



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JUN 14 1993

OFFICE OF  
WATER

Honorable G. Edward Dickey  
Acting Assistant Secretary (Civil Works)  
Department of the Army  
Washington, DC 20310-0130

Dear Dr. Dickey:

In accordance with the provisions of the 1992 Memorandum of Agreement (MOA) between the U.S. Environmental Protection Agency (EPA) and the Department of the Army under Section 404(q) of the Clean Water Act (CWA), I am requesting your review of a permit decision by Colonel John W. Pierce, U.S. Army Corps of Engineers Alaska District. Colonel Pierce's decision would allow modification of an existing Section 404/Section 10 permit (Port Valdez 83) which the Alaska District issued to the City of Valdez, Alaska on January 24, 1980. The Department of the Army draft Permit Modification and draft Permit Evaluation and Decision Document prepared by the Alaska District were received by EPA Region 10 on May 10, 1993.

The proposed permit modification, which is the subject of this elevation, would authorize the installation of a pipeline on the Valdez Container Terminal causeway and terminal loading facility to transfer and dispense refined petroleum products, including jet fuel and marine diesel fuel, to barges for shipment elsewhere in Alaska. After a thorough review of available information, EPA has determined that the proposed permit modification would result in a substantial and unacceptable adverse impact to the Valdez Duck Flats, an aquatic resource of national importance, and that this case warrants elevation in accordance with the criteria in the MOA under Part IV, Elevation of Individual Permit Decisions. A detailed discussion of our determination is provided in Enclosure 1.

Aquatic Resources of National Importance

This referral meets the criteria in Part IV of the 1992 EPA/Army Section 404(q) MOA. EPA finds that the proposed modification of the Port Valdez 83 permit to authorize the delivery and transfer of refined petroleum products at the Valdez Container Terminal would result in substantial and unacceptable adverse effects to the Valdez Duck Flats (Duck Flats), an aquatic resource of national importance. EPA concurs with the findings of the Alaska District that the Duck Flats "is one of the most productive ecosystems within Port Valdez." The 1000 acre area exhibits a unique and

complex mosaic of vegetated communities, inter- and sub-tidal mud flats, submerged aquatic moss beds, scrub-shrub wetlands, forested islands with rocky shores, freshwater streams, subtidal ponds and 460 acres of salt marsh. This combination of aquatic systems comprises a fish and wildlife habitat type which is comparatively rare in the State of Alaska.

Due to the diversity of habitat type, abundant detrital production, and a rich plankton and invertebrate population, the Duck Flats provide a significant source of food and forage that, in combination with nesting, molting and staging habitat, attracts and supports large numbers of birds. The area supports a total of 22 species of waterfowl, 21 species of shorebirds/wading birds, 12 species of fishing birds, two species of raptors and 27 species of passerine and other birds. The area also provides feeding habitat and a haul out area for Harbor Seals and Stellar Sea Lions utilizing Port Valdez waters.

In addition to outstanding wildlife values, the Duck Flats provide significant habitat for a range of freshwater, marine and anadromous fish species including, most notably, six species of salmonid. A majority of the Port Valdez wild population of Pink and Chum salmon spawn in the numerous streams which flow through the Duck Flats area with the entire area serving as valuable nursery habitat for both the wild and hatchery populations of the salmon fry in eastern Port Valdez. It is estimated that the commercial salmonid populations supported by the Duck Flats area are valued at approximately \$2.3 million annually. The Duck Flats area and its adjacent estuary also support significant marine and freshwater fish populations which in turn support additional commercial and recreational fishing activities.

#### Adverse Environmental Impacts

Modification of the permit to authorize the delivery and transfer of refined petroleum products at the Valdez Container Terminal will result inevitably in chronic small scale spillage and leakage of refined petroleum products into the Duck Flats aquatic environment, despite proposed preventive and response mitigation requirements. That spills will inevitably occur is evidenced in recent Coast Guard data which shows that between 1988 and 1991, 723 oil spills were reported for the Prince William Sound area in which Port Valdez is located. Spills at the Valdez Container Terminal will have a significant long-term, cumulative adverse effect on the unique environmental values of the Valdez Duck Flats. Further, the proposed permit modification, notwithstanding the proposed preventive and response mitigation requirements, fails to effectively consider the substantial risk of a major spill event. While such an event would unavoidably result in significant adverse impacts to the aquatic environment of Valdez Harbor under any circumstances, the occurrence of a significant spill in the Duck Flats aquatic environment would have devastating short- and long-term consequences on the unique and valuable aquatic resources in the area.

It its permit decision documents, the District acknowledges the risk of spill events, but concludes that spill prevention and control measures will be sufficient to protect the Duck Flats from such impacts. The petroleum product loading scenario utilized by the Alaska District, however, to assess the risk of spills as well as the effectiveness of proposed mitigative measures, is contingent upon unrealistic assumptions regarding the capabilities to preclude spills from occurring and, if do they occur, to minimize their adverse effects. Based upon our experience regarding the prevention and remediation of spills of refined petroleum products, EPA remains concerned that the proposed spill prevention and control measures will not adequately preclude the risk of spills into Port Valdez or protect the sensitive Duck Flats environment.

#### Analysis of alternatives

Review of the record in this case indicates that alternatives to the proposed project are currently available and practicable. Alternative actions which would allow the transfer of refined petroleum products but which would have less impact on valuable aquatic resources must be explored more thoroughly.

The Section 404(b)(1) Guidelines provide that the level of analysis of potential alternatives to a proposed activity should reflect the nature of anticipated adverse impacts. The considerable environmental value of the Duck Flats and the significant potential for adverse impacts from the proposed permit modification requires that a particularly careful analysis of alternatives be conducted. In reaching its decision to issue the proposed permit modification, the Alaska District appears to have inappropriately rejected less damaging, practicable, alternatives to the modification that are available to the applicant. EPA is particularly concerned that, during the review of the potential adverse impacts of various alternatives, the District inappropriately factored proposed mitigation measures into the evaluation of impacts associated with the proposed permit modification. Mitigated impacts associated with the proposed project were subsequently compared to unmitigated impacts associated with other alternatives. This biased analysis then supported the District's conclusion that the proposed project was the least environmentally damaging alternative. The approach is inconsistent with the EPA/Department of Army Memorandum of Agreement on mitigation and the Section 404(b)(1) Guidelines regarding selection of the least environmentally damaging practicable alternative as required under Section 230.10(a) of the Guidelines. Contrary to the District's findings, we believe that at least four alternative sites would be both practicable and less environmentally damaging.

In particular, EPA does not agree with the District's findings regarding the practicability of the Alyeska Marine Terminal as a less environmentally damaging alternative to the proposed permit modification. EPA agrees with the District's finding that since the Alyeska facility already exists, is located close to the refinery and enjoys a favorable location for transport vessel access, the alternative of siting Petro Star's operation at the Alyeska is very attractive. Additionally, the risk of this alternative to

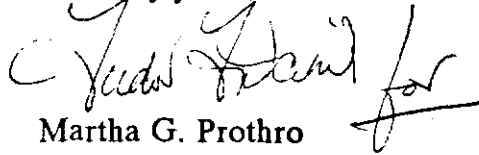
adversely effect aquatic resources of national importance is considerably less than that of the proposed permit modification. EPA disagrees with the District's conclusion that negotiation of business agreements and the requirement for further regulatory review limits the practicability of this less damaging alternative.

Conclusion

In conclusion, the record clearly illustrates that the aquatic resources associated with the Valdez Duck Flats constitute an aquatic resource of national importance. The record also indicates that while the proposed permit modification contains mitigation measures designed to prevent and respond to damages to the Duck Flats area from spills of refined petroleum product, those measures do not adequately address the risk of spills and associated adverse impacts to the aquatic environment. Finally, in light of the probability of chronic and potentially catastrophic spills, and recognizing the unique and outstanding environmental values of the Valdez Duck Flats area, the record does not support the District's conclusion that the permit modification, as proposed, is the least damaging practicable alternative to meet the project purpose. Therefore, I request that you review the Alaska District's decision to approve the proposed permit modification.

I hope that you will carefully review the record on the proposed permit modification and look forward to your response to our concerns. If my staff can provide assistance during your evaluation of this request, please have your staff direct questions to Clayton T. Miller of the Wetlands Division at 202-260-6464.

Sincerely yours,

  
Martha G. Prothro  
Acting Assistant Administrator

Enclosure

ENCLOSURE 1

ASSISTANT ADMINISTRATOR'S  
EVALUATION AND REQUEST FOR REVIEW  
CITY OF VALDEZ/PETRO STAR

This referral meets the criteria in Part IV of the 1992 Section 404(q) Memorandum of Agreement based upon EPA's findings that this project, including mitigation measures, will result in unacceptable adverse effects to aquatic resources of national importance. EPA believes that the proposed permit modification is likely to result in adverse impacts to the aquatic environment as a consequence of spillage of refined petroleum products into an environmentally sensitive area known as the Valdez Duck Flats. The Valdez Duck Flats' wetland system provides significant habitat for fish and aquatic wildlife, primary biological production and food chain support, and numerous recreational opportunities (e.g. bird watching, hiking). Further, EPA believes that the Alaska District Corps of Engineers did not appropriately review the availability of less damaging, practicable alternatives that would satisfy the purpose of the proposed permit modification. EPA has determined that the permit modification would result in the avoidable loss or significant impairment of aquatic functions and values associated with the natural wetland system at the Valdez Duck Flats and, consequently, that the permit modification request should be denied.

Under Sections 230.11(g) and 230.11(h) of the Section 404(b)(1) Guidelines (Guidelines), cumulative and secondary impacts to the aquatic ecosystem that are associated with a discharge of dredged or fill materials, but are not a direct result of the actual placement of the dredged or fill material, are to be considered in determining compliance with the Guidelines. The adverse impacts that would accompany the proposed permit modification are encompassed by Sections 230.11(g) and 230.11(h) and must be fully considered in reaching a conclusion regarding issuance of the permit modification. Further, EPA believes the proposed permit modification is in direct conflict with the previous Department of Army review for the Valdez Container Terminal Section 404 permit. Under the terms of that permit, the impacts of the activities that would have been authorized by the proposed permit modification were considered and these activities were expressly precluded by a permit condition. Based on the significant environmental concerns these issues raise, issuance of the proposed permit modification warrants Headquarters level review by the Assistant Secretary of Army for Civil Works.

Project Description and History

Project Description The City of Valdez, Alaska, on behalf of the Petro Star Valdez Refinery Joint Venture (Petro Star), has proposed to construct a loading facility for the transfer of refined petroleum products at the Valdez Container Terminal (VCT) (see

Figure 1). The project would involve the installation of a 5,600-foot long, 10-inch diameter pipeline from Petro Star's newly constructed tank farm to the VCT.

Petro Star would operate the pipeline and loading facility, supplying products from its new refinery at Dayville Road, on the south side of Port Valdez, approximately seven road miles from the VCT. The refinery, a crude oil topping unit built on fill authorized by the Corps' Nationwide Permit #26, is permitted to withdraw 1.26 million gallons of crude oil per day from the Trans Alaska Pipeline to process into refined products for sale throughout south-coastal and interior Alaska. The plans reviewed and evaluated by the Alaska District involve the trucking of refined petroleum products from the refinery to a tank farm located six miles from the refinery on a 2.5-acre site near the VCT, at the rate of approximately twenty loads per day, each load providing 9,000 gallons.

