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DRAFT COORDINATION ACT REPORT
FOR
NAVIGATION IMPROVEMENTS,
DELONG MOUNTAIN TERMINAL, ALASKA

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Fairbanks Fish and Wildlife Field Office
101 12th Avenue, Room 110

January 19, 2005

Mr. Guy R. McConnell, Chief
Environmental Resources Section
U. S. Army Engineer District, Alaska
Anchorage, AK 99506-0898

Dear Mr. McConnell:

Attached please find a final draft copy of the Fish and Wildlife Coordination Act Report for the DeLong Mountain Terminal Deep Draft Navigation Improvements Project. If you have any questions or require additional information please contact Louise Smith at (907) 456-0306 or me at (907) 456-0324.

Sincerely,

Larry K. Bright
Branch Chief, Project Planning

DELONG MOUNTAIN TERMINAL DEEP DRAFT NAVIGATION IMPROVEMENTS PROJECT

Draft
Fish and Wildlife Coordination Act Report

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January 2005

SUMMARY

This report constitutes the U. S. Fish and Wildlife Service final Fish and Wildlife Coordination Act Report on the U. S. Army Corps of Engineers' proposed deep draft navigation improvements at the DeLong Mountain Terminal (DMT) Port Site. The purpose of the report is to provide the Corps of Engineers with information regarding fish and wildlife resources and to identify the potentially significant impacts to these resources associated with the proposed improvements to the DMT port site.

This report is prepared in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.). This document constitutes the draft report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act.

The following report is based upon information provided by the Corps of Engineers, a literature review, an assessment of potential impacts to fish and wildlife resources, and a site visit conducted in the fall of 2000. The Service believes proposed improvements to the DMT port site can be realized with minimal impacts to fish and wildlife resources through the implementation of Alternatives 1, 2, or 4. However, if Alternative 3 is selected and developed, unavoidable impacts to the benthic community will likely result. Alternative 3 also poses a threat to birds migrating along the coast in the vicinity of the DMT port site. The potential impacts to migrating birds may be mitigated, in part, through the implementation of proposed recommendations included in this report, and the impacts to the benthic community should be temporary.

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INTRODUCTION

The Red Dog Mine, located in the DeLong Mountains approximately 84 miles north of Kotzebue, is the largest zinc mine in the world. The mine, owned and operated by Teck Cominco Alaska, is located on land owned by NANA Corporation in the Northwest Arctic Borough. The Alaska Industrial Development and Export Authority (AIDEA) owns the DeLong Mountain Terminal (DMT), also known as the port site, and the road connecting the mine with the DMT. AIDEA contracts the operations at the DMT to Teck Cominco.

An environmental impact statement (EIS) was prepared by the Environmental Protection Agency (EPA) in 1984, prior to the construction of the mine. The existing facilities at the Red Dog Mine Site and Port Site were constructed in 1987-1988. Operations at the mine commenced in 1989 with the first shipments of ore from the port site in 1990. Teck Cominco operates the mine year round with an annual production of 1.1 million tons and 177,000 tons of zinc and lead concentrate, respectively. Concentrate is hauled from the mine site in 150-ton trucks via the 52-mile long road to the DMT located on the Chukchi Sea where it is stored in two concentrate storage facilities. The concentrate is stored at the DMT until early to mid-July, when the marine ice pack has dissipated and the shipping season commences. Concentrate is loaded on to barges via a conveyor system and barged approximately 3 miles offshore to bulk carriers where it is loaded and shipped to markets outside Alaska. During the shipping season the barge lightering system operates 24 hours a day until the storage facilities are empty and thereafter on an on-demand basis, determined by production at the mine site until ice conditions close the Bering Straits, usually by October or early November.

In 1998, the U. S. Army Corps of Engineers (Corps) began conducting environmental studies offshore of the existing port site to address the feasibility for deep draft navigation improvements at the DMT. The Corps conducted scoping meetings in 2000 and is currently preparing a draft EIS for public review. The Corps has identified 1 preferred and 3 alternatives to implement improvements at the DMT. Formal project coordination between the Corps and the U.S. Fish and Wildlife Service (Service) was initiated during the spring of 2000. In summer and fall of 2000, a Service biologist traveled to the port site to conduct a site investigation. This Fish and Wildlife Coordination Act Report summarizes the results of the biological investigation, discusses the fish and wildlife resources in the project area, and assesses the potential impacts to these resources of the proposed alternatives for the deep draft navigation improvements at the DMT.

PLAN DESCRIPTION

The DMT currently is composed of two concentrate storage facilities, three barge berths, fuel storage, accommodations for personnel, and a dock with covered conveyor system. The dock is approximately 700 feet long extending out to an approximate 20 foot water depth, with vessel draft limited to 15-17 feet. The dock is a trestle-style construction, with the base situated approximately 30 feet above the water. The top of the covered conveyor system is approximately 80 feet above the water.

