Alaska Department of Environmental Conservation (ADEC) Method Two soil cleanup standards for areas receiving less than 40 inches of precipitation are used for benchmark standards in this EA. Standards for migration to groundwater in areas exceeding 40 inches were initially used by the Corps (2002), but because groundwater as freshwater is not present on the Homer Spit and because precipitation in Homer is less than 40 inches, benchmarks for soil ingestion in areas with under 40 inches of precipitation are used here. Ingestion

benchmarks for As and Cr in the "under 40-inch precipitation zone" are 5.5 mg/kg and 510 mg/kg respectively (Table 3, ADEC 2002). Under these standards the average As value from the entrance channel and Coast Guard dock would slightly exceed the benchmark, but those from the stockpile and dewatering site would not exceed the benchmark, and values for Cr would be well below the benchmark (table 3, ADEC 2002).

Most samples, including the stockpile, originated from the harbor entrance channel or Coast Guard dock. It is not clear whether these concentrations are naturally occurring or due to anthropogenic releases in the harbor (COE 2002).

5.3 Water Quality

Water quality in Kachemak Bay and Lower Cook Inlet is essentially unaltered by the current level of human development, but there are several local sources of potential contamination including fish processing outfalls and releases of petroleum products associated with the harbor.

Natural turbidity around the Homer Spit varies significantly depending where on the Spit the reading is taken, the depth, tide level, and the prevailing wind and current conditions. During periods with high surf or surface runoff, for example, near-shore waters can be extremely turbid for extended periods. The mud flats on the bay side north of the harbor would most likely have higher turbidity readings than on the ocean side or at the end of the Spit because of its shallow depth and the mud in the zone of deposit. Little data to characterize natural turbidity in waters surrounding the Spit exist, but the turbidity readings in table 4 below illustrate the variability in natural turbidity that can exist.

Table 4. Turbidity measurements from Kachemak Bay.

Month/year	Taken by:	Depth	Turbidity (NTU)	Where taken
3/2003	COE	Surface	40	Inside harbor at end of boat ramp
2/2003	ADF&G	Surface	126	Bay side offshore of mudflats between harbor and fishing hole
2/2003	ADF&G	Surface	5	Ocean side off existing effluent pipeline
8/01-12/02	ADF&G	1m off bottom	9.65 (13 month avg.)	Off ferry dock-bay side near end of spit

5.4 Climate

Homer is in the transitional climatic zone between cold interior Alaska and the moderate maritime climate of the Pacific coast. Cool summers and moderate winters are typical. Early summer is usually sunny and relatively dry, but by late summer and fall, cloudy, rainy weather predominates. Summer temperatures average from 45 °F to 65 °F while winter temperatures average from 14 °F to 27 °F (ACED 2004). Average annual accumulated precipitation is 24 inches, including 55 inches of snow. Prevalent winds in summer are from the southwest, shifting to the northwest in winter, with a mean hourly speed of 6.5 miles per hour.

5.5 Tides and Currents

Tides at Homer are semidiurnal, with a pronounced diurnal inequality. The high Coriolis force of the 56-degree latitude and the inlet geometry cause strong crosscurrents and turbulence during both ebb and flood tides. Tide levels at Homer Spit are in table 5. The mean tide range is 20 feet. Tidal currents can reach 3 to 5 knots near constrictions.

Table 5. Tide levels at Homer Spit.

Tide level	Elevation (MLLW)
Estimated Extreme High Water	7.1 meters
Mean Higher High Water	5.5 meters
Mean High Water	5.3 meters
Mean Tide Level	2.8meters
Mean Low Water	0.5 meters
Mean Lower Low Water	0 meters
Estimated Extreme Low Water	-1.7 meters (datum)

The Homer Spit and project location is in a high-risk earthquake hazard zone. Tsunami waves caused by earthquake would be a distinct possibility in the project area.

The Homer Spit is narrow, low in elevation, and very porous. There is no natural underground freshwater of any consequence on the Homer Spit. Freshwater from rain and snowmelt quickly evaporates or percolates into the porous sand and gravel where it is sometimes temporarily perched on localized clay lenses. Salt water percolates underground through the Spit. The ocean-influenced ground water table would rise and lower with the tide.

5.6 Flora and Fauna

Vegetation and wildlife including threatened and endangered species in the general project area are part of the existing conditions. The following sections discuss the more important subjects in these general environmental categories. Discussions lead from a broad overview of the general project area down to what is found on the dewatering site being considered.

5.6.1 Vegetation

The vegetation of the Homer area is classified as coastal hemlock-Sitka spruce forest. Major tree species include Sitka spruce, western and mountain hemlock, balsam poplar, and black cottonwood. Shrub species include alder, devil's club, salmonberry, and willow. Plant species indigenous to a salt-water coastal flat habitat include rockweed (Fucus distichus), Lomentaria hokodatensis yendo (Rhodophyceae), red kale (Rhodymenia palmata), eelgrass (Zostera marina), kelp (Alaria talniata), sugar wrack (Laminaria saccharina), beach rye grass (Elymus mollis), alkali grass (Puccinellia sp.), arrow grass (Triglochin maritima), and plantain (Plantago maritima).

The north dewatering site is disturbed upland habitat that has been used to stockpile sand and gravel from previous dredgings and for a parking lot, but small patches of beach rye grass grow on it during summer. No wetland vegetation is present. Beach rye is not listed as a wetland plant in the National List of plant species that occur in wetlands (FWS 1988). No marine vegetation would be found on the site, but small growths of rockweed

(Fucus sp.) might be found along the intertidal zone where effluent might mix with marine waters of Cook Inlet.