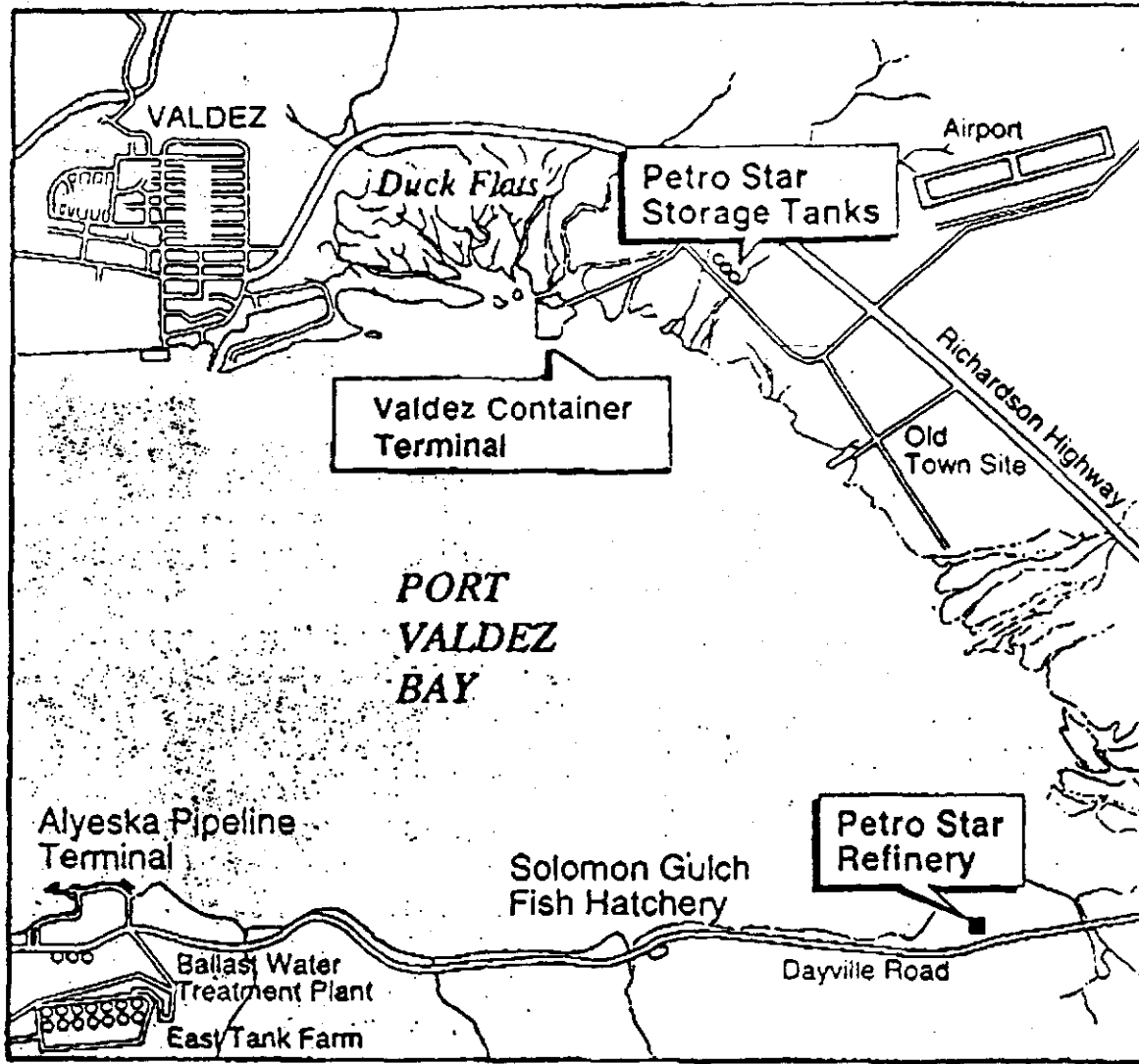
The proposed pipeline would extend slightly more than one mile from the tank farm to a loading facility at the VCT, passing beneath Siwash Creek and suspended below the 1,500-foot long pile-supported trestle leading to the VCT. The pipeline would terminate at the floating dock at the south end of the VCT, from where it would dispense the refined products.

**Project History** The City of Valdez is a party to the proposal as the owner of, and permittee for, the VCT. The permit, Port Valdez 83, which the Corps of Engineers (Corps) issued on January 24, 1980, authorized the placement of fill in 21 acres of wetlands and other waters, as well as dredging, the construction of a dock, ramps, walkways, mooring dolphins, a 1,500-foot long trestle, and an 1,800-foot long causeway to create a bulk cargo transfer facility, now referred to as the VCT.

During evaluation of the Port Valdez 83 permit application, the Corps recognized the clear potential for adverse secondary and cumulative impacts associated with the VCT. The Corps' 1980 Environmental Assessment noted that "the construction and operation of facilities similar in nature to this project have resulted in the degradation of water quality by the introduction of hydrocarbons. However, the project has been designed to minimize this possibility and other possible sources of water degradation. No fluid transfer of petroleum products or other hazardous substances will occur at the facility." To insure that adverse impacts were minimized, the Corps added to the permit seven special conditions, most notably Special Condition "f", which expressly prohibited the City from storing or dispensing petroleum products at the VCT, except for products in containerized shipping units. Following two minor permit modifications, the City completed the VCT in 1983.

On January 8, 1993, the Alaska District approved a third modification of the permit, which broadened the authorized uses of the VCT to include the refueling and repair of vessels and the mooring of cruise ships, ammunition carriers, military ships, crude oil tankers, and tanker escort vessels, as well as the handling of uncontainerized

Figure 1 Eastern Port Valdez



bulk cargo such as pipe, logs and woodchips. The approval modified Special Condition "f" to allow limited storage and dispensing of petroleum products including storage of those products necessary for facility operation and maintenance, and dispensing of petroleum products by mobile tanker truck for refueling or as secondary cargo only.

During the 1979 review and evaluation of construction of the VCT, considerable public concern was raised regarding siting of the Terminal. This concern arose, in part, from a recognition of the unique environmental values of the area known as the Valdez Duck Flats (Duck Flats), and from the adverse impacts that the development of the port could have on this sensitive area. A primary concern centered on the risks and impacts of handling petroleum products on the VCT, which was to be located directly adjacent to the Duck Flats. At the time the project was reviewed, the City indicated that it preferred to keep all petroleum-related activities on the south side of Port Valdez. The City's interest in protecting the Duck Flats was reflected in their revised Section 404 permit application which clarified that the intended use of the VCT would be solely for transfer and shipment of containerized and bulk cargo. The application indicated that there would be "[n]o fuel handling of any kind" at the VCT. At the time of permit issuance, the Corps acknowledged concerns regarding adverse impacts of petroleum related activities in their Environmental Assessment, 404(b)(1) Evaluation and Findings of Fact for the VCT. As a result of the Corps review, Special Condition "f" was placed on the Port Valdez 83 permit. It is a change to special condition "f" that is the subject of the Corps permit modification and this elevation request.

#### Aquatic Resources of National Importance

The area that would be directly affected by the proposed permit modification includes over 1,000 acres of the Valdez Duck Flats located in the City of Valdez, on the north side of Port Valdez, a fjord which, with Valdez Arm, forms a 29-mile long embayment in Prince William Sound. The majority of the shoreline of Port Valdez is steep and rocky. However, several of its riverine systems have formed outwash deltas with associated tidal flats. These areas comprise approximately twenty percent of the Port Valdez shoreline. An extensive tidal flat extends from the Lowe River (adjacent to the Petro Star refinery) north and west to the Duck Flats. Two salt marsh complexes are associated with this tideflat, the Dayville Flats adjacent to the Lowe River, and the Duck Flats (see Figure 2). The Duck Flats is the larger and more diverse of the two systems, containing the largest salt marsh (460 acres) in Port Valdez and one of the largest in Prince William Sound. Its habitat types include tidal salt marsh, inter- and subtidal mud flats, submerged aquatic moss beds, scrub-shrub wetlands, forested islands with rocky shores, freshwater streams, and subtidal ponds (see Figure 3). The Duck Flats, because of its size, is considered to be vital habitat for many fish and wildlife species. In fact, the Duck Flats are widely regarded to be the most productive ecosystem in Port Valdez and appear to be the most highly utilized by fish and wildlife (see Figure 4).