Alternative 1 No Action Alternative

Under this alternative, the port facility would remain as it is currently configured. Operations would continue with the existing two 5,550 dwt self-discharging lightering barges, barge loader, dock and loading trestle, and four tugs. Ore would continue to be loaded onto tug-assisted barges and lightered to container ships anchored approximately three miles offshore. The shipping season and production levels would continue to be determined by weather and ice conditions in the Chukchi Sea.

Alternative 2 - Third Barge Alternative

The third barge alternative would add an additional lightering barge and one or two tugs to the fleet currently in use at the DMT. The barge loader at the end of the dock is idle while the two existing tugs are in transit or are offloading concentrate. The additional barge would allow all the stored ore concentrate to be shipped, something that does not happen consistently every year because of weather delays. This alternative is considered a no-structure alternative as it involves no modifications to the existing dock structure. An additional mooring buoy would be placed offshore. The mooring buoys currently in use at the DMT are placed seasonally, during open water, approximately ½ mile offshore in 30 feet of water. The third mooring buoy will be positioned a similar distance from shore either north or south of the current buoy positions.

Alternative 3 - Breakwater and Fuel Transfer Alternative

The breakwater alternative would allow for the construction of a breakwater offshore of the existing trestle dock. The breakwater would protect the barge loader and the dock from wind and waves that interrupts loading and dock operations, thereby increasing the efficiency of the dock. In 2000, 19 weather-related delays were reported, lasting an average of 41 hours each. It is anticipated that a breakwater would decrease the occurrence of weather-related delays by about 75 %. Barges would continue to lighter concentrate to ships anchored three miles offshore.

The breakwater would be constructed at the 24-foot depth contour about 650 ft offshore. The breakwater wall would be approximately 200 ft by 2,800 ft (13 acres) and would extend approximately +10 ft above Mean Lower Low Water (MLLW). Armored-rock construction would be used for the breakwater, with construction materials being barged from Nome, where there are quarries with sufficient quality and quantities of rock. An estimated 370,000 cy of material would be needed to construct the breakwater. The construction would take approximately three years, from June through September or October each year.

This alternative would construct and operate a new onshore pumping station and a pipeline running from the pumping station offshore 11,000 feet to a mooring area for ocean going tankers in water at least 43 feet deep at MLLW. The 20-inch diameter, ¼-inch thick steel pipeline would be in a horizontal directionally drilled tunnel for the first 2,500 feet to minimize beach disturbance and effects on the lagoon just shoreward of the beach. It would be buried in a cut-and-cover trench for the remaining distance to the offshore terminal. Tankers bringing fuel to Portsite would tie off to mooring buoys, raise a flexible pipe from the bottom, and connect it to the ship's fuel discharge manifold. The fuel would then be pumped to the Portsite DMT fuel storage tanks. When the tanker was unloaded, the ship would return the flexible pipe to the ocean floor. At the end of each season the pipe would be pigged and filled with inert gas to avoid any fuel spillage if ruptured during the off-season. The flexible pipe and buoys also would be removed at the end of each shipping season and reinstalled at the beginning of the next shipping season.

Alternative 4 - Trestle-channel Alternative

The trestle-channel alternative is the most complex of the alternatives and would require considerable engineering design and construction. A new trestle bridge and loading platform would be built to the north of the existing dock, thereby allowing for construction and continued operations at the barge loading facility. In addition, a deep-draft channel would be dredged to the new loading facility. Once complete, the new loading platform would allow for concentrate to be loaded directly into ships, eliminating the need for the lightering barges.

The trestle would be constructed using a series of cell and pile structures. The trestle would extend seaward 1,450 ft from an abutment on shore and would be 35 feet above MLLW. The trestle would support a conveyor system, a road, a fuel-transfer line, and utilities from shore to the loading platform. At the seaward end of the trestle a 90-foot by 300-foot loading platform would be built to support one or two cranes and two radial ship-loaders, a conveyor tower, hydraulic/MCC rooms, and fuel unloading equipment.

A deep draft channel with a turning basin would need to be dredged from about the -20-ft depth contour seaward to the -53-ft depth contour. The channel would extend for approximately 19,700 ft and would be 500 ft at its narrowest and 1,600 ft at its widest. An estimated 8,100,000 cy of material would be removed to construct the channel and basin. The estimated footprint would be 345 acres increasing to 414 acres over time due to slumping. Maintenance dredging of approximately 1.1 to 1.2 million cy of sediment would have to occur at 5,17,33 and 49year intervals to maintain a 53 ft draft depth. All dredging would take place during the open water season.

The trestle would be a through-type truss construction approximately 30 feet deep and 20 feet wide center-to-center of the trusses, providing a 22-foot high by 18-foot wide roadway within the structure for the passage of light trucks and maintenance equipment. A conveyor gallery approximately 8-foot high by 10-foot wide would be enclosed at the top of the structure. The trestle structure would be supported by a conical pier foundation.