5.6.2 Terrestrial Mammals

The lack of suitable habitat on the Homer Spit limits the establishment of a diverse wildlife community. Large mammals including moose, caribou, brown bear, black bear, wolf, wolverine, mountain goat, coyote, and fox, inhabit the environment in the general Homer area, but are not present on the Homer Spit or the north dewatering site.

5.6.3 Birds.

Most wildlife on the Homer Spit is attracted by the aquatic habitat. Principal among these are birds, marine mammals, and a multitude of marine invertebrates. Kachemak Bay is an important nesting, feeding, and overwintering area for sea birds, shore birds, and waterfowl. During spring and fall, it is an important staging area for migratory birds. More than 16 families and 100 species of birds have been identified as full or part-time inhabitants of the area. Several species of birds commonly feed throughout the year along the intertidal areas. During the ice-free winter months, sea ducks and gulls, as well as crows, and sandpipers, regularly feed along the Spit. Sea ducks and gulls use the Spit year round. Bald eagles also feed in the tidal areas during the winter. The dominant birds at the Homer Spit are oldsquaw sea ducks, gulls (glaucous-winged and mew), harlequin ducks, and bald eagles.

The peak of bird activity on the Homer Spit is from late April to early June. At this time the spring migrants arrive (western sandpipers, dunlins, surfbirds, black-bellied plovers, semipalmated plovers, black turnstones, and ruddy turnstones). These birds feed extensively on the invertebrate fauna in the littoral zone.

The north dewatering site has been disturbed, but gulls, shorebirds or passerine birds would occasionally land on it. Gulls, bald eagles, and shorebirds would also occasionally be found on the beach where effluent might mix with marine waters of Cook Inlet (figure 1).

5.6.4 Marine Mammals

Lower Cook Inlet is habitat for several species of marine mammals. Sea otters inhabit the west side of the inlet from Shakun Rock to Chinitna Point, mainly concentrating around Augustine Island and Cape Douglas. Harbor seals are found throughout Kachemak Bay and along the west side of the inlet up to the Susitna River. Sea lions concentrate primarily on the Barren Islands just south of Cook Inlet. Beluga whales inhabit much of Cook Inlet. Killer whales and harbor and Dall porpoises are commonly observed in the lower inlet. Humpback whales are found in Lower Cook Inlet including Kachemak Bay, and finback whales are present in the pelagic area of Lower Cook Inlet.

Sea otters, Steller sea lions, harbor seals, and beluga whales are found in the near-shore marine waters of Cook Inlet and Kachemak Bay near Homer, but none of these marine mammals are found on the upland north dewatering site. These marine mammals might occasionally be found offshore from where effluent from the north site might mix with the marine waters of Cook Inlet (figure 1).

Large baleen whales including humpback, minke, fin and gray, are occasionally found in the offshore waters of Cook Inlet, and humpback whales might occasionally enter near-shore waters of Kachemak Bay. Orca whales, harbor porpoise, and Dall porpoise also enter Kachemak Bay, but none are found on the north dewatering site or along the beach near where effluent might mix with waters of Cook Inlet (figure 1).

5.6.5 Marine Invertebrates

Dames and Moore (1981) investigated the Homer Spit coastal area for the Alaska Coastal Management Program. The study examined the biology of the marine environment on and around Homer Spit. The tidelands and waters surrounding Homer Spit are in the Kachemak Bay Critical Habitat Area (AS 16.20.230(9)). This area was legislatively designated in 1974 to "protect and preserve habitat especially crucial to the perpetuation of fish and wildlife, and to restrict all other uses not compatible with the primary purpose."

Benthic Marine Invertebrates. The two major components of benthic communities examined by Dames and Moore (1981) were the infauna (animals that live buried in the sediments) and the epifauna (plants and animals that live on the substrate). Infaunal assemblages on the exposed Cook Inlet side of the Spit generally were distributed within subtidal and intertidal zones. The subtidal assemblage is characterized by Polychaete worms, (Lumbrineris luti), (Phyllodoce groenlandica), and (Eteone longa); the gammarid amphipod, (Grandiphoxus sp.); and the marine snail, (Oenopota phyllodoce). The infaunal assemblage at mid- and lower tidal elevations is characterized by small worms, beach hoppers, and pinkneck clams. The southeast side of the Spit has been disturbed and is continually changed by currents to where the infaunal diversity is limited in the area.

The cobble/gravel substrate in the upper tidal zone was characterized by low species diversity and included only oligochaetes and intertidal gammarid amphipods. Species in the lower tidal zones included several species of Polychaete worms, (Scoloplos armiger), (Lumbrineria luti), and (Pholoe minuta), the ribbon worm (Nemertean), and clams, (Macoma inquinata). Observations of divers at seafood processing outfalls is that a thick layer of shellfish covered the seafloor in all surveys except in March, when winter storms left the sandy substrate scoured clean. Many of the animals observed in March had only recently colonized. The assemblages sampled do not represent long-term conditions since they could not tolerate the thick build-up of shell debris observed in May.

A protected mixed-substrate assemblage is in both the intertidal and subtidal zones on the protected Kachemak Bay side of the Spit. A mussel bed associated with kelps (Laminaria saccharina) and (Alaria taeniatra), sea lettuce (Monostroma) and (Ulva), sea stars (Evasterias troschelii) and (Leptasterias ploaris acervata), a sea anemone (Anthopleura artemisia) and the basket cockle (Clinocardium nuttallii) is on the north side of the Spit. The mussel bed is an important year-round feeding area for waterfowl. Macro assemblages at the Seward Fisheries outfall included scavengers such as the green sea urchin (Strongylocentrotus drobachiensis), stalked anemone, Dungeness crab (Cancer

magister), small prickleback, sea stars, and sculpin, (Myoxocephalus polyacanthocephalus), (Dames and Moore, 1981).