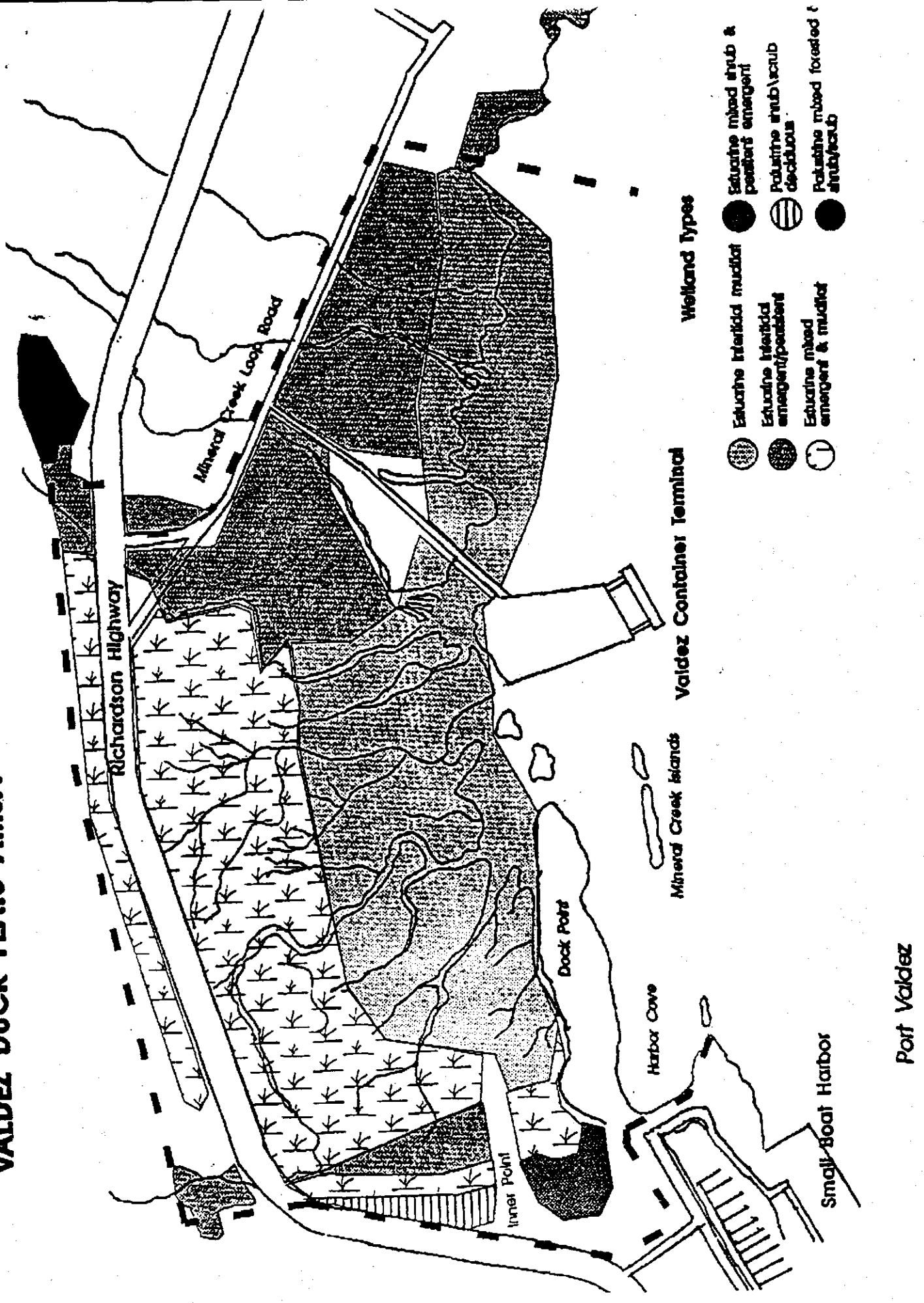




# VALDEZ DUCK FLATS AMSA

Figure 3

Wetlands and Intertidal Mudflats of the Valdez Duckflats





**Fish and Wildlife Values** The Duck Flats area provides critical habitat support for the various life stages of a wide variety of fish, bird and mammal species, as well as a rich invertebrate population. The diversity of fish, wildlife and birds are drawn to the Duck Flats area by the availability of feeding, resting, nesting and spawning habitat. Additionally, a rich concentration of invertebrate species, including worms, clams, mussels, barnacles, crustaceans, and a variety of snails (see Figure 5 and Table 1), that flourish in the area because of detritus supplied by the abundant algal growth, serves as a base for the Port Valdez coastal marine and estuarine food chain.

**Fish** Seven anadromous fish streams, or 21 percent of the anadromous fish streams in the Port Valdez area, flow through the Duck Flats area (see Figure 6). The area that would be adversely affected by the proposed permit modification supports over ten species of marine, freshwater and anadromous fish as well as the associated aquatic organisms on which they depend. The Duck Flats and its associated aquatic environment, including the anadromous fish streams, provide spawning, incubation, feeding, cover and rearing habitat for several fish species of vital economic interest to Alaska and to the Nation, including four of the five Pacific salmon species (pink, chum, coho and sockeye), as well as Pacific herring, Dolly Varden and eulachon. Although there are numerous clearwater streams which enter Port Valdez and have the gravel substrate that provides suitable spawning habitat, the steepness of the terrain surrounding Valdez reduces the actual spawning area to the lowest reaches of the streams, and often to intertidal spans of each stream. All seven of the Duck Flats streams are classified as important spawning habitat for salmonids by the Alaska Department of Fish and Game.

The majority (95%) of the salmon caught in Port Valdez are either pink salmon (72%) or chum salmon (23%). Sixty percent of eastern Port Valdez's natural pink salmon population spawn in the Duck Flats' streams, with forty percent returning to one particular stream, the North Fork of Siwash Creek. The Duck Flats' streams also support a large percentage (over forty percent) of the natural chum salmon run, nearly all of which returns to City Limits Creek (see Table 2). Within the Port Valdez area all salmon spawn in intertidal and above-tide reaches of the streams. Pink and chum fry emerge from the gravels in early to mid-April and move to brackish areas of streams within a few hours or days. Out-migration of pink and chum salmon from Port Valdez usually takes two to three weeks, and is generally complete by mid- to late June of each year.

In addition to spawning habitat, the extremely productive Duck Flats area provides a important feeding area for populations of chum and pink salmon fry. Moreover, due to the predominantly counterclockwise circulation pattern in Port Valdez, a majority of the fry from the more than 16 anadromous fish streams in eastern Port Valdez, as well as fish from a hatchery located at Solomon Gulch on the south side of the bay, migrate through, and rear in, the Duck Flats area. The success of the Duck Flats area as feeding habitat is sustained by the substantial Port Valdez tidal exchange combined with the numerous freshwater streams which flow into the Duck Flats. This

Figure 5 Invertebrate Distribution in Valdez Duck Flats

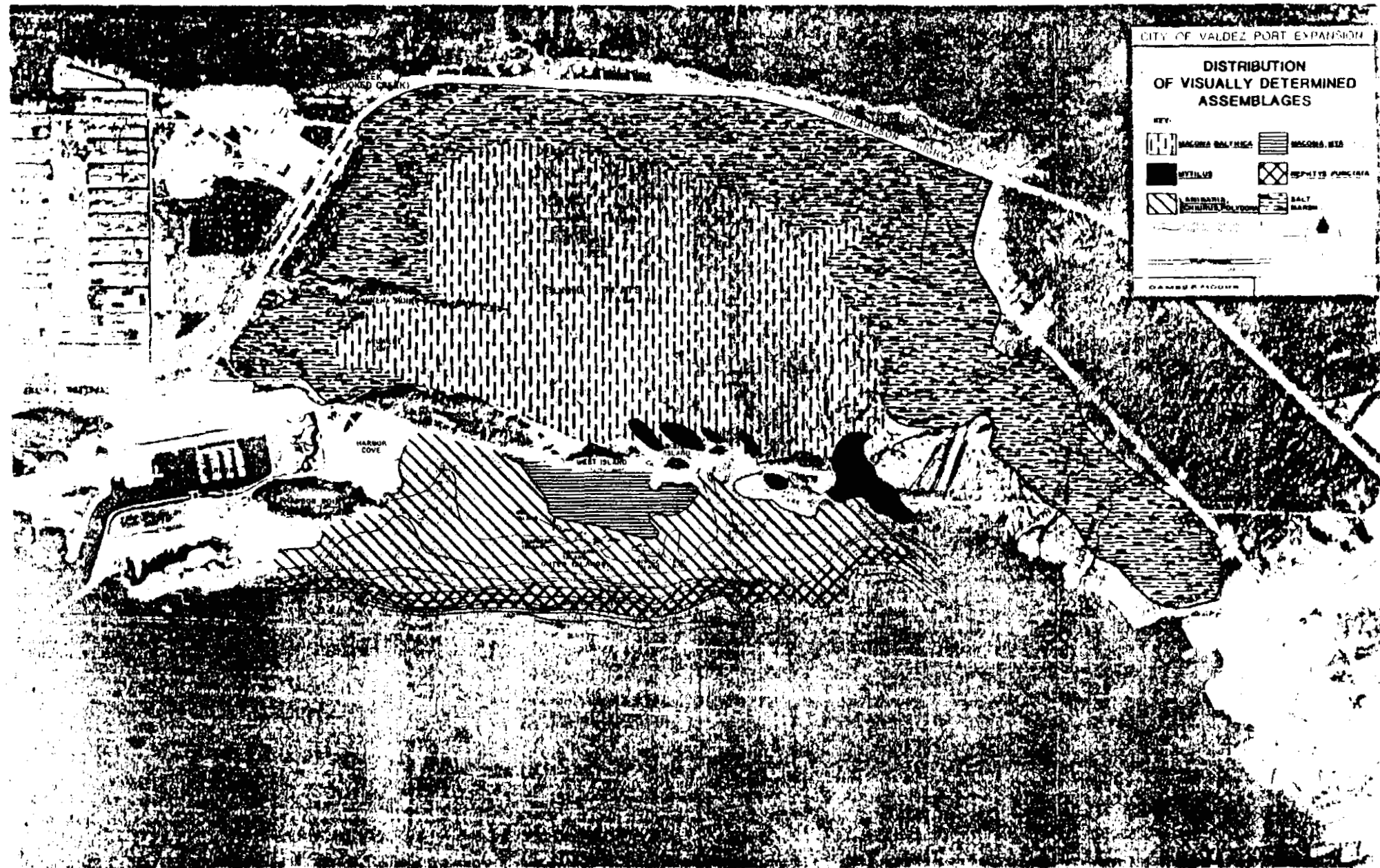


Table 1: Invertebrates that are Present at the Valdez Duck Flats

ORDER	CLASS	SPECIES
Annelida	Polychaeta	<u>Barantolla americana</u>
		<u>Eteone longa</u>
		<u>Euchone analis</u>
		<u>Fabricia sabella</u>
		<u>Haploscolopus panamensis</u>
		<u>Laonome kroyeri</u>
		<u>Lumbrineris luti</u>
		<u>Owenia fusiformis</u>
		<u>Pholoe minuta</u>
		<u>Polydora quadrilobata</u>
		<u>Prionospio steenstrupi</u>
		<u>Pygospio elegans</u>
		<u>Syllis sp.</u>
		<u>Tharyx multifilis</u>
Mollusca	Gastropoda	<u>Aglaja diomedea</u>
		<u>Cingula katherinae</u>
		<u>Littorina sitkana</u>
Mollusca	Pelecypoda	<u>Axinopsida sericata</u>
		<u>Macoma balthica</u>
		<u>Mytilus edulis</u>
		<u>Orobitella rugifera</u>
Arthropoda	Insecta	<u>Diptera spp.</u>

ORDER	CLASS	SPECIES
Arthropoda	Crustacea	<u>Eudorella</u> sp.
		<u>Gnorimosphaeroma</u> <u>oregonensis</u>
		<u>Leptocuma</u> sp.





Table 2: Salmon Escapement in Streams  
of Eastern Port Valdez

Valdez Duck Flats Streams

Stream	Pink Salmon Escapement	Chum Salmon Escapement
City Limits Creek	2,192	1,251
City Limits Slough	150	0
Ess Creek	65	32
North Fork and South Fork, Siwash Creek	20,433	66
Loop Road No. 2 Creek	3,475	7
Loop Road No. 1 Creek	4,623	0
Duck Flats Total	30,938	1,356

Streams South of the Valdez Duck Flats

Stream	Pink Salmon Escapement	Chum Salmon Escapement
Sewage Lagoon Creek	823	0
Robe River	7,783	29
Lowe River	7,295	411
Abercrombie Gulch Creek	945	425
Dayville Flats Creek	1,300	---
Unnamed Creek	---	---
Solomon Gulch Creek	1,500	10
Unnamed Creek	---	---
Allison Creek	275	700
South Side Total	19,921	1,575

Eastern Port Valdez Total:            50,859 Pink            2,931 Chum

distinctive circumstance provides the basis for the food web which sustains juvenile salmonids prior to their migration into the marine environment.

Yearly, over 14 million wild salmon fry are produced or reared in the Duck Flats. Based on 1988-1991 information provided by the Alaska Department of Fish and Game concerning the average commercial value of pink and chum salmon, it is estimated that the total value of wild salmon produced and reared in the Duck Flats is approximately \$2.3 million per year.

**Birds** In addition to the considerable fishery resources supported by the area that would be affected by the permit modification, eighty-four migratory and resident bird species utilize the Duck Flats for feeding, nesting, rearing, resting, molting, refuge, and staging (see Table 3 and 3a). Bird census data for the Duck Flats area indicates that a greater variety of species and a larger number of individuals utilize the Duck Flats than other Port Valdez areas.