The trestle-channel alternative also would support a 12-inch diameter fuel pipeline, allowing for direct discharge of fuel (up to13 million gallons) from tankers to the DMT port site. Currently, fuel is discharged from shallow-draft barges with a capacity of no more than 4 million gallons. Expected annual fuel deliveries at the DMT port site would provide approximately 52.25 million gallons of fuel which would be stored at the port site tank farm. Approximately 30 million gallons of fuel would be available to be shipped to Northwest Arctic villages in shallow-draft tug and barge services.

The dredging of the channel and the deep-draft turning basin would be accomplished using one of, or a combination of, three dredges: a trailing suction hopper dredge; a hydraulic pipeline cutterhead; and a mechanical clamshell dredge. Each of the dredges have limitations according to the nature of the substrate and the depth of the water. All of the dredges will result in an increase in turbidity within the marine environment.

FISH AND WILDLIFE RESOURCES

Fish

Major streams in the vicinity of the DMT port site include the Asikpak, Kivalina, Wulik, and the Omikviorok rivers, and Rabbit Creek. The Noatak River flows into Kotzebue Sound, south of the DMT port site. All of these rivers support anadromous fish. The primary anadromous fish species in the area is the Dolly Varden char. Other major anadromous or semi-anadromous fish species occurring in the riverine systems include pink, chum, coho, sockeye and king salmon, slimy sculpin, round whitefish, humpback whitefish, least and Bering cisco, and Alaska blackfish.

<u>Dolly Varden Char</u>

Dolly Varden char are found in the waters of the DMT port site and are an important subsistence fishery in Kivalina. In Alaska, these char are considered to be a coastal species and range along the Beaufort Sea coast from the Canada border through the Chukchi and Bering seas to the Alaska Peninsula The waters of the Chukchi Sea and Kotzebue Sound produce the largest Dolly Varden in North America and perhaps the world. The Kivalina, Wulik, and Noatak rivers, which empty into the Chukchi Sea and Kotzebue Sound, provide important spawning, rearing and overwintering areas for Dolly Varden (DeCicco 1985).

The char of the Chukchi Sea and Kotzebue Sound areas have rather complex movement patterns throughout the year (DeCicco 1990). Summer spawning char remain in freshwater in spring and summer, spawn in late July through late August, overwinter in the spawning streams and move to the marine environment the following spring. Fall spawners move into the marine environment in the spring, return to fresh water to spawn in September and October and overwinter in the spawning streams (DeCicco1990, 1996). Juvenile char remain in the natal rivers for two to four years before entering the marine environment.

Although considered a coastal species, Dolly Varden char have been known to travel long distances in the Chukchi Sea. Fish tagged in the Wulik River have been recovered in Norton Sound, near Savoonga on Saint Lawrence Island, and 540 km upstream in the Anadyr River (DeCicco 1990). It is not known if these char were from populations that originated in the Wulik River and traveled to the Bering Sea to feed, or if they were from Bering Sea or Russian stocks that had fed in the Chukchi during the previous summer.

Salmon

Five species of salmon (*Oncorhynchus sp.*) are known to spawn in rivers surrounding the DMT port site. The Wulik River system supports small populations of all five species, but most notably chum salmon, while the Kivalina River supports chum and pink salmon. Pink Salmon are the most abundant salmon species in the area. Chum and pink salmon smolt spend little time in fresh water, moving to the marine environment almost immediately after hatch. Chinook, coho, and sockeye salmon may spend up to three years in fresh water before moving to sea.

In addition to Arctic char and all of the salmon species, Bering cisco, humpback whitefish, and Arctic grayling are found in the marine waters surrounding the DMT port site.

Birds

Use of the DMT area by breeding birds has been well documented in the literature. Inland and coastal areas near the port site provide nesting habitat for numerous species of passerines, shorebirds, and a few species of waterfowl. Intensive breeding bird studies of the area were conducted for the original EIS (Dames and Moore 1983). Shorebird studies also have been conducted in the coastal areas of Cape Krusenstern National Monument (Gill et al. 1996). Extensive species lists also have been compiled for areas adjacent to Red Dog including Cape Krusenstern National Monument, Kobuk Valley National Park, and Noatak National Preserve.