No benthic marine invertebrates common to the Kachemak Bay area are found on the north dewatering site, but small numbers of amphipods, barnacles, clams, and mussels would be found along the intertidal zone where effluent might mix with marine waters of Cook Inlet (figure 1).

Larval Crustaceans**.** Crabs and shrimp spend the early part of their life cycles suspended in the water column as larvae. Previous studies (Haynes, 1977) describe several large, stable areas in Kachemak Bay occupied by crab larvae at higher than average abundance for a large portion of their development. Species identified included pink shrimp, humpback shrimp, side striped shrimp, coon striped shrimp, spot shrimp, tanner crab, and king crab.

The only area around Homer Spit where larvae of commercially important crustaceans concentrate appears to be west of the Spit in the vicinity of the habitat occupied by large numbers of egg-bearing female Dungeness crabs (Dames and Moore, 1981). Larval crustaceans would not ordinarily be found on the north dewatering site, but some might be introduced to the site with the dredged water. Larval crustaceans might also be found along the beach near where effluent might mix with the marine waters of Cook Inlet (figure 1).

5.6.6 Near-Shore Fish

Waters in the vicinity of Homer Spit serve as near-shore migration and feeding routes for adult and juvenile salmon. Pink salmon (Oncorhynchus gorbuscha), coho salmon (O. kisutch) and chum salmon, (O. keta), were the most common salmon species found in catches made around the Spit (Dames and Moore, 1981). Some of the other more abundant fish species found in the area includes Pacific sand lance, capelin, Pacific staghorn sculpin, surf smelt, Dolly Varden, halibut, and Chinook salmon. Kachemak Bay has historically supported a thriving fishing industry and has become increasingly popular for its recreational fisheries. Several species of small schooling forage fish are abundant and are important to the diet of larger pelagic fish such as salmon. These forage fish include Pacific herring, capelin, Pacific sand lance, and surf smelt. Some species of forage fish are known to spawn in unconsolidated intertidal sediments and there are some documented spawning areas near the southern end of the Spit (Dames and Moore 1981). The east side of the Homer Spit is important habitat for juvenile coho salmon (Sarzi personal communication).

Fish are not naturally present on the north dewatering site, but an occasional larval or small fish might arrive on the site with the dredge water. Larval or small fish might also be present along the beach where effluent from the site might mix with marine waters of Cook Inlet (figure 1).

5.6.7 Offshore Fish and Invertebrates

Marine waters of Cook Inlet outside the western limit of the KBCHA are about 40 fathoms (240 feet) deep. Shoals that likely result from Pleistocene moraines that elevate the sea bottom to about 17 to 30 fathoms (102 to 180 feet) are present. The sea bottom in central Cook Inlet is mostly sand with shells, but some hard and rocky substrate is found. NOAA marine chart number 1640 describes the depth and bottom types in Lower Cook Inlet.

Lower Cook Inlet is famous for its Pacific halibut fishery and many charter sports fishing vessels that fish in Lower Cook Inlet moor in the Homer Small Boat Harbor. These charter vessels range from about 30 to 50 feet long and carry from 6 to 12 or more sport fishers on day and occasionally overnight fishing trips. Lower Cook Inlet is a nursery for Pacific halibut and these chartered vessels harvest thousands of Pacific halibut annually from these waters. Most of the halibut harvested are in the 20 to 60 pound range, but halibut weighing from 300 to 400 pounds are occasionally caught. Sport fishers are limited to 2 halibut per day per person.

Alaska has roughly 475 species of marine fish and several more species of anadromous fish (Mecklenburg et al. 2002). Many of these marine and anadromous species are found in Lower Cook Inlet waters including any reasonable area that could be designated for open-offshore dumping of dredged sediments from the Homer Small Boat Harbor. Species with commercial, personal-use or subsistence importance include Pacific halibut, Pacific cod, pollock, rockfishes, Pacific salmon, and Pacific herring, among many other species. Lower Cook inlet also supports a large biomass of forage fish and invertebrates needed to feed these larger species of fish.

Lower Cook Inlet also supports a large biomass of invertebrates, most of which are important as forage for large populations of predatory fish, or for commercial, personal, or subsistence use. These invertebrates include several species of Pandalid and Crangonid shrimp, and king and tanner crabs. Bivalve mollusks are especially abundant in some areas. These include several species of clams including the razor clam, snails, and mussels. Inner Kachemak Bay also supports several oyster farms that raise oysters from spat for commercial sale.

Juveniles of many offshore species also at least seasonally occupy near-shore waters. Although none of these species would be found on the north dewatering site, the larvae of some of these species might be transported to the site with dredged water. The larvae or juveniles of some of these offshore species might be found along beach near where the effluent from the site might mix with marine waters of Cook Inlet (Figure 1).

5.7 Threatened and Endangered Species

Several wildlife species listed as threatened or endangered are part of the existing conditions near Homer. The southwest population of sea otters was listed as threatened on August 9, 2005. Sea otters frequent the existing harbor and general Lower Cook Inlet-Kachemak Bay project area, but they are not individuals of the listed population

(Appendix 1, FWS letter of 10 August 2005). Sea otters found at Homer are, however, candidates for listing in the future.

A September 12, 200, news release by the U.S. Fish and Wildlife Service reported an unusual mortality event (UME) among sea otters in Kachemak Bay (FWS 2006). The cause of the UME was allegedly a bacterial infection caused by Streptococcus bovis/equinus. The impact of this UME on the abundance of sea otters in Kachemak Bay is under study. Sea otters in Kachemak Bay might be considered a species deserving extended protection as a result of this UME.