A diversity of migratory bird species stopover at the Duck Flats during spring and autumn migrations. The tidal exchange and freshwater input into the Duck Flats salt marsh that results in superior feeding habitat for salmonids, also results in exceptional habitat for invertebrate species that in turn provide an important food source for migratory birds such as northern phalarope, horned grebe, and Bonaparte's gull. In the spring, migrating waterfowl and shorebirds rest, nest and feed on the mudflats and surrounding marsh. Juvenile salmonids and other small fish provide a valuable food source for bird species such as the common merganser, Arctic tern, greater scaup, gadwall, Barrow's goldeneye and common goldeneye.

The Duck Flats area also provide nesting, molting and staging habitat for migratory shorebirds and waterfowl. Several waterfowl species, including American widgeon, green-winged teal, mallard, and pintail are among the species nesting in the Duck Flats. Although the Duck Flats is not the largest waterfowl nesting area in Port Valdez, the area's contribution to nesting habitat is nonetheless vital to affected waterfowl populations because of the relative scarcity of such habitat in eastern Port Valdez. Arctic terns and black-legged kittiwakes nest along the fringes of the Duck Flats; they and other seabirds find a rich feeding ground along the southern edge of the Flats. Several species of seabirds and waterfowl overwinter in the Duck Flats. Due to the numbers of salmon spawning in the Duck Flats, bald eagle also tend to congregate there with as many as six bald eagle nesting sites confirmed in the Duck Flats area.

**Marine Mammals** The Duck Flats area serves as important feeding and resting habitat for marine mammals in Port Valdez. Several marine mammals, including sea otters, harbor seals and the threatened Steller sea lion feed along the southern edge of the Duck Flats and haul out on the shores of the islands south of the Duck Flats area.

Table 3: Birds that Use the Valdez Duck Flats

Family	Common Name	Scientific Name
Gaviidae	Common Loon	<u>Gavia immer</u>
	Pacific Loon	<u>G. pacifica</u>
Podicipedidae	Horned Grebe	<u>Podiceps auritus</u>
	Red-necked Grebe	<u>P. grisegena</u>
Phalacrocoracidae	Double-crested Cormorant	<u>Phalacrocorax auritus</u>
Ardeidae	Great Blue Heron	<u>Ardea herodias</u>
Anatidae	Brant	<u>Branta bernicla</u>
	Canada Goose	<u>B. canadensis</u>
	**Green-winged Teal	<u>Anas crecca</u>
	**Mallard	<u>A. platyrhynchos</u>
	**Northern Pintail	<u>A. acuta</u>
	Northern Shoveler	<u>A. clypeata</u>
	**American Wigeon	<u>A. americana</u>
	Greater Scaup	<u>Aythya marila</u>
	Harlequin Duck	<u>Histrionicus histrionicus</u>
	Oldsquaw	<u>Clanqula hyemalis</u>
	Black Scoter	<u>Melanitta nigra</u>
	Surf Scoter	<u>M. perspicillata</u>
	White-fronted Goose	<u>Anser albifrons</u>
	Gadwall	<u>Anas strepera</u>
	White-winged Scoter	<u>M. fusca</u>
	Common Goldeneye	<u>Bucephala clanqula</u>
	Barrow's Goldeneye	<u>B. islandica</u>
Bufflehead	<u>B. albeola</u>	
Common Merganser	<u>Merqus merganser</u>	
Red-breasted Merganser	<u>M. serrator</u>	
Accipitridae	**Bald Eagle	<u>Haliaeetus leucocephalus</u>
	Sharp-shinned Hawk	<u>Accipiter striatus</u>
Phasianidae	Willow Ptarmigan	<u>Lagopus lagopus</u>
	White-tailed Ptarmigan	<u>L. leucurus</u>

Family	Common Name	Scientific Name
Haematopodidae	**Black Oystercatcher	<u>Haematopus bachmani</u>
Scolopacidae	Greater Yellowlegs	<u>Tringa melanoleuca</u>
	Lesser Yellowlegs	<u>T. flavipes</u>
	Wandering Tattler	<u>Heteroscelus incanus</u>
	Spotted Sandpiper	<u>Actitis macularia</u>
	Whimbrel	<u>Numenius phaeopus</u>
	Bristle-thighed curlew	<u>N. tahitiensis</u>
	Hudsonian Godwit	<u>Limosa haemastica</u>
	Ruddy Turnstone	<u>Arenaria interpres</u>
	Semipalmated Sandpiper	<u>Calidris pusilla</u>
	Western Sandpiper	<u>C. mauri</u>
	Least Sandpiper	<u>C. minutilla</u>
	Pectoral Sandpiper	<u>C. melanotos</u>
	Rock Sandpiper	<u>C. ptilocnemis</u>
	Short-billed Dowitcher	<u>Limnodromus griseus</u>
	Long-billed Dowitcher	<u>L. scolopaceus</u>
	Common Snipe	<u>Gallinago gallinago</u>
	Black-bellied Plover	<u>Pluvialis squatarola</u>
	**Semipalmated Plover	<u>Charadrius semipalmatus</u>
	Red-necked Phalarope	<u>Phalaropus lobatus</u>
Laridae	Bonaparte's Gull	<u>Larus philadelphia</u>
	Mew Gull	<u>L. canus</u>
	Herring Gull	<u>L. argentatus</u>
	Glaucous-winged Gull	<u>L. glaucescens</u>
	**Black-legged Kittiwake	<u>Rissa tridactyla</u>
	**Arctic Tern	<u>Sterna paradisaea</u>
Alcidae	Common Murre	<u>Uria aalge</u>
	Pigeon Guillemot	<u>Cepphus columba</u>
Trochilidae	Rufous Hummingbird	<u>Selasphorus rufus</u>
Alcedinidae	Belted Kingfisher	<u>Ceryle alcyon</u>

Family	Common Name	Scientific Name
Hirundinidae	Violet-green Swallow	<u>Tachycineta thalassina</u>
	Cliff Swallow	<u>Hirundo pyrrhonota</u>
Corvidae	Steller's Jay	<u>Cyanocitta stelleri</u>
	Black-billed Magpie	<u>Pica pica</u>
	Northwestern Crow	<u>Corvus caurinus</u>
	Common Raven	<u>C. corax</u>
Paridae	Chestnut-backed chickadee	<u>Parus rufescens</u>
Cinclidae	American Dipper	<u>Cinclus mexicanus</u>
Muscicapidae	Ruby-crowned Kinglet	<u>Regulus calendula</u>
	Hermit Thrush	<u>Catharus guttatus</u>
	American Robin	<u>Turdus migratorius</u>
	Varied Thrush	<u>Ixoreus naevius</u>
Motacillidae	Water Pipit	<u>Anthus spinoletta</u>
Parulinae	Orange-crowned Warbler	<u>Vermivora celata</u>
Emberizinae	Savannah Sparrow	<u>Passerculus sandwichensis</u>
	"Fox Sparrow	<u>Passerella iliaca</u>
	Song Sparrow	<u>Melospiza melodia</u>
	Golden-crowned Sparrow	<u>Zonotrichia atricapilla</u>
	White-crowned Sparrow	<u>Z. leucophrys</u>
	Slate-colored Junco	<u>Junco hyemalis</u>
	Lapland Longspur	<u>Calcarius lapponicus</u>
	Snow Bunting	<u>Plectrophenax nivalis</u>
Icterinae	Rusty Blackbird	<u>Euphagus carolinus</u>
Fringillidae	Common Redpoll	<u>Carduelis flammea</u>

\*\*Known to nest in Eastern Port Valdez.

Table 3a: Probable Water-related Bird Species  
that Would Use the Valdez Duck Flats

Family	Common Name	Scientific Name
Gaviidae	Red-throated Loon	<u>Gavia stellata</u>
Phalacrocoracidae	Pelagic Cormorant	<u>Phalacrocorax pelagicus</u>
Accipitridae	Northern Harrier	<u>Circus cyaneus</u>
Falconidae	Merlin	<u>Falco columbarius</u>
	Peregrine Falcon	<u>F. peregrinus</u>
Strigidae	Short-eared owl	<u>Asio flammeus</u>
Scolopacidae	Lesser Golden Plover	<u>Pluvialis dominica</u>
	Dunlin	<u>Calidris alpina</u>

Recreational Values In addition to fisheries and wildlife values, the Valdez Duck Flats provide the City of Valdez with an important and valuable recreational asset. Thousands of tourists, both domestic and international, visit Valdez each year. A majority of the Duck Flats wetlands are located along the sole highway leading out of Valdez and provide a unique opportunity for visitors to experience an uncommon, natural mosaic of wetlands, mudflats and freshwater streams in Port Valdez. The attraction of this area is evidenced by a vehicle turnout on the north side of the Duck Flats which provides visitors a rare opportunity to view salmon spawning.

The recreational value of the Duck Flats area appeals to local residents as well, with both tourists and residents enjoying bird watching opportunities, biking/hiking/skiing trails and picnic areas available there. The Duck Flats area also provides an unspoiled, natural setting for environmental education and research activities. Finally, the area plays a major role in the annual Christmas Bird count, which has been a traditional event in Valdez for almost twenty years.

Area Meriting Special Attention As part of the development of the Valdez Coastal Management Program in the early 1980s, and in accordance with State Coastal Management Program standards, the City of Valdez proposed to designate the Duck Flats as an Area Meriting Special Attention (AMSA). The designation of an area as an AMSA is seen as a means of providing special management attention to areas of 1) unique, scarce, fragile, or vulnerable natural habitat, cultural value, historic significance, or scenic and recreational value; 2) significant geophysical hazard; 3) important subsistence or research; and 4) potential marine sanctuaries. The proposed designation of this area reflects the documented high values and the high potential for conflicting uses within the Duck Flats and played a major part in resource agency acceptance of the construction of the VCT. During discussions between the resource agencies and the City of Valdez during the Port Valdez 83 permit review, the agencies expressed their concerns regarding the construction and operation of the VCT. To aid in alleviating these concerns, the City agreed to pursue AMSA designation for the Valdez Duck Flats.

The lengthy process of preparing a final plan to manage the AMSA has yet to be completed. However, the last published draft AMSA plan for the Duck Flats area, dated February 1992, classified the VCT and its causeway and trestle approach as a zone for potential development, but only with significant environmental restrictions. The draft plan notes that activities at the VCT are of concern due to the potential for, among other things, spills of hazardous or toxic substances and the subsequent impacts on biological and water quality values.

#### Substantial and Unacceptable Impacts

Anticipated adverse environmental impacts from the proposed permit modification are associated with chronic and catastrophic spillage of petroleum products

from permitted activities. EPA is concerned that significant spillage and leakage could occur from the pipeline, receiving vessels or transfer connections at the transfer facility.

The proposed pipeline from the tank farm to the loading facility would have a total capacity of 22,344 gallons of refined petroleum product. Initially, the proposed fuel transfer operation would involve the loading of a 3.11 million gallon barge once every twelve days. As proposed, the transfer process would take approximately 18 to 24 hours. EPA believes that even under this limited scenario, a significant possibility for spills into the sensitive Duck Flats area exists. EPA is concerned about spills ranging from chronic small leakage associated with loading activities to a catastrophic loss of the entire contents of the barge and pipeline. Further, we believe that the proposed preventative and response mitigation would not provide adequate protection to aquatic resources in the Duck Flats area.