Although the breeding bird use of the DMT area has been well documented, the use of the area by migratory birds is less well studied. The Chukchi Sea coast is a primary migration route for thousands of birds during spring and fall migration, although specific routes used during spring and fall are not well documented. Waterfowl and shorebirds comprise the majority of the birds moving along the coast during migration. During spring migration in the Arctic, waterfowl tend to fly over the ice or follow the lead that forms each year between the shore fast and pack ice (Johnson and Richardson 1980). During fall migration, migration routes are more varied, with some species following the coastline closely and others traveling further offshore. Weather conditions can affect migration routes, however. For example, during strong northerly and easterly winds in spring, flocks of waterfowl were noted to fly low along the coastline, presumably to conserve energy. Strong southerly winds during spring migration also can blow birds inland toward the beach. Flocks of Canada geese, swans and some ducks also have been observed migrating inland from the coast in the DMT port site area during both spring and fall migration. Generally, northward movements of birds in the spring along the Chukchi Sea coast occurs in two pulses, from May through mid-June and mid-June to mid-July. The first movement consists of birds flying north to breeding grounds on the Arctic Coastal Plain and the second pulse of birds consists of birds (mainly waterfowl) flying north to molting areas (Lehnhausen and Quinlan 1981). Fall migration is thought to begin in late July and extends into late September (Lenhausen and. Quinlan 1981).

Threatened and Endangered Species

The DMT is within the range of the threatened spectacled eider (*Somateria fischeri*) and Steller's eider (*Polysticta stelleri*). Spectacled eiders and the Alaska breeding population of Steller's eiders were listed as threatened under the Endangered Species Act of 1973, as amended, in 1994 and 1997, respectively.

<u>Spectacled Eider</u>

Spectacled eiders breed in western and northern Alaska and in Arctic Russia. The western population in Alaska, which nests in coastal habitats on the Yukon-Kuskokwim delta, has declined approximately 90% from 1957 to 1992 (Stehn et al. 1993). The northern Alaska population, which nests coastally from Demarcation Point to Wainwright, also is thought to be declining, although data are inconclusive (Petersen et al. 2000). The population status of breeding Spectacled eiders in Russia is unknown.

Spectacled eiders molt in near-shore waters of the Arctic Ocean, and Chukchi and Bering seas (Petersen et al. 1995, 1999). In Alaska, spectacled eiders molt in eastern Norton Sound (western population) and in Ledyard Bay (northern population). Some Alaska breeding birds molt in Mechigmenskiy Bay in the western Bering Sea and off the eastern tip of St. Lawrence Island. The winter range of the Spectacled eider is restricted to open leads and small polynyas in the pack ice south of St. Lawrence Island in the Bering Sea (Larned and Tiplady 1999).

The timing of spring migration of Spectacled eiders from wintering areas in the Bering Sea is somewhat dependent upon the availability of leads in the Bering and Chukchi seas (Dau and Kistchinski 1977). Spectacled eiders migrating along the Chukchi and Beaufort sea coast arrive at northern breeding grounds in late May and early June (Johnson and Herter 1989). Spring migration of eiders at Icy Cape was observed from late May through early June in 1980 (Lehnhausen and Quinlan 1981).

Molt migration from northern breeding areas to Ledyard Bay occurs in late June for males and mid-July for failed-breeding females (Petersen et al. 1995, 1999). Successful females and young leave breeding grounds in late August and arrive at molting areas 10 to 20 days later. Migration routes from breeding areas to molting areas occur between 15 to 30 km offshore, depending upon the location (Peterson et al. 1999). Departure dates from molting areas to wintering grounds are highly variable with males and failed breeding females departing in early October and successful females in late October and early November (Petersen et al. 1999).

Steller's Eider

Steller's eiders nest in coastal tundra areas of the Alaska arctic coastal plain and arctic Russia. The main nesting area occurs along the coast of northeastern Russia. In Alaska, Steller's eiders historically nested discontinuously from the Aleutian Islands to the Seward Peninsula, including the Yukon-Kuskokwim delta, from the vicinity of Point Lay to Point Barrow, and east of Point Barrow along the Arctic Coastal Plain to the United States-Canada border (Kertell 1991, Kessel 1989). The only confirmed area in Alaska where Steller's eiders currently are known to nest regularly (but not annually) is located in the vicinity of Point Barrow (Quakenbush and Cochrane 1993).

Most of the world's population of Steller's eiders, estimated at 150,000 to 200,000, molt in Izembek and Nelson lagoons on the Alaska Peninsula and winters in protected marine waters of the eastern Aleutian Islands, the Alaska Peninsula and Southcentral Alaska (Larned 2003). Steller's eiders migrate in spring and fall over the Bering, Chukchi and Beaufort seas, following coastlines and barrier islands, and may use coastal habitats to feed and rest (Gill et al. 1978). Migration routes of Steller's eiders to and from the breeding grounds in northern Alaska are not well-documented. It is assumed that eiders follow leads in the ice along the Chukchi sea coast during spring migration. During migration observations at Icy Cape in 1980, Steller's eiders were seen uncommonly in flight. A few Steller's eiders, however, were seen in salt marsh habitat along the mainland and barrier islands in late June and late July, indicating some limited use of coastal habitats during post-breeding migration (Lehnhausen and Quinlan 1981).