Steller's eider, a threatened sea duck, winters in near and offshore waters near Homer. Joint surveys by the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers, Alaska District during the winter of 2002-2003 indicate that up to 300 threatened Steller's eiders spend the winter in shallow waters up to a mile or more offshore on the Cook Inlet side of the Spit. These Steller's eiders are believed to arrive in the Homer area in November and depart during March or early April. Steller's eiders are a near-shore-feeding species that has suffered substantial population declines in Alaska. Larger populations exist in Russia and northern European countries, but only the Alaska breeding population was listed as threatened under the Endangered Species Act (ESA). Much of the eastern Russia population and all of the Alaska population are believed to winter in Alaska. The Russian population cannot be distinguished from the Alaska population, consequently both populations are considered threatened in Alaska. The Fish and Wildlife Service has not designated Cook Inlet as critical habitat for Steller's eiders.

Kittlitz's murrelet, a small seabird, is listed as a candidate for threatened or endangered status. The center of abundance for Kittlitz's murrelets is Glacier Bay in Southeast Alaska, but small numbers of this murrelet may be found in marine waters offshore of Homer Spit. Nesting is associated with glaciers and at higher elevations than the Homer Spit.

Steller sea lions are composed of two stocks, the western and the eastern stock. The stocks are divided at 144° west longitude in the Gulf of Alaska. Steller's sea lions west of 144° west longitude are listed as endangered and sea lions east of 144° west longitude are listed as threatened. Sea lions from the western stock are frequent visitors to the existing harbor and the project area.

At least two species of endangered baleen whales inhabit Lower Cook Inlet, but only the humpback whale is likely to be found in Kachemak Bay. The other species of endangered baleen whale is the finback, but they do not range in the project area (ADF&G et al. 1996).

Other endangered, threatened, and candidate species considered by the Corps of Engineers include: Northern right whale, sei whale, bowhead whale, sperm whale, blue whale, spectacled eider, Eskimo curlew, Aleutian shield fern, Snake River sockeye salmon, Snake River spring and summer Chinook salmon, Snake River fall Chinook salmon, lower Columbia River Chinook salmon, Puget Sound Chinook salmon, upper

Willamette River Chinook salmon, upper Columbia spring Chinook salmon, upper Columbia River steelhead, Snake River basin steelhead, lower Columbia River steelhead, upper Willamette River steelhead, and the middle Columbia River steelhead. These species are found in Alaska (USFWS 2002). Small numbers of the listed Chinook salmon stocks could possibly be present in the Lower Cook Inlet area during winter as "feeder kings."

No threatened or endangered species are found on the north dewatering site. Steller's eiders and Kittlitz's murrelets occupy near and offshore waters around Homer Spit, but only Kittlitz's murrelets would likely be present when dredging and dewatering are active. Steller's eiders are generally present from about late November through late March.

5.8 Essential Fish Habitat

In 1996, the Magnuson-Stevens Act was re-authorized and changed by amendments to emphasize the sustainability of the nation's fisheries and establish a new standard by requiring that fisheries be managed at maximum sustainable levels and that new approaches be taken in habitat conservation. This habitat is called "Essential Fish Habitat" (EFH). The NMFS interactive web page was consulted to delineate EFH for listed species. The following commercial species are designated EFH in Cook Inlet and Kachemak Bay adjacent to the project site.

Table 6. Species with essential fish habitat in the general Homer Spit area.

Species	Life phases found on EFH	
Yellowfin sole	Adult	Late juvenile
Sculpin	Adult	Late juvenile
Rex sole	Adult	Late juvenile
Walleye pollock	Adult	Late Juvenile
Flathead sole	Adult	Late Juvenile
Pacific cod	Adult	Late Juvenile
Arrow tooth flounder	Adult	Late Juvenile
Pacific salmon (5 species)	Adult	Early-late juvenile

Because the north dewatering site is upland, only the larvae or juveniles of these EFH species that might be transported to the site with dredged water would be found there. Larval or juvenile forms of EFH species might also be found along beach where effluent from the site might mix with the marine waters of Cook Inlet (figure 1).

5.9 Sport and Personal Use Fishing

Sport fishing and personal use fishing activities are plentiful in the Homer area. The seasons for some activities that would result in use of the harbor are:

Table 7. Sport and personal use fishing activity in the Homer Spit area.

Activity	Season
Coho salmon personal use gillnet	August 16 to a 1,000 to 2,000 fish harvest
Herring personal use	January 1-December 31
Tanner crab personal use	July 15-December 31, January 15-March 15
Clams personal use	January 1-December 31
Halibut sport fish	February 1-December 31
King salmon sport fish	January 1-December 31

The peak times for most of these activities are during the summer and generally conclude with Labor Day in early September and the return of children to area schools.

No sport fishing would be done on the north dewatering site, but persons might sport fish from the beaches where effluent from the site might mix with marine waters of Cook Inlet (figure 1). People sport fishing in nearby waters might park on the north dewatering site when it is not being used for dewatering.

5.10 Cultural Resources

The cultural origins of the Homer area derive from several waves of migration and settlement with the more recent extending from Kodiak Island. These cultures are mostly distinguished from one another by the style of tools they produced. The first ancient people to occupy the area may have been people with Paleoarctic traditions. People of the Ocean Bay traditions followed the Paleoarctic tradition people. Kodiak tradition people followed the Ocean Bay people, and in the Homer area the Kodiak tradition people evolved into the Kachemak stage people.

Two archeological sites are known on Homer Spit. The first, near the north end of the Spit, is a thin-layered shell midden. Similarly, there is another thin-layered shell midden near the small boat harbor. It is unlikely that either of these sites still exist due to Spit erosion. The north dewatering site (figure 1) is not known to have been a cultural or historical site, or to contain cultural or historical artifacts.