Likelihood of Spills The U.S. Coast Guard, the Alaska Department of Environmental Conservation (ADEC) and the petroleum industry indicate that, despite the development and adoption of often elaborate spill prevention plans and mitigation measures, accidental petroleum spills to the aquatic environment can and do occur in Alaskan waters. While these spills occur from a variety of sources, typical problems associated with marine terminals, including transfer facilities such as the proposed VCT facility, leading to spills include: leaks from corrosion, frozen pipes, pipeline rupture, pipeline seam failure, control valve malfunctions, blown check valves, equipment failure due to weather and human error. The National Research Council reports that the average annual amount of petroleum products spilled at marine terminals in the United States, due solely to human error is approximately 900,000 gallons.

Spills of petroleum products are, unfortunately, far from unique in Port Valdez and surrounding areas. The U.S. Coast Guard Marine Safety Office (Valdez) reported that between 1988 and 1991, 723 petroleum product spills occurred in the Prince William Sound area, including Port Valdez. One indication of the chronic occurrence of petroleum spills in the area is the Coast Guard characterization of the City's small boat harbor as having a "constant sheen" of oil from small, chronic spills. Fortunately, this harbor is located "down current" of the Duck Flats and is separated from the Duck Flats by a fill breakwater and a peninsula known as Dock Point. Other sources of spills are the City and Tesoro Docks also to the west and "down current" of the Duck Flats area where the spill material is directed away from the area's sensitive aquatic resources. While the numerous other petroleum handling operations in Valdez provide a significant opportunity for spills into Port Valdez, none of the current major operations are in close enough proximity to the Duck Flats area to present a major risk to the area.

Finally, it should be noted that limited refueling activities at the VCT, allowed under the January 1993 permit modification, are also an existing source of chronic petroleum product discharge to Port Valdez. While the VCT spills have been small in size, EPA remains concerned about the chronic effects of these spills. EPA further



believes that an increased number of small chronic spills that would likely result from the proposed permit modification is likely to result in adverse cumulative impacts to the Duck Flats.

**Mitigation Effectiveness** The Alaska District based its decision to approve this modification, primarily on the mitigation measures proposed by Petro Star and the regulatory controls governing their operation. Throughout the Draft Environmental Assessment and the District's Decision Document, the District refers to Federal, State and municipal regulatory controls over the proposed spill prevention and containment strategies as a basis for granting the permit modification. Based upon our experience, the District has placed unrealistic confidence on the ability of regulatory factors to successfully direct and enforce requirements for prevention and response actions at the VCT. Despite the theoretical effectiveness of the proposed spill prevention and control measures, an examination of the past Section 404 permit compliance for operation of the VCT leads EPA to question the reliability of the proposed special conditions to protect the sensitive environmental character of the Duck Flats. As elaborated below, EPA is also concerned with the appropriateness of relying on the proposed measures to prevent and respond to spillage and leakage of refined petroleum from the proposed pipeline and transfer facility.

**Spill Prevention Measures** In deciding to approve the permit modification, the Alaska District relied extensively on mitigation strategies for prevention and control of leaks and spills from the proposed pipeline and transfer facility. To address this issue, the District incorporated seven measures into a new special condition for the permit modification.

In reviewing the adequacy of these measures, our analysis has been based on the precept that the significant environmental importance of the Duck Flats area requires that any proposed measures must provide the greatest achievable level of environmental protection to the area. Further, if significant risk remains after the mitigation measures have been fully considered, this conclusion should represent a principal basis for deciding whether or not the modification should be authorized.

After review of the proposed mitigation measures, EPA concludes that Special Condition "j" of the permit modification will not provide an adequate level of protection to the Duck Flats area. The measures it describes provide questionable assurance against impacts to the Duck Flats.

Draft Special Condition "j" states: "[t]he following measures shall be incorporated into the project design and facility operation:

- 1) the pipeline shall be segmented into three sections with lined catchment boxes at each joint;

- 2) the flow of petroleum shall be controlled at the source (tank farm), at the terminus (barge loading facility), and within the pipe, by remote switches that stop the flow within 15 seconds;
- 3) leak detection equipment shall be installed beneath the pipeline for its entire length;
- 4) the pipeline shall be double walled where it is exposed along the trestle;
- 5) containment boom shall be deployed around the vessel and between the barge loading facility and shoreline prior to loading operations;
- 6) no loading operations shall occur if weather conditions are such that they would prevent a response to a spill, and shall not commence if winds are in excess of 35 knots, average wave height in excess of four feet, or visibility less than one hundred feet; and
- 7) the pipeline shall be evacuated when not in use."

EPA believes that the District has overestimated the level of protection provided by these mitigation measures and is particularly concerned about the ultimate effectiveness of measures 1, 2, 3, 5 and 7. The first three measures appear only to limit the quantity of petroleum product that could be spilled rather than prevent the spill from occurring. Further, these measures depend, in large part, on the recognition of a leak and subsequent manual interruption by facility operators. Given the extreme operating conditions that frequently exist in the Valdez area and in light of the extent to which human error may contribute to inadvertent releases of petroleum products from the facility, EPA believes that these measures will not be fully effective in preventing spills that would adversely impact the Duck Flats area.

Even with fully successful execution, the segmenting proposed in measure number one could result in an extraordinary spill of as much as 10,500 gallons. If the leak were not promptly detected and the switches closed, the amount of the spill could exceed that figure. EPA notes that Petro Star's Comparison of Environmental Impacts cited the remote flow stoppage capability to be estimated at 60 seconds from the time of leak detection to flow interruption. Under this scenario, a spill of as much as 42,000 gallons would occur.

Finally, in justifying issuance of the permit modification, the Corps' Decision Document frequently refers to measure seven which requires evacuation of the pipeline when not in use. Based on the currently proposed fueling scenario provided by Petro Star, the District's documentation concludes that this condition would render the pipeline empty 94 percent of the time and thus limit the possibility of spills. EPA notes, however, that the permit modification as written, does not preclude the transfer of

petroleum products at a greater frequency than described in the proposed fueling scenario. EPA also notes two additional concerns regarding mitigation measure number 7. First, Petro Star's documents have repeatedly referred to the evacuation requirement as "optional." If indeed the evacuation is optional or unenforceable as a permit modification condition, this measure would prove ineffective in reducing spills. Second, ADEC's pipeline office has urged against pipeline evacuation because it would repeatedly expose the interior of the pipeline to air thus increasing corrosion of the pipeline with obvious consequences to its structural integrity. The concerns we have raised regarding the proposed mitigation measures illustrate the significant questions that remain as to whether Petro Star, the City, or any of the regulatory agencies can assure a level of protection necessary to fully safeguard the unique and important environmental values of the Duck Flats and associated aquatic resources.

**Success of Spill Remediation** As elaborated above, EPA believes that the preventative mitigation measures which accompany the proposed permit modification are not adequate to assure that spills can be effectively precluded. If these measures fail, even in small part, to prevent refined petroleum products from entering the waters of Port Valdez, the permit modification proposes remediation and response procedures to prevent the spill from reaching the Duck Flats area. The remediation measures, however, do not preclude spilled products from entering and adversely impacting the Duck Flats area. This conclusion is based on the likelihood that containment of the product will fail and the effect that conditions such as wind and circulation will have on distribution of the product.

The Alaska District's Decision Document states that "[s]hould a spill occur, [it] can be adequately contained...." EPA disagrees with the level of certainty this statement conveys. One of the cornerstones for this statement is the fact that both the Corps' permit modification and the ADEC's contingency plan require Petro Star to pre-deploy a containment boom both around the barge and between the VCT and the shoreline prior to product transfer. However, this action would not adequately contain spilled products to prevent contamination of Port Valdez waters.

Refined petroleum products such as jet fuel and marine diesel are extremely difficult to contain and recover because they are less viscous than crude oil and are soluble in water. The solubility of these refined products allows for the product to be dispersed throughout the water column where floating containment booms would be significantly less effective. EPA spill response experience has shown that, with the type of products currently proposed to be transferred at the VCT, booms do not effectively contain the spill and remedial response efforts often recover only a limited percentage of the spilled products with the remainder escaping into the aquatic environment. As a result, spilled petroleum products which evade containment by floating booms are subsequently distributed through the aquatic environment by tides, winds and currents.

Although tidal currents in Port Valdez are complex because they are modified by, among other things, prevailing winds, the greatest volume of tidal exchange between Port Valdez proper and the Duck Flats occurs in the immediate vicinity of the VCT. Further, it is generally recognized that the circulation pattern within Port Valdez is counter-clockwise with the majority of the Duck Flats area "down current" from the VCT. Based on these factors, the resource agencies have historically expressed concern that a petroleum spill at the VCT would likely move toward the Duck Flats, especially during the summer months, when it would have the greatest impact on vegetation, plankton and fish and wildlife resources.

In order to determine how circulation and wind patterns might affect the behavior of a spill, the City commissioned a Water Circulation Study, which was published in December 1992. The field investigation for this study was conducted in October and November, not during the summer. Nevertheless, the study results indicated that winds would be the primary force affecting the movement of a surface-borne spill, concluding that winds blow from a direction which would move the spill toward the Duck Flats about twenty-five percent of the time (primarily during the summer). The study found that "south winds can rapidly transport spills into the [F]lats."

It is important to note that the Water Circulation Study further concluded that winds have much less effect on the movement of water below the surface layer, and that based solely on tidal action, a spill could affect almost all of the Duck Flats in approximately six hours if the tide was near low-water slack at the time of the spill (see Figures 7-1 to 7-8 and Table 4) Finally, the ADEC calculated that with winds blowing toward the Duck Flats and the tide coming in, a catastrophic spill from the barge (which they defined as 15% of its capacity) could reach the VCT-to-shoreline boom in seven minutes and impact the Duck Flats in twenty minutes. This time frame leaves very little room for error. In their December 1992 Draft Comparison of Environmental Impacts, Petro Star acknowledged that the extent of actual containment at any site is "highly conjectural."