Marine Mammals

Polar Bears

Polar Bears are circumpolar in distribution and are comprised of several stocks based on phylogenetics and geographic separation (Harrington 1968, Dizon et al. 1992, Amstrup 1995). In Alaska, polar bears are divided into two stocks, the Southern Beaufort Sea stock and the Chukchi/Bering Seas stock. The ranges of these two stocks overlap in the northeastern Chukchi Sea between Point Hope and Point Barrow (Garner et al. 1994, Amstrup 1995). Polar bears that occur in the vicinity of the DMT port site are from the Chukchi/Bering Seas stock.

Non-denning bears from the Chukchi/Bering Seas stock overwinter in the northern Bering Sea as far south as Saint Mathew Island or along the southeastern Chukchi seacoast where concentrations of marine mammal carcasses are found (Kalxdorff 1997, 1998). They can make extensive north-south movements throughout the Chukchi Sea, depending upon ice condition and availability of food. In the spring, the bears follow the receding ice pack north and spend the summer along the ice-edge, usually north of 72 o North, feeding on ringed seals. Most pregnant females from the Chukchi/Bering Seas stock den on land on Wrangell Island or along the coast from Point Hope to Point Barrow. Some females also den in the pack ice offshore of Point Barrow (Kalxdorff 1997).

Although polar bears are not known to den on land in the vicinity of the DMT port site, villagers from Kivalina have reported polar bear den sites on the offshore pack ice (Kalxdorff 1997).

<u>Pacific Walrus</u>
Pacific walrus range throughout the continental shelf waters of the Bering and Chukchi seas. During winter the walruses are found in two distinct areas of the Bering Sea where persistent polynyas occur (Fay et al. 1984). While the location of these groups shift somewhat from year to year depending upon the ice conditions and location of the polynyas, one is usually found in an area extending from the Gulf of Anadyr to an area southwest of St. Lawrence Island, and the other south of Nunivak Island in the southeastern Bering Sea or northern portion of Bristol Bay. In spring, females and juveniles move north to St. Lawrence Island where they feed, before moving north through the Bering Strait and into the Chukchi Sea. They spend the summer along the edge of the pack ice. Bull walruses remain in the Bering Sea for the summer, with the majority using Round Island in Bristol Bay as a haulout. The bulls typically move north in the fall, meeting the females and juveniles north of St. Lawrence Island as they move south along the advancing ice pack.

Walruses are not typically seen near the DMT port site or Kivalina. They usually migrate 30 to 40 miles offshore of the southeastern Chukchi Sea coast in spring as they follow the pack ice north and spend the summer near the edge of the ice pack in the northern Chukchi Sea. Fall migration routes are similar to spring, again moving with the advancing pack ice well offshore of the southeastern Chukchi seacoast.

IMPACTS ASSOCIATED WITH ALTERNATIVES

All of the alternatives, including the no action alternative, will produce varying levels of noise, both above and beneath the water, during construction and operations at the port site. The impacts to wildlife associated with noise levels are difficult to assess, however, because water is a much more efficient transmitter of sound than is air, it is likely that the marine environment potentially could be the most affected by an increase in noise levels associated with construction, maintenance, and operation activities at the port site. In the following discussion noise levels are reported in decibels (dB) at 1 m and 100 m distances from the source.

Alternative 1 No Action Alternative

The no action alternative would produce no additional impacts than are currently associated with ongoing operations of the port site. Underwater noise is produced at the port site primarily during the loading and lightering of concentrate with noise emanating from the propellers on the tugs as they move the loading barges. The deep-draft ore ships also produce noise as they move into and out of the area. In 2000, underwater noise levels were monitored at the port site. The deep-draft freight ships produced the loudest underwater noise levels (186dB at l m and 148 dB at 100 m) recorded during the survey and were detectable up to 20 miles from the source. Although about 20 freighters arrive and depart from the port site each year, the noise they produce is temporary, as they are entering and leaving the area. Tug boats were found to produce the most regularly-occurring underwater noise (dB at 1 m and dB at 100 m) at the port site. Because the noise from the tugs is produced at low frequencies, however, it would be detectable for up to 6 miles directly offshore from the source and somewhat shorter distances along shore. Except during periods of inclement weather, the tugs are operating almost continuously during the open water season from July through September.

Impacts to fish and wildlife resources associated with underwater noise at the port site are difficult to assess. Underwater noise deterrents used to detract marine mammals (sea lions) away from migrating salmon in the Columbia River basin do not appear to have an impact on fish movements. In addition, noise associated with the most persistent source at the DMT (tug boats), is probably not loud enough to impact fish movements within or offshore of the major estuaries to the north and south of the DMT port site (Bill Morris, ADNR, pers. comm.). Recent studies regarding the effects of noise on the sensory hairs of the ears of several fish species, however, have shown that severe damage can occur at frequencies in excess of 180 dB (McCauley et al. 2002).