5.11 Existing Dredging and Dewatering

Dredging of the harbor basin and Coast Guard dock, and dewatering of sediments in the existing site and stockpiling of sediment at the north site being evaluated for long-term dewatering in this EA are part of the existing environment. Additional information on the existing dewatering site is in Section 3.4.1. Homer harbor was constructed in 1961 and expanded in 1965 and 1985 (COE 2004). Maintenance dredging of the harbor basin started in 1972, and dredging of the new Coast Guard dock started in 2003. Dewatering of sediments currently occurs at the existing dewatering site, and the sediments are later stockpiled at the proposed north dewatering site (figure 1). Up to about 8,000 cubic yards of sediment from the harbor and Coast Guard dock are currently stockpiled on the north dewatering site being considered.

5.12 Refuges and State Critical Habitat Areas.

Kachemak Bay is established as critical wildlife habitat by AS 16.20.590 and managed by the Alaska Department of Fish and Game. Critical habitat includes all tide and submerged lands under State jurisdiction. The Federal wildlife refuge nearest to Homer Spit is the Kenai Wildlife Refuge north and east of Homer. Kachemak Bay State Park is 2.6 miles across Kachemak Bay from the Homer Spit and project site. The closest point in the Alaska Maritime National Wildlife Refuge is the Barren Islands near the entrance to Lower Cook Inlet.

6.0 Environmental Consequences

The Corps believes that the preferred and selected alternative, DMMP Alternative 3 permanent berms with geotextile fabric at the north dewatering site would not cause adverse harm to local wildlife or habitat. The dredging window is from July 16 through April 30 annually, but dredging in the harbor entrance channel typically takes place during the second week of September and lasts about 2 weeks. Dredging at the Coast Guard dock would typically take place during the September period and again during April if needed to maintain adequate moorage depth at the dock. Dewatering at the north dewatering site would coincide with the dredging periods.

6.1 Water Quality

Nearly all the water that accompanies the dredged material to the north dewatering site CDF is expected to percolate through the highly porous sand and gravel substrate present on the Homer Spit. The percolated effluent would combine with the marine waters under the Spit, but some might seep out along the tideline on the Kachemak Bay side of the Spit during extreme low tides. Effluent seeping through the substrate under the pit would have the benefit of sand filtration, would be clean, and have salinity similar to the water of Kachemak Bay.

Small amounts of water might escape the CDF as effluent to the Cook Inlet (west) side of the Spit where it would mix with the marine water (figure 1). If effluent was discharged into Cook Inlet, it would meet state water quality standards of 25 NTU or less. The entire project is of 2 weeks duration and no short or long-term impacts or adverse harm to the marine environment or sessile organisms because of degraded water quality are expected as a result of this dewatering.

6.2 Sediment

Sediments dredged from the harbor range from about 7 to 17 mg arsenic per kg of sediment, and are above the state standard for ingestion of 5.5 mg arsenic per kg of sediment. The consequences of arsenic levels slightly higher than in the standards for ingestion in this situation are not critical because it is unlikely that people would eat the mostly sand temporarily stockpiled on the north dewatering site. Small amounts of the stockpiled material might become airborne as dust, but ADEC has no benchmark for inhaled arsenic (ADEC 2002), and any arsenic in the stockpile would be very similar in concentration to that in the surrounding soils.

6.3 Vegetation

Small patches of beach rye grow on the north dewatering site during summer when it is not used for dewatering or storage of dredged sediments. These small patches of beach rye would likely be destroyed during dewatering activities. Small quantities of planktonic algae from the harbor might be entrained with the dredged water and be discharged in the CDF. These algae would likely be destroyed.

6.4 Wildlife

Dewatering at the north site would not harm birds and would have no effect on terrestrial or marine mammals. Some marine invertebrates and larvae, and some small fish and larvae temporarily in the harbor or that have established in the harbor since the previous year's dredging might be entrained to the dewatering site with dredged water. Any marine life arriving on the dewatering site with dredged water would likely be killed by the dredge or by desiccation when the dewatering site dewaters. The probability of any organisms returning to Cook Inlet with effluent overflow would be low.

6.5 Endangered Species

Steller's eider, a threatened sea duck, would not be in the area during dewatering and the sea duck or its habitat would not be harmed. Endangered sea lions would not be harmed by dewatering or dewatering on the north dewatering site. The closest rookery for sea lions is on the Barren Islands about 60 miles southwest of the project. Upland dewatering, dewatering, or effluent release would not harm endangered whales in Cook Inlet or Kachemak Bay. Upland dewatering, dewatering, or effluent release would not harm candidate Kittlitz's murrelet. Candidate sea otters are found in the harbor and offshore of the Homer Spit. Sea otters would not be harmed by dewatering or by any effluent that might escape the north site CDF. Small numbers of endangered Chinook salmon from the Puget Sound area of Washington State might be found in Lower Cook Inlet including Kachemak Bay. These fish would not be harmed by this dewatering action.

6.6 Essential Fish Habitat

Upland dewatering on the north dewatering site would not have any affect on EFH. Little, if any, effluent would discharge to marine waters of Cook Inlet. Any effluent that is discharged on the beach would meet State water quality standards and not result in any adverse effect on EFH.

6.7 Social Conflicts

The work would be conducted before the summer season and after Labor Day in September when peak human use of the area has subsided to low levels. A small personal use fishery for coho salmon is sometimes conducted in Kachemak Bay during September, but is mostly over during the last week in August. Small boats exiting the harbor would not be affected by dewatering of sediments on the north dewatering site.

Sport fishing for stocked coho salmon in a dredged basin immediately north of the north dewatering site continues until late September. Available parking used by people with motor homes who participate in this fishery could be slightly reduced because a portion

of the parking area traditionally used for this fishery might be used for dewatering. Enough parking on the west and north end of the fishing hole should be available for the relatively small number of people who participate in this late-season fishery. Water quality in the dredged sport-fishing basin would not be affected by dewatering because any resulting effluent would be discharged into Cook Inlet.