Impacts on the Duck Flats Response-agency spill records indicate that the average spill in eastern Port Valdez is relatively limited in volume. However, chronic small spills, while less conspicuous than catastrophic events, can also have devastating effects on the aquatic environment. Although the Duck Flats are flushed by tides twice daily, the cleansing effect of such flushing on spilled petroleum diminishes once the product affixes to vegetation and/or soil. Furthermore, the National Oceanic and Atmospheric Administration recommends that cleanup of spilled petroleum products from mudflats and estuaries be avoided, because cleanup methods can be even more damaging in the long run than the immediate catastrophic effects. Finally, according to the National Ocean Service's Hazardous Materials Response and Assessment Division, refined products such as jet fuel and marine diesel are generally more acutely toxic to exposed organisms than unrefined crude oil. Furthermore, while they are relatively volatile, they are also more soluble in water, a fact which creates an additional route of exposure

Figure 7-1 through 7-8  
Progressions of Tidal Stages in Valdez Duck Flats

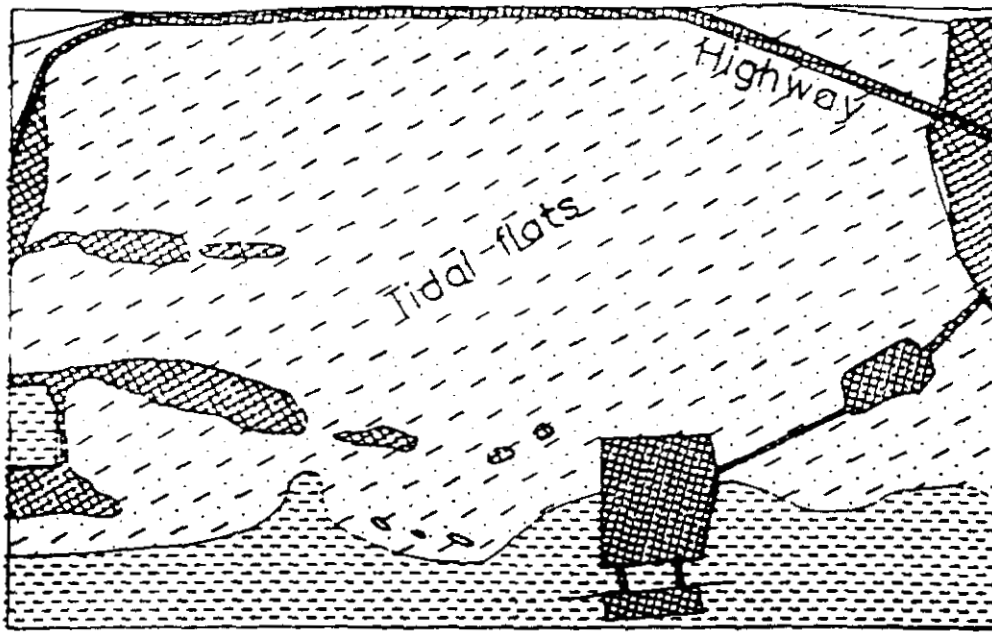


Figure 7-1. Duck Flats. Approximately at low water.

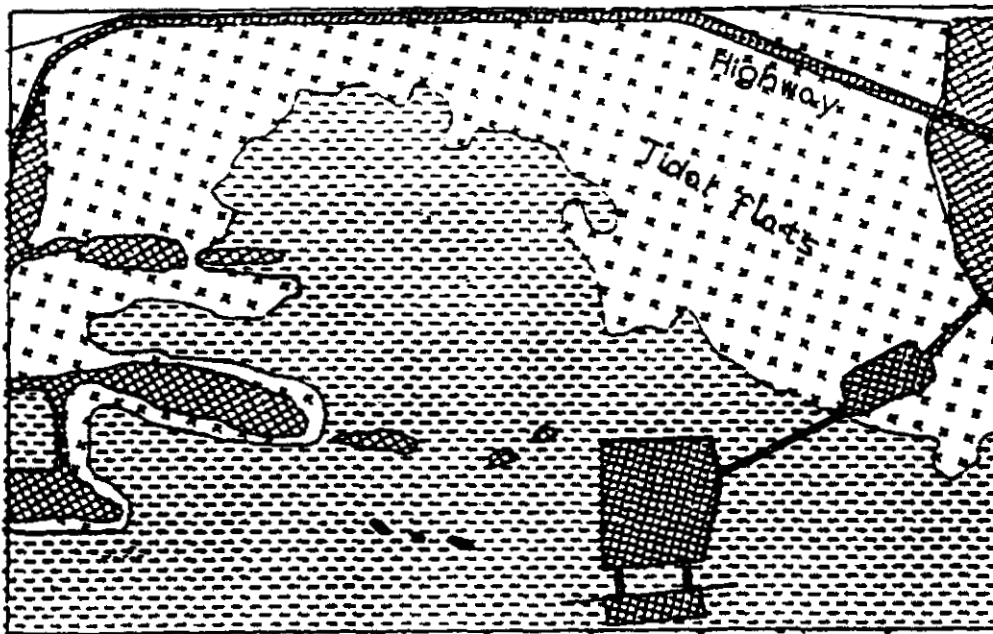


Figure 7-2. Water level 0.61 m (2 ft) above low.

Figure 7-1 through 7-8  
Progressions of Tidal Stages in Valdez Duck Flats

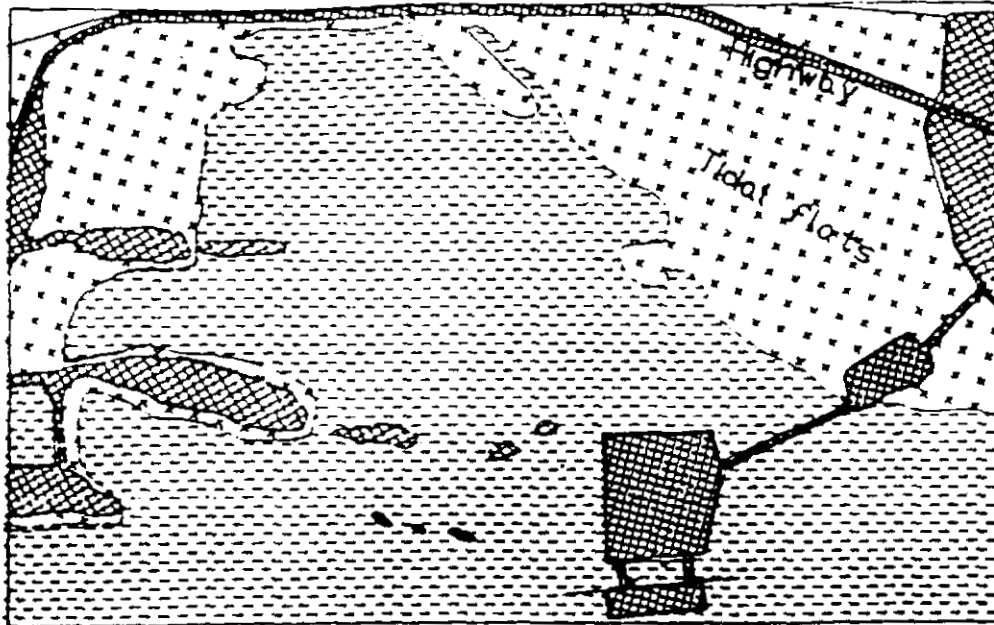


Figure 7-3 Water level 1.22 m (4 ft) above low.

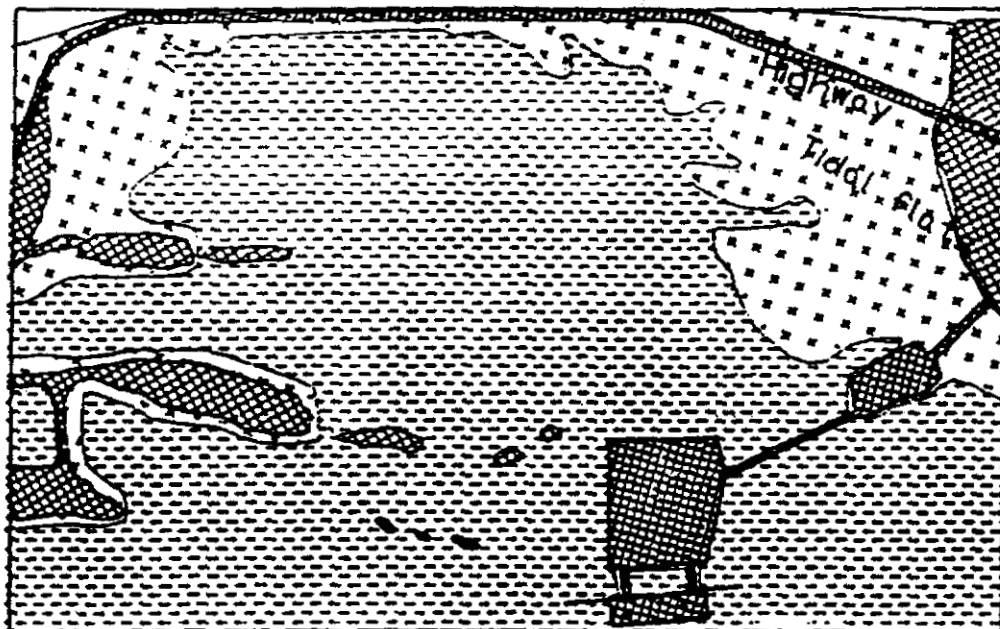


Figure 7-4 Water level 1.83 m (6 ft) above low.

Figure 7-1 through 7-8  
Progressions of Tidal Stages in Valdez Duck Flats

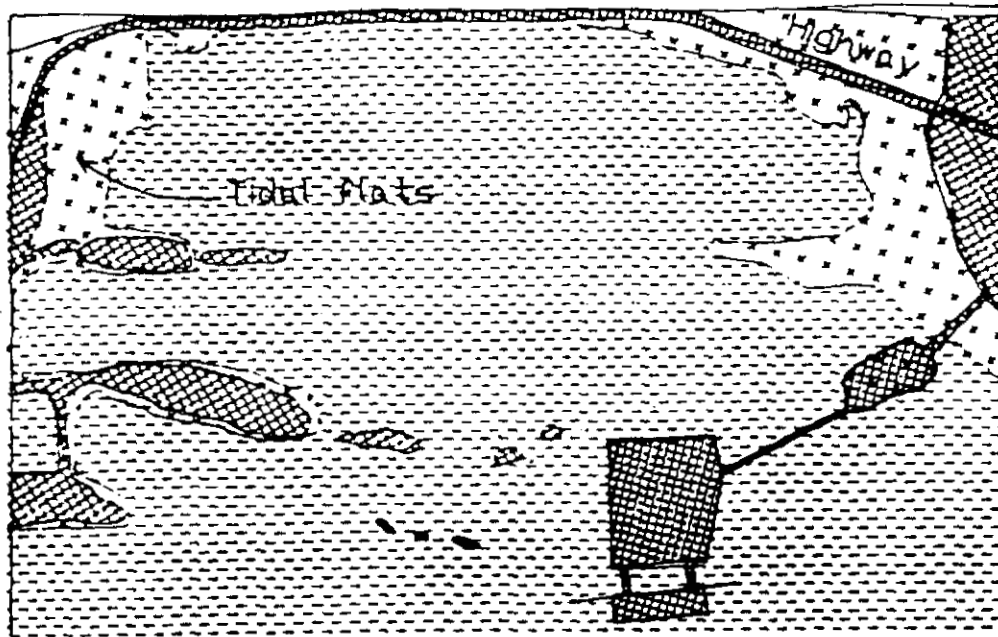


Figure 7-5 Water level 2.44 m (8 ft) above low.