The dock and loading facility as it is presently designed probably poses some risk to migratory birds. The dock extends approximately 700 feet offshore and is raised approximately 65 feet above MLLW. The top of the covered conveyor system is approximately 80 feet above MLLW. Although no collisions of birds with the facility were seen during observations made during fall migration in 2000, it is conceivable that birds may hit the covered conveyor system or the loading superstructure during periods of inclement weather. Collisions by birds with structures along the coast associated with the Prudhoe Bay oilfields, such as the saltwater Treatment Plant and buildings at the Endicott Development, have been documented during periods of fog (Day et al. 2003).

Alternative 2- Third Barge Alternative

The third barge alternative would add one lightering barge and one or two tugs to the operation at the port site. The increased impacts to fish and wildlife probably would be minimal with this alternative. Additional noise levels associated with similar vessels would increase the overall noise level logarithmically. For example, if one tug were operating at 140 dB, an additional tug operating at the same dB level would increase the overall noise level to 143 dB. Nine additional tugs would increase the level to150 dB. Tugs currently operate continuously during the open water season and the increased noise associated with one or two tugs would not add significantly to the underwater noise levels produced by current operations at the port site. The third barge alternative would not involve additional work to the dock or the loading facility, and therefore would not increase the risk to migrating birds.

Alternative 3 - Breakwater and Fuel Transfer Alternative

Impacts to fish and wildlife resources with the breakwater alternative would involve increased noise levels of varying intensity and duration associated with construction of the breakwater. Sources of the noise likely would be from barges, cranes, skip-boxes, loaders, and tugs. As discussed in Alternative 1, additional tugs operating in the area would result in a logarithmic increase in noise. Construction of the breakwater would occur during the open water season for three years. As the breakwater would extend only +10 feet above MLLW and would run parallel to the shore, it would pose minimal risk to migratory birds.

Impacts to fish and wildlife resources associated with the fuel transfer pipeline would involve increased noise levels of varying intensity and duration and siltation associated with construction of the mooring facility and burial of the pipeline. Sources of the noise likely would be from barges, cranes, skip-boxes, loaders, tugs, and dredges. The mooring facility likely would have little direct impact to fish and wildlife resources in the area. The platform would range from 0 to 20 feet above MML and 20 to 25 feet in diameter, depending upon the selected design, and would pose little collision threat to migrating birds. The biggest threat to fish and wildlife in the vicinity of the mooring platform would be those associated with a spill during loading or off-loading of fuel. Strict standards for determining safe conditions for fuel transfer (wind direction/speed, sea state, and currents) would help reduce the risk of major fuel spills at the mooring facility. Spill response equipment should be stored at the DMT port site and oil retention booms and skimmers should be deployed during fueling operations. The surface of the seabed along the buried portion of the line should be visually inspected each year post breakup to determine if ice scour has compromised the pipeline. A state-of-the-art leak detection system also should be installed to determine if the line develops leaks associated with corrosion.

Alternative 4 - Trestle and Channel Alternative

The trestle and channel alternative would pose the greatest impacts to fish and wildlife resources in the vicinity of the port site. Impacts likely to occur during the construction phase of the trestle and dock include: increased noise from vessel traffic, boring machines and pile-driving and vibratory hammers used for pier construction, and dredging equipment used for channel excavation; increased siltation of marine waters from channel excavation; direct loss of benthic habitat from dumping of dredge materials; and increased risk of collision for migratory birds from the dock and superstructure. Construction activities would generally take place from July through September for approximately 3 years. Construction of the nearshore cell supports would occur from ice pads during February and March of one year. Post-construction impacts associated with the trestle-channel alternative include noise from an increase in deep-draft ships and maintenance dredging operations; siltation and direct habitat loss from maintenance dredging operations; and continued risk of collision for migratory birds from the dock and superstructure.

Noise

Increased underwater noise would result from several sources during the construction phase of the trestle/dock and navigation channel. The most persistent noise will likely emanate from vessel traffic and would vary according to the type of vessel. As stated above, tugs produce low-level, low-frequency noise which attenuates rapidly in the shallow waters surrounding the port site. Dredging operations would produce varying noise levels (~120 dB to ~170 dB) depending upon the type of dredge used and the mode of operation. Most dredges operate within the lower frequency ranges and therefore would be detectible underwater for distances between 6 to about 15 miles from the source, depending upon the turbidity of the water, substrate sediments, and slope of the ocean floor.