6.8 Environmental Justice

This project would not cause disproportionate impacts to low-income people. Benefits to local low-income people are expected by providing continued safe moorage of boats used for income producing and subsistence gathering activities.

6.9 Protection of Children

This action would not disproportionately affect children. The nearest school is more than 4 miles from the project. Local children would benefit because continued maintenance dredging of the harbor would allow their parents safer access to subsistence resources and enhance their ability to provide beneficial monetary income through commercial fishing and other water-based income producing activities.

7.0 Mitigation

No mitigation is required for this DMMP because dewatering of the dredged material at the north dewatering site would not cause adverse harm to the human environment, wildlife, habitat, or cultural resources.

8.0 Permits

This DMMP would be a modification and extension of, and improvement to, the existing dewatering plan. The preferred alternative of discharge directly into a CDF at the north dewatering site would reduce or potentially eliminate discharge of dewatering effluent into the Cook Inlet side of Homer Spit, and eliminate the need to haul and stockpile elsewhere sediment during dredging. The dredge pipeline to the north dewatering site would have to be repositioned through a developed area along the east side of the harbor (figure 1). Dewatered dredged material discharged on the north dewatering site might be removed from the CDF by the City of Homer for beneficial uses.

This DMMP would require amendments to or re-issuance of the below permits.

Table 7. Permits, certificates, and determinations required.

Permit	Number	Issued	Expiration
Special Area Permit (Amendment III)	98-II-0656	07/15/02	12/31/04
Coastal Consistency Determination [b]	b	b	b
Certificate of Reasonable Assurance [a]	AK930506-08AA	07/06/93	Indefinite

a. New certificate would be required because of project modifications.
b. New determination would be required because of project modifications.

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Appendix A

Endangered Species Consultation

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

January 28, 2003

Guy McConnell
U.S. Army Corps of Engineers
Alaska District
EN-CW-ER (Bartlett)
P.O. Box 898
Anchorage, Alaska 99506

Re: Dredged Material Management Plan for the Homer Small Boat Harbor

Attn: Larry Bartlett

Dear Mr. McConnell:

The Corps of Engineers, Alaska District (Corps) has requested comments from the National Marine Fisheries Service (NMFS) on its proposal to develop alternatives for a 20-year Dredged Material Management Plan (DMMP) for the Homer small boat harbor. The Corps is requesting NMFS provide a species list under the Endangered Species Act (ESA), and preliminary recommendations concerning potential impacts to Essential Fish Habitat (EFH).

Endangered Species Act (ESA)

Section 7(a)(2) of the ESA directs interagency cooperation "to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species" or result in the destruction or adverse modification of critical habitat. NMFS Alaska Region is responsible for the administration of the ESA as it applies to certain cetaceans, pinnipeds, and marine fish. These include several species of whales (the fin, right, humpback, blue, sperm, sei and bowhead), Pacific salmon[1], and the western population of Steller sea lions.

Steller sea lions occur in marine waters near Homer and within Kachemak Bay. However, no significant haulouts or rookeries

[1] Several Northwest Pacific salmon stocks grow to maturity in offshore areas of Alaska. Several of these stocks are listed as an endangered species. Please see the Summary of Salmon & Steelhead Listings at http://www.nwr.noaa.gov/ for further information. Any consultation requirements will need to be coordinated with the NMFS Northwest Region, Habitat Division, Portland, Oregon at (503)231-6880.

are recorded near the proposed site. The nearest Steller sea lion major haulout and rookery are located on Ushagat and Sugarloaf Islands, respectively, some 50 nautical miles southwest of Homer in the Barren Island group.

If Steller sea lions are present within the project area, NMFS requests that any in-water activities cease and for you to contact our office at (907) 271-5006 for further guidance. In the event of an emergency, or after normal work hours and on weekends, please contact our local Homer NOAA Fisheries Office of Enforcement at (907) 235-2337 for detailed assistance.

Endangered humpback whales occur in the near shore waters of Cook Inlet, mostly during the spring through fall months. However, they are very rarely observed near this area and would not be expected to occur at the project site.

No critical habitat for the above listed species has been identified within this project area.

Marine Mammals Species

Marine mammal species which associate with marine waters near Homer include minke, killer, and beluga whales, Dalls' and harbor porpoises, and harbor seals. However, none of these marine mammals are likely to be present within the project area.

Essential Fish Habitat (EFH)

EFH is not identified for upland areas. However, in the proposed project area, any in-water disposal area would be considered EFH. EFH has been designated in waters for anadromous fish, specifically salmon, and certain life stages of marine fish under NMFS' jurisdiction. For specific EFH information regarding your project area, please visit our web site at:

http://www.fakr.noaa.gov/habitat/

The trigger for EFH consultation is a federal action agency's determination that an action may adversely affect EFH. If a federal action agency determines that an action will not adversely affect EFH, no consultation is required, and the federal action agency is not required to contact NMFS about its determination. Any action that may adversely affect EFH

should include an EFH assessment in either a separate document or be clearly referenced in a supporting document, such as an environmental assessment for the project. An EFH assessment is outlined in 50 CFR Part 600.920. A clearly referenced EFH assessment will satisfy the requirements of the provisions regarding EFH within the administration of the Magnuson-Stevens Fishery Conservation and Management Act. At this time, we do not offer any opinion regarding the effects of the activity on EFH resources.

We hope this information is useful to you in fulfilling any requirements under section 7 of the ESA and EFH requirements under the Magnuson-Stevens Act. We look forward to working with you throughout the project. Please direct any questions to Matthew P. Eagleton in our Anchorage field office at (907) 271-5006.