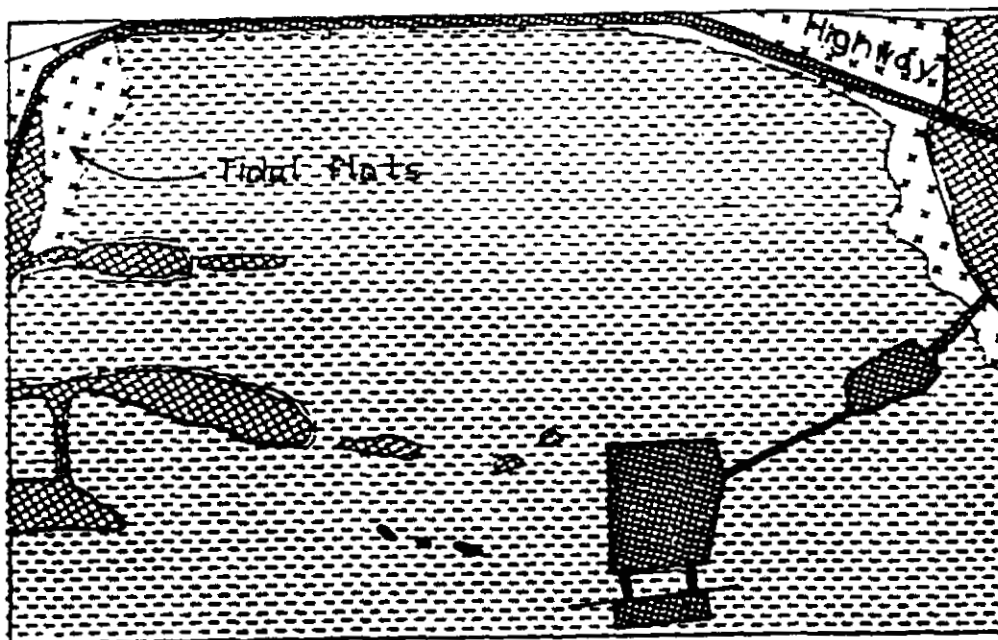


Figure 7-6 Water level 3.05 m (10 ft) above low.

Figure 7-1 through 7-8  
Progressions of Tidal Stages in Valdez Duck Flats

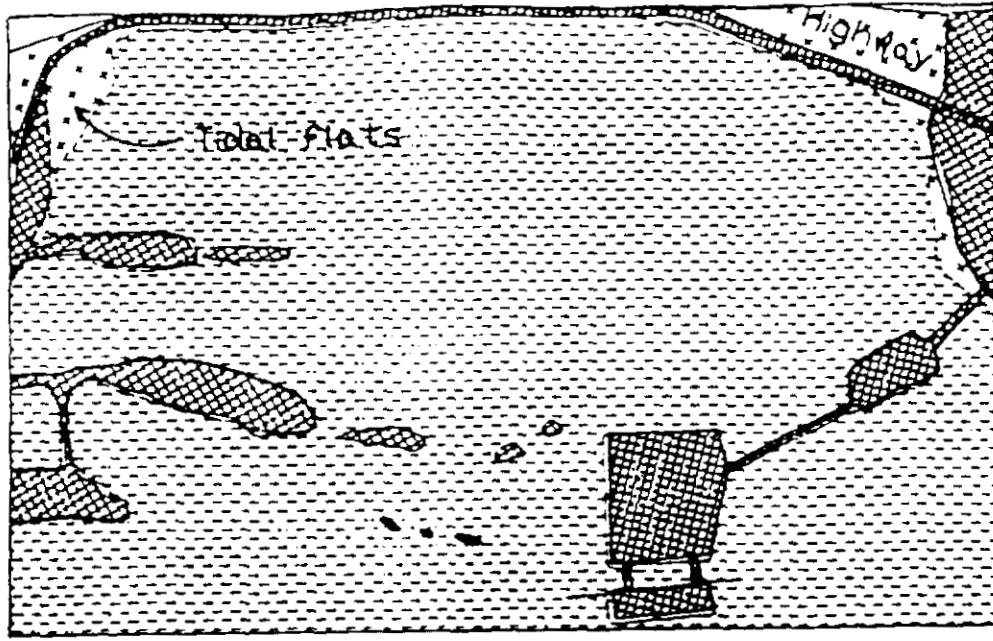


Figure 7-7 Water level 3.66 m (12 ft) above low.

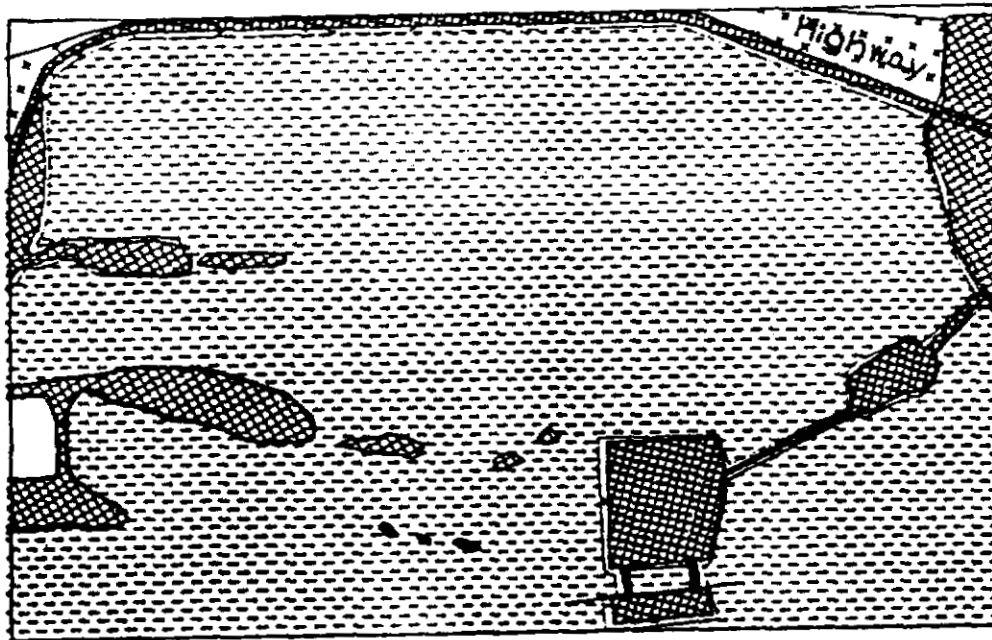


Figure 7-8 Water level 4.27 m (14 ft) above low.



Table 4: Successive Times Between Conditions  
Pictured in Figures 7-1 to 7-8

Figure Numbers	Times in hours
7-1 to 7-2	1.5
7-2 to 7-3	0.7
7-3 to 7-4	0.6
7-4 to 7-5	0.6
7-5 to 7-6	0.6
7-6 to 7-7	0.7
7-7 to 7-8	1.5
7-1 to 7-8	6.2

besides direct contact. It is evident that once a spill entered the Duck Flats, only time would be able to remedy the damage it would cause.

**Fish and Wildlife Values** As previously noted, phytoplankton form a critical base to the food chain in the Duck Flats area and the loss of these important plants would have substantial impacts on the area's aquatic ecosystem. While their concentrations are not particularly high, phytoplankton blooms do occur from late March to early July in response to increased daylight and from early August to early November due to changes in the nutrient balance of the Duck Flats' waters. Petroleum spills during these periods would adversely affect the phytoplankton component of the food chain. Additionally, it was stated in the District's draft Decision Document that potential impacts to the Duck Flats as a result of this project would include the loss of vegetation and pollution of the substrate through degradation of water quality due to contamination by petroleum products. Moreover, refined petroleum residues in the sediments would likely prohibit recolonization of several species of benthic organisms for at least six-months following contamination. Finally, exposure of invertebrate members of the food chain to refined products would likely result in their loss, with long-term adverse population effects persisting up to five years.

Spills of refined petroleum product are also likely to have a significant adverse impact on fishery resources in the Duck Flats area. In a 1973 study, Prudhoe Bay crude oil was found to be acutely toxic to pink salmon fry. It is assumed that refined petroleum products would likely be toxic at lower concentrations than crude oil. If a spill were to occur during October to April when pink and chum salmon eggs and alevins (newly hatched salmon still attached to the yolk mass) are incubating in the intertidal zones, or during salmon fry and smolt migration from April to June, or during May to September when adult salmon are returning to their natal streams to spawn, several age classes of salmon would be severely affected.

Petro Star recognized the potential adverse impacts to anadromous fish as a result of an uncontained petroleum product spill in their analysis titled Comparison of Environmental Impacts. The study states "[S]hould petroleum products enter tidally affected portions of anadromous fish spawning streams while fish eggs are incubating, or while pre-emergent sack fry are present in the gravels, significant losses could occur ... [N]umbers of resident fish could decline to a point where natural recruitment would not likely return them to their former levels for several generations (six to ten years). However, it is unlikely that whole regional populations would be affected. Impacts to fish species would be long-term." An uncontained spill during spring out-migration, when large numbers of fry from all over eastern Port Valdez are utilizing the rearing habitat of the Duck Flats, could enter the food chain and be ingested by the fry, probably resulting in fry fatality. Table 5 summarizes the sensitivity of salmon to project-related disturbances. EPA concludes that an uncontained spill of refined petroleum products would result in near- and long-term adverse impacts on recreational and commercial fisheries throughout Port Valdez and eastern Prince William Sound.

Table 5: Sensitivities of Valdez Duck Flats Fish and Wildlife to Disturbances Resulting from Modification of Port Valdez 83

<b>Animal Type</b>	<b>Affected Habitats</b>	<b>Disturbance Sensitivity</b>
<b><u>SALMON</u></b>		
spawning adults	streams, gravel intertidal zones	water quality degradation (petroleum product spills)
incubating eggs	stream and intertidal spawning areas	pollution from petroleum product spills
rearing juveniles	nearshore marine waters (pink/chum) in Duck Flats and Harbor Cove and rocky shorelines of Dock Point and the Mineral Creek Islands	interference with nutrients which support food source plankton; water pollution or petroleum product spills
<b><u>BIRDS</u></b>		
migrating, staging (spring/fall)	intertidal mudflats, shallow subtidal zones, saltmarsh	destruction of mudflats, subtidal zones or saltmarsh; water pollution or petroleum product spills which reduce food sources or harm feeding and staging birds
nesting, molting (waterfowl)	intertidal saltmarsh, exposed intertidal mudflats and shallow nearshore marine waters	destruction of vegetated nesting habitat; loss of wetland vegetation which provides protective escape cover during molting
nesting (seabirds)	Dock Point, Outer Mineral Creek Islands	destruction of nesting habitat

Animal Type	Affected Habitats	Disturbance Sensitivity
feeding (resident birds)	exposed intertidal mudflats, shallow subtidal zones	destruction of mudflats; alteration of nutrient cycling processes that support food source productivity; water pollution or petroleum product spills which decrease food source productivity or adversely affect feeding birds
<u>MARINE MAMMALS</u>		
feeding (sea otters)	shallow subtidal waters along Dock Point and the Mineral Creek Islands	water pollution or petroleum product spills which reduce the productivity or availability of food sources or directly impact otter health
harbor seals and sea lions	shallow subtidal and intertidal areas of Duck Flats (feeding), rocky shorelines of the Outer Mineral Creek Islands (haul-out)	water pollution or petroleum product spills which adversely affect seal or sea lion food sources or directly impact their health

As with other living resources in the Duck Flats area, adverse impacts of an uncontained spill of refined petroleum product on bird species would be substantial because of the susceptibility of birds to petroleum contamination. The protective plumage of shorebirds and waterfowl tends to absorb petroleum products resulting in impaired insulation and eventually hypothermia. Further, when birds are engaged in preening activities, they are poisoned by oil ingested. Seabirds exposed to oil suffer a variety of problems including: aspiration pneumonia, starvation, oil toxicity, dehydration, impairment of liver and kidney functions, enteritis, and an increase in the number of parasites because of the stressful condition created by exposure to petroleum products. Such conditions often lead to death. Petro Star's Comparison of Environmental Impacts acknowledged that a spill could impact bird populations to the point of reducing local abundance for more than one generation, stating that affected populations would essentially recover within five years (emphasis added). Table 5 presents the sensitivity of different avian users of the Duck Flats.