Although most studies of underwater noise have concentrated on the impacts to marine mammals (e.g., NRC 1994; Richardson et al. 1995), there is increased concern regarding the impact to marine fishes. Very high-intensity pure tones (e.g., > 180 dB re 1 uPa) presented for several hours may cause damage to the sensory hair cells of the ears of several fish species (Hastings et al. 1996; McCauley et al. 2003). Other studies have found some sounds will alter the behavior of marine fishes (Engas et al. 1996; Popper and Carlson 1998). Video monitoring of several species of fish have shown, however, that most species, when encountering high-level noise, will actively avoid the source if at all possible (Engas et al. 1996). While some temporary behavioral impacts (e.g., avoidance) by anadromous fish in the immediate vicinity of the DMT port site may occur as a result of noise generated by construction, maintenance, and operations, the long-term implications are probably minimal. The DMT port site is located approximately 15 to 20 miles south of the mouths of the Wulik and Kivalina rivers, respectively. Because of the distance of the port site from the lagoon systems associated with the Wulik and Kivalina rivers, fish associated with these systems likely will not be negatively affected by underwater noise at the port site.

Siltation and Offshore Disposal

Considering all the potential impacts associated with an expanded DMT port site, siltation of the water column from dredging operations potentially could have the most serious impact on the marine environment. The Alaska Coastal Current runs northward through the Bering Strait to the Chukchi Sea and is the dominant current along the shore at the DMT port site, however, wind, waves, and ice conditions can temporarily alter (and reverse) the localized alongshore currents (PN&D 1999). The coastal area of this portion of the Chukchi Sea is ice-covered for much of the year (November - June) and because of the shallow water depths and the gradual nature of the slope of the sea floor (< 1% slope) the ice packs may be anchored by ice keels. Ice-gouges in the sea floor occur offshore throughout the vicinity of the DMT to at least the 70 foot isobath. The sediment in this portion of the Chukchi Sea is characterized as silty fine to coarse sand and gravel (Dames and Moore 1983). The shallowness of the sea floor, the silty nature of the substrate, and strong near-bottom currents produce a dynamic benthic environment that is frequently disturbed by winter ice gouging and summer storms.

The benthic faunal community in the DMT port site area is comprised of species able to tolerate high-energy, dynamic conditions (e.g., the polychaete worm Myriochele oculata and the brittle star Amphiuridae) and known colonizers of disturbed sediments (e.g., polychaetes of the families Capitellidae, Cirratulidae, and Spionidae). However, it is not known what impact the siltation caused by dredging will have on the infaunal community. Since the amount of suspended sediments released into the water column is dependent upon the type of dredge used and the environmental conditions at the time of dredging (e.g., wind direction and speed) it is impossible to predict how far and heavily the plume will disperse over the ocean floor. Heavy sedimentation will likely kill epibenthic invertebrates such as crab and sea stars and may impact the infaunal community as well. Since dredging will occur during the ice-free season, the benthos will have the winter months to recover, however, it is not known how long recovery would take. It is unlikely that sedimentation will reach into the lagoon systems of the Kivalina and Wulik rivers, or that it will affect anadromous fish moving in and out of those systems.

Migratory Bird Collisions

The proposed dock, covered conveyor system, and the loading superstructure at the DMT port site will pose a significant hazard to migrating birds. Collisions by migrating birds into man-made structures have been well documented in the literature. Weather conditions such as storms associated with rain, snow, or icing and fog or low clouds at the time of the occurrences are often attributed as causal factors (Brown 1993). Lighting of structures, which can be intensified by fog or rain, also has been identified as a factor (Avery et al. 1980, Brown 1993, Jehl 1993). Birds are attracted to the lights, become disoriented, and collide with the structure. Although passerines, which usually migrate at night, are particularly at risk, other non-passerine species also are susceptible to collisions (Telfer et al. 1987, Jehl 1993). Lights on fishing vessels at sea have been known to attract large numbers of seabirds during storms (Dick and Donaldson 1978). Waterfowl and shorebirds also have been documented as colliding with lighted structures and boats at sea (Schorger 1952, Anderson 1978, Day et al. 2003).

The proposed dock at the DMT port site would extend seaward for approximately 1,800 feet (~ 1/3 mile) and rise at its highest point approximately 80 feet above MLL water. Lighting of the structure will be an extremely important component in determining the risk to migratory birds. Spring migration along this section of the Chukchi coast occurs from May through late June and early July and is usually concentrated offshore, in open leads which occur between the shore fast and pack ice (Johnson and Richardson 1980). Because daylight extends for almost 24 hours during this time of year, and because the port facility will not be in operation until the latter part of spring migration, lighting of the structure may not be necessary during this time. Although periods of heavy fog and spring storms are not uncommon, the increasing daylight and the fact that many of the birds will be migrating offshore of the dock, may decrease the overall risk of collision for migratory birds during spring migration. This is not to say that episodic events will not occur. During spring migration watches in 2000, strong south to southwest winds brought migrating seaducks in close to shore. Flocks of Steller's eiders (4 flocks, 50 birds total) were seen flying near the shiploader during one such weather event (DMT 2002).