Sincerely,

For James W. Balsiger
Administrator, Alaska Region

cc: EPA, ADGC, ADEC, USFWS, ADFG - Anchorage

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Anchorage Fish & Wildlife Field Office
605 West 4th Avenue, Room G-61
Anchorage, Alaska 99501-2249

in reply refer to
AFWFO

August 10, 2005

Mr. Larry Bartlett
Department of the Army
US Corps of Engineers
PO Box 898
Anchorage, Alaska 99506-0898

Re: Threatened and endangered species list for Homer, Alaska (*consultation number 2003101*)

Dear Mr. Bartlett,

This responds to your January 16, 2003, request for a list of endangered and threatened species and critical habitats, pursuant to section 7 of the Endangered Species Act of 1973, (16 U.S.C. 1531 et seq: 87 stat 884, as amended; Act), that are likely to occur in the vicinity of Homer, Alaska. It is unclear to me why there was no response to your initial request for a species list, and I'd like to express our apology for this oversight. Regardless, as your preferred alternative is just now being finalized, and species lists must be verified every 90 days [50 CFR §402.12(e)], the timing of this response is appropriate.

Steller's eiders (*Polysticta stelleri*) listed as threatened under the Act in 1997, winter in the shallow waters of Lower Cook Inlet. Steller's eiders are a nearshore-feeding species that has suffered substantial population declines in Alaska. Critical habitat for this species was designated on February 2, 2001. There is no critical habitat designated in the vicinity of this proposed project.

During the winter of 2002-2003, the Army Corps of Engineers (ACOE) and the U.S. Fish and Wildlife Service (Service) jointly conducted surveys that indicate up to 300 eiders winter in the shallow waters up to a mile and more offshore on the Cook Inlet side of the Homer spit (ACOE 2005). These Steller's eiders are believed to arrive in the Homer area in November and depart during March or early April.

The southwest Alaska population of **sea otters** (*Enhydra lutris kenyoni*) was listed as threatened under the Act on August 9, 2005. While sea otters frequent the existing harbor and general lower Cook Inlet-Kachemak Bay project area, they are not individuals from the southwest Alaska population.

Kittlitz's murrelets (*Brachyramphus brevirostris*) were listed as candidate species under the Act in May, 2004. In winter, few Kittlitz's murrelets occur in the protected waters of Kachemak Bay, and research is currently underway to understand the importance of Lower Cook Inlet/Kachemak Bay during the breeding season.

This letter relates only to federally listed or proposed species and/or designated or proposed critical habitat under our jurisdiction. It does not address species under the jurisdiction of National Marine Fisheries Service, or other legislation or responsibilities under the Fish and Wildlife Coordination Act, Clean Water Act, National Environmental Policy Act, Migratory Bird Treaty Act, or Bald and Golden Eagle Protection Act.

We look forward to further cooperation on this project. If you have any questions please contact me at (907) 271-1467 or Charla Sterne at (907) 271-2781. In future correspondences regarding this project please refer to consultation number 2003101.

Sincerely,

Ellen W. Lance
Endangered Species Biologist

Literature Cited

US Army Corps of Engineers. 2005. Homer Harbor and U.S. Coast Guard Dock Dredged Material Maintenance Program (DMMP) at Homer, Alaska – Draft Environmental Assessment and Finding of No Significant Impact. U.S. Army Corps of Engineers, Alaska District, Alaska.

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Appendix B
CWA Section 404(b)(1) Guideline Evaluation

Evaluation of Dredged Sediment Effluent Discharge Into Cook Inlet, Homer, Alaska

I. PROJECT DESCRIPTION

This project is a Dredged Material Management Plan (DMMP) that would plan for the disposal of 16,000 yd^3 of sand and gravel annually dredged from the entrance channel of the Homer Small Boat Harbor and from the Coast Guard dock, for 20 years. The sand and gravel is composed of 2 percent silt that would result in turbid effluent unless settled out in a confined disposal facility (CDF). Discharge of effluent into near-shore marine waters of Kachemak Bay requires evaluation of the discharge under Section 404(b)(1) of the Clean Water Act. Discharge of effluent into waters of the United States may not be necessary because of the porosity of the soils under the CDF sites considered. This 404(b)(1) evaluation is prepared in the event effluent is discharged into near-shore marine waters of Kachemak Bay.

This project considered in-water disposal directly in near-shore waters off the Homer Spit, offshore disposal in Lower Cook Inlet, and upland dewatering in one of two sites where a CDF would be built. Near-shore disposal in-water was eliminated from consideration because the Alaska Department of Fish and Game area biologist verbally objected to discharge of effluent into waters of the Kachemak Bay Critical Habitat Area (KBCHA) that surrounds the Homer Spit. Offshore disposal in Lower Cook Inlet was eliminated from consideration because an offshore disposal site in Lower Cook Inlet has not been designated and the small quantity of material that results from dredging in Homer does not justify the expense of designation.

Upland disposal at two locations, the existing dewatering site and a north dewatering site, was considered. The entrance channel would be dredged annually during September, while the Coast Guard dock would be dredged in April and for a second time in September with the entrance channel.

Upland dewatering alternatives considered bins, temporary berms and permanent berms for confinement. Permanent berms at the north dewatering site, as described in the accompanying DMMP and environmental assessment were selected for the Base Economic DMMP.

The future quantity dredged during September is projected to be approximately 11,000yd^3. Dredging during April would add an additional 5,000 yd^3 for an expected total of 16,000 yd^3. The base DMMP alternative has a capacity of 9,500 yd^3 and would need to be excavated at least once during and after the September dredging to accept the entire 16,000 yd3 estimated. Removal of the sediment from the CDF as described above would allow the north dewatering site to exceed the 20-year capacity requirement of the DMMP. Surplus materials removed from the CDF would be stored nearby and eventually used by the City of Homer for permitted beneficial purposes.