Fall migration at the DMT port site occurs from late July through late September and early October, during which time the dock and shiploader will be in use 24 hours a day. It is also a time of decreasing daylight and increasing storms. Fall migration routes are also more variable and cover a wider area than in spring. The combination of these factors could increase the risk of bird collisions at the dock significantly. Any lighting of the structure would have to be carefully analyzed and configured to reduce attraction to the facility by birds during inclement weather and periods of darkness. An ongoing study of lighting design and the avoidance of migrating birds at the Northstar production island in the Beaufort Sea has not produced any definitive results (Day et al. 2003). Another compounding factor is the probability that should collisions occur, the event would not be documented owing to the likelihood that all specimens would be lost in the ocean. A design feature of the dock could include a catwalk or net along the length of both sides of the dock that would retain any birds which collided with the structure, thereby allowing an assessment of the impacts to migrating birds.

Seaducks, including loons, are particularly vulnerable to collisions with structures such as the proposed dock, primarily because they tend to fly low over the water. Observations of eiders during molt migrations along the Beaufort Sea coast documented that 88% of the birds flew below an estimated 10 m (32 feet) and over 50% flew below 5 m (10 feet) (Johnson and Richardson 1982). Migrating seaducks could conceivably pass through the piers supporting the dock, however, depending upon the selected design for the piers, they alone could pose a significant risk to migrating birds.

DISCUSSION

All of the alternatives described in the DMT port site DEIS would potentially impact fish and wildlife resources in the area. However, alternatives 1 (No Action Alternative) and 2 (Third Barge Alternative) would have considerably fewer potential fish and wildlife impacts than Alternative 3 (Breakwater and Fuel Transfer Alternative) and Alternative 4 (Trestle-Channel Alternative). The impacts associated with Alternative 2 would primarily be associated with additional noise from tugboats and one additional lightering barge. The Service believes the potential impact to fish and wildife resources associated with the implementation of Alternatives 1 and 2 to be minimal and ephemeral. Alternative 3 also would have minimal impacts associated with noise and siltation due to one-time dredging activities during construction phases. However, Alternative 3 also could impact fish and wildlife resources through oil spills at the fuel transfer facility. The impacts to fish and wildlife resources associated with oil spills could range from mortality through direct oiling, to chronic impacts such as deformities and reduced reproductive potential associated with low-level and persistent pollution.

Alternative 4, however, potentially could have the most significant impacts to fish and wildlife in the port site area. Some of the impacts to migratory birds associated with this alternative may be mitigated and monitored through systematic testing of lighting schemes used on the dock and superstructure, as well as careful attention to the design of the structure itself. However, impacts to the benthic environment associated with periodic channel dredging over a 50-year period likely could not be avoided, resulting in periodic mortality of epibenthic invertebrates such as crab and sea stars. Due to a natural and regular rate of disturbance in this community (e.g., storms and ice gouging), the Service does not expect these impacts to be permanent.

RECOMMENDATIONS

The following recommendations refer to Alternatives 3 and 4 that potentially could have the most significant impacts to migrating birds. Included in these recommendations are suggestions for structural modifications and monitoring post-construction to determine impacts to migrating birds.

1. A detailed description of the lighting design for the structure should be developed, including the types of lights proposed and the timing of their use, and reviewed by resource agencies. The Service recommends that most lighting along the covered conveyor system and road be internal with only lighting necessary for safety located on the outside of the structure. The use of lights at the seaward end (work area) of the dock should be kept to the minimum necessary for safe working conditions. All lights should be shielded (directed downward).

2. A mechanism to contain birds that strike the dock should be designed and installed along the length of the dock on both sides. The system should be monitored daily for birds during fall and spring migration. Bird strikes should be reported to the Service, including the species, date, weather conditions, and location along the dock where the bird was recovered.

3. A radar study to monitor the movement of birds along the DMT port site during spring and fall migration should be conducted pre- and post construction of the dock. The study should examine the efficacy of the lighting system used on the dock, and the effects of changing the system, particularly if bird collisions become a problem. The study should be conducted for a minimum of 5 years post-construction, with annual updates and a final report provided to all interested parties.

4. Fuel spill containment, such as booms, should be utilized during the transfer of fuel. A state-of-the-art leak detection system should be installed with all fuel lines.

5. Required Operating Procedures should be established for the transfer of fuel at the port site, with particular regard to the proposed mooring facility. Standards should include the following: minimal weather and sea conditions when fuel transfer could occur; the number of personnel needed to attend transfer operations; and the type and amount of response and containment equipment, including vessels, needed on site. An oil spill response plan should be developed and approved by the Alaska Department of Environmental Conservation.

This report was prepared in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.), and constitutes the draft report of the Secretary of the Interior as required by Section 2b of the Act. This report provides equal consideration of fish and wildlife conservation in conjunction with the project purpose.

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