II. FACTUAL DETERMINATION

A. Physical Substrate Determination

The composition of sediment from the harbor basin and entrance channel was characterized from samples. Sieve and hydrometer analyses were conducted on both dredged material samples. The analyses of the basin sample characterized the material as well-graded sandy gravel. The sample was composed of 62 percent gravel, 36 percent sand, and 2 percent fines. The analyses of the entrance channel sample characterized the material as poorly graded gravel. The sample was composed of 98 percent gravel, 2 percent sand, and 0.2 percent fines. Both samples exhibited non-plastic fines with a specific gravity of 2.7. This project would transfer approximately 16,000 yd^3 of this material to an upland sit on the Homer Spit. An unknown portion of the material could eventually reenter the marine environment as beach nourishment.

B. Water Circulation, Fluctuations, and Salinity Determinations

This project would not affect water circulation, fluctuations or salinity.

C. Suspended Particulate/Turbidity Determinations

This project would result in temporary and minor turbidity in vicinity of the cutter head while dredging. Effluent from the dewatering CDF, if any, is expected to be within the State of Alaska Water Quality Standard of 25 NTU for discharge in marine waters.

D. Contaminant Determination

Dredged material from the Homer Small Boat Harbor was chemically characterized in 2002 and concentrations of the metals arsenic and chromium were found to exceed State of Alaska soil cleanup standards for upland dewatering. The concentrations of arsenic and chromium were found to be similar to concentrations found in the surface soils of the proposed North Dewatering Site that had formally been used as a storage site for dredged material dewatered at the existing site.

E. Aquatic Ecosystems and Organism Determinations

Small numbers of marine worms and crustaceans that colonize the dredged areas between dredgings would be destroyed as they are dredged and transported to the dewatering CDF.

Marine waters surrounding Homer Spit and the project site are a special aquatic ecosystem designated a critical habitat area, the Kachemak Bay Critical Habitat Area (KBHCA), by the State of Alaska. This project might introduce small volumes of effluent that meets State water quality standards into the KBHCA. This effluent is not expected to affect the KBHCA or the marine animals that inhabit it.

F. Proposed Disposal Site Determinations

In-water near-shore and offshore disposal would likely result in harm to marine organisms including fish, crustaceans and mollusks, their eggs and larvae. The selected upland disposal alternative will not affect wetlands or cultural sites, and will not significantly disrupt recreation or commercial activities on the Homer Spit.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

This project would remove approximately 320,000 yards of sand and gravel from the nearshore marine environment over the 20-year life of the DMMP. Some recently colonized invertebrates, mostly Polychaete worms and juvenile clams would be killed through dredging. The net physical result of removal by dredging could be a slight increase in longshore drift near the source of the material. An unknown portion of the material would reenter the environment if used as beach nourishment. Beach nourishment would slow longshore drift through replacement of sediments. Beach nourishment would not result in significant effects, adverse or otherwise, on intertidal or subtidal invertebrates on the Homer Spit.

Maintenance dredging of the Homer Harbor entrance channel has been ongoing since 1972 and precedes most other modern dredging activities on the Homer Spit. The cumulative effect of more recent dredging activities including the fishing lagoon and Coast Guard dock with dredging the harbor entrance channel is an overall net loss or significant change in natural habitat available to marine invertebrates.

H. Determination of Secondary Effects on the Aquatic Ecosystem.

Removal of as small a quantity as is removed annually at Homer would have negligible secondary effects on the aquatic ecosystem.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge

A. Adaptation of the Section 404 (b)(1) Guidelines to this Evaluation

The proposed project complies with the requirements set forth in the Environmental Protection Agency's guidelines for specification of discharge sites for fill material.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site, Which Would Have Less Adverse Impact on the Aquatic Ecosystem

Open water disposal sites were considered too costly and or environmentally damaging. The action, as proposed, is the least environmentally damaging practicable alternative after taking into consideration cost, existing technology, and logistics in light of the overall project purpose.

C. Compliance with Applicable State Water Quality Standards

The proposed project is not expected to negatively affect water quality related to water supplies, recreation, or fish and shellfish propagation. Overall, the project would comply with State of Alaska water quality standards (18 AAC 070).

D. Compliance with Applicable Toxic Effluent Standards or Prohibition Under Section 307 of the Clean Water Act

No open water disposal of dredge material is proposed and no toxic effluents that would affect water quality parameters are associated with the proposed project. Therefore, the project complies with toxic effluent standards of Section 307 of the Clean Water Act.

E. Compliance with Endangered Species Act of 1973

Dredging and fill activities would not affect over-wintering Steller's eiders, Steller sea lions, and possibly sea otters. The project as proposed would be in compliance with the Endangered Species Act.

F. Compliance with specified protection measures for marine sanctuaries designated by the Marine Protection Research and Sanctuaries Act of 1972.

No sanctuaries as designated by the Marine Protection Research and Sanctuaries Act of 1972 would be affected by this project. Minor quantities of effluent meeting State water quality standards might be introduced into the Kachemak Bay Critical Habitat Area, which is a State-designated critical habitat area.

G. Evaluation of Extent of Degradation of the Waters of the United States

There are no municipal or private water supplies in the area that could be negatively affected by the project. No significant long-term degradation of water-dependent habitat for plankton, fish, shellfish, or wildlife is expected to occur.

H. Appropriate and Practicable Steps taken to Minimize Potential Adverse Impacts of Discharge on the Aquatic Ecosystem.

Dredging hours were balanced with retention of discharge in the CDF to provide effluent, if any, that would meet or exceed the State Water Quality Standard of 25 NTU.

I. Compliance of the Proposed Disposal Site for the Discharge of Dredged Material.

On the basis of the Guidelines, the north dewatering site considered for discharge and disposal of dredge or fill material is in compliance with Section 404(b)(1) guidelines, with the inclusion of appropriate measures/actions to minimize pollution or adverse effects on the aquatic environment.