The U.S. Fish and Wildlife Service has prepared a resource damage assessment model based on the currently available project (fuel types, vessel and pipeline size) and resource data. The type of model utilized by the Service tends to be conservative and to underestimate damages in areas of high resource value. The model also focused primarily on impacts to birds. The Service believes that additional in-depth analysis of the resources is necessary to provide more accurate results. Nevertheless, for the worst-case scenarios (total loss from the barge or the pipeline) it predicted serious and long-term consequences for the Duck Flats. The model depicted the duration of a catastrophic barge spill's effects to be up to nine years, affecting over 90,000 birds. The results for catastrophic pipeline loss predicted effects on far fewer birds (approximately 500), but depicted up to a seven-year duration of impacts. Although refined products do not cause the highly visible oiling effects of crude, ingestion of refined products through preening or feeding can cause substantial problems, such as anemia and liver damage.

Marine mammals could also experience direct and food-related impacts, resulting in minor to moderate population impacts for one or more generations, although the integrity of the regional population would not be significantly affected. Sea otters are especially vulnerable to the detrimental effects of an oil spill because they rely on fur for thermal insulation and feed at the surface of the water. Sea otters exposed to oil frequently suffer from hypothermia, hypoglycemia, emphysema, and petroleum hydrocarbon toxicosis. The District acknowledged in their Decision Document, that direct contact of marine mammals with petroleum products could be fatal and that chronic long term contamination of the area with hydrocarbons from frequent, small spills could have negative impacts on their health as well as their food source. The sensitivities of marine mammals is also summarized in Table 5.

## Compliance with the Section 404(b)(1) Guidelines

The current review and decision regarding issuance or denial of the permit modification request must reflect compliance with the Section 404(b)(1) Guidelines. EPA believes that the Alaska District's decision to issue the permit modification does not reflect EPA and Department of Army policies regarding analysis of alternatives pursuant to Section 230.10(a) of the Guidelines. EPA is concerned by both procedural and substantive deficiencies of the Alaska District's alternatives analysis. Our concern for procedural aspects of the District's review relates both to definition of purpose/scope of alternatives analysis and consideration of mitigation during the review of alternatives. With respect to the substance of the alternatives analysis, EPA believes the record does not show that the District either fully considered the practicability, or appropriately addressed the environmental acceptability of several possible alternative project sites. Based on these concerns regarding the Alaska District's application of the Section 404(b)(1) Guidelines, EPA believes the permit modification does not comply with Section 230.10(a) of the Guidelines.

### Procedural Elements of Alternatives Analysis

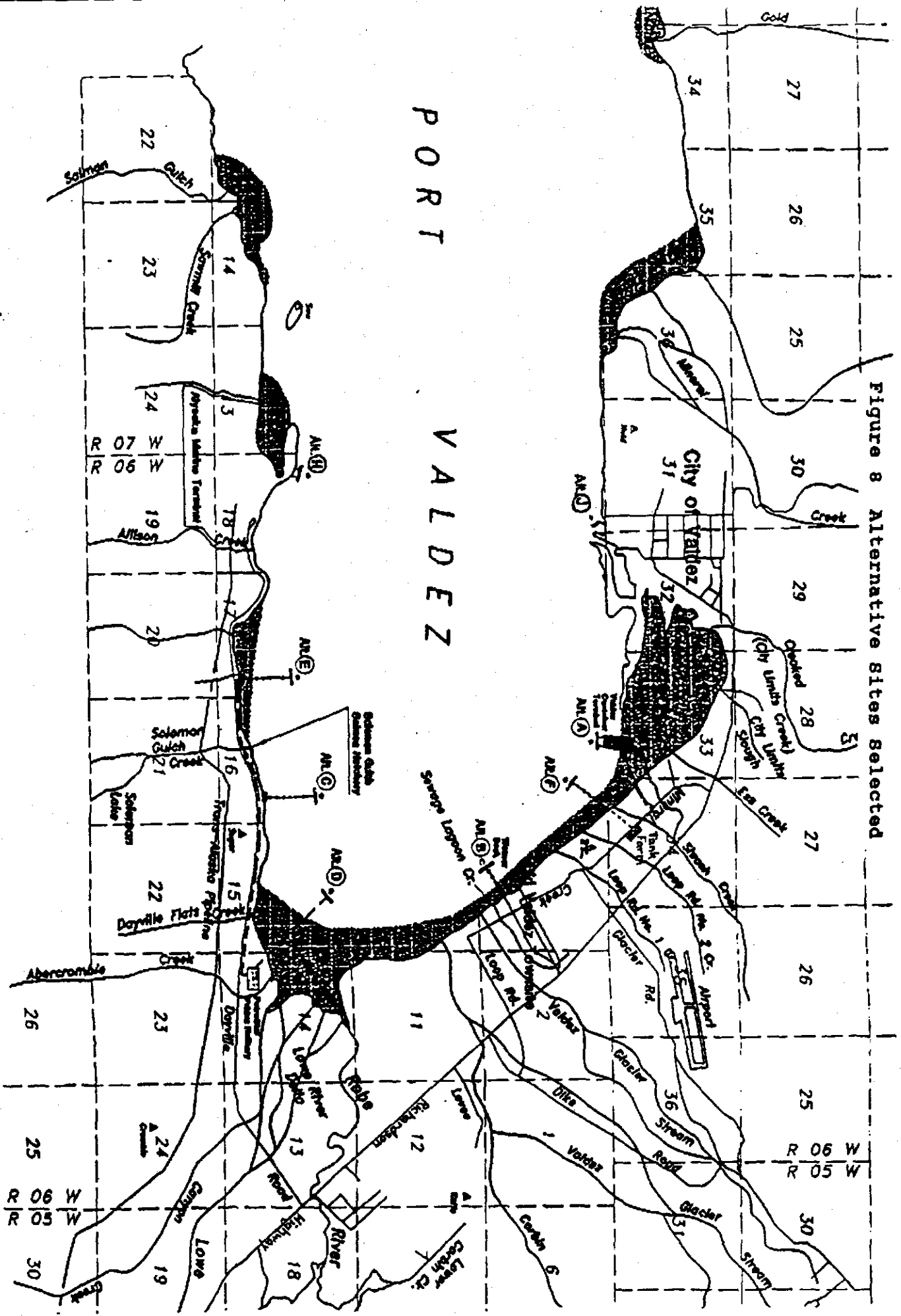
**Purpose and Need/Scope of Alternatives Analysis** EPA has determined that, for the purposes of the Section 404(b)(1) Guidelines review of the permit modification, the Alaska District incorrectly identified the basic purpose for the modification. The District's Decision Document's definition of project purpose inappropriately combines the purpose of the modification from the perspective of the City (i.e., "to generate additional revenue from the [VCT]") with the actual activity that would require Department of Army authorization (i.e., "to transfer refined petroleum from the Petro Star tank farm to a barge loading facility at the end of the [VCT]"). EPA believes the ancillary component of generating additional revenue for the City of Valdez from the VCT inappropriately restricted the scope of review of practicable alternatives. Clearly only one alternative, the one proposed by the applicant, could possibly satisfy this project purpose. A more appropriate definition of the basic purpose of the permit modification is the transport of refined petroleum product from the Petro Star refinery to a transfer point in Port Valdez to facilitate the sale and shipment of that product throughout south-coastal and interior Alaskan markets. Review of alternatives based on this definition would help to ensure that adverse environmental impacts are avoided to the maximum extent practicable as required under the Section 404(b)(1) Guidelines.

EPA is also concerned that the Alaska District appears to have inappropriately considered proposed mitigation during its evaluation and selection of the least damaging alternative under Section 230.10(a) of the Section 404(b)(1) Guidelines. Throughout the discussion of the adverse impacts of the proposed permit modification, the Alaska District's draft Decision Document justifies selection of the VCT alternative based significantly on a discussion of the mitigation factors included in the proposed project. EPA recognizes that mitigation for unavoidable impacts associated with the least

environmentally damaging practicable alternative is appropriate. The decision document, however, indicates that in selecting the least damaging alternative from among the eight alternatives reviewed, the District incorrectly factored into this evaluation mitigation measures proposed to minimize adverse impacts from the preferred VCT alternative. For example, in response to EPA Region X's comments regarding the availability of less damaging alternatives to siting the pipeline on the VCT, the District Decision Document states, "[S]ince EPA originally commented, the applicant and Petro-Star have incorporated substantial mitigative measures that have lessened the potential for damage to the Duck Flats. We have not found a less environmentally damaging alternative for the proposed project." This statement illustrates that the Alaska District inappropriately incorporated consideration of mitigation measures in its conclusions regarding selection of the least environmentally damaging alternative. This approach is in conflict with the requirements of the Section 404(b)(1) Guidelines which require that potential impacts must first be avoided to the maximum extent practicable through evaluation and selection of the least damaging practicable alternative; remaining unavoidable impacts will then be mitigated to the extent appropriate and practicable. Moreover, in light of EPA's position regarding the adequacy of the proposed mitigation measures, this approach does not address resource agency concerns regarding adverse impacts to aquatic resources. Finally, in discussing alternatives to the proposed pipeline, the District cites potential adverse environmental impacts of those alternatives as a basis for rejection. Many of the adverse impacts cited, however, are considerably less harmful to the aquatic environment than the unmitigated impacts associated with the proposed VCT permit modification and are likely to require less mitigation. Based on review of the alternatives analysis presented in the District's draft Decision Document, authorization of the proposed pipeline does not represent the least damaging practicable alternative and, therefore, does not comply with the Section 404(b)(1) Guidelines.

#### Substance of District's Alternatives Analysis

In addition to the previously discussed concerns regarding the Alaska District evaluation of alternatives to the proposed permit modification, EPA believes that the Corps Draft Permit Evaluation and Decision Document do not adequately support the District's rejection of other potentially less damaging alternatives. The District's draft Decision Document considers seven alternative sites besides the VCT where Petro Star could develop a barge loading facility (see Figure 8). The District rejected various alternatives based on a variety of reasons including, 1) potential seismic disturbance and slumping at the proposed site, 2) the lack of impermeable surface of the facility (e.g. wooden dock) and its effect on ability to control pipeline leakage, 3) assumptions regarding State site approval, 4) proximity to the Solomon Gulch salmon hatchery, 5) adverse impacts associated with the placement of fill into a 1/4 acre wetland, 6) accidental discharge in the case of pipeline rupture, and, 7) the need to transport petroleum product by truck along Mineral Creek Road across the Duck Flats area. While we agree that several of these reasons justify rejection of certain alternatives, EPA believes that several reasons are not supported by the record or, when applied to the



Basemap modified from U.S.G.S. Topographic Series 1:63,360, Valdez Quadrangles A-6 & A-7.



proposed VCT pipeline, would preclude issuance of that alternative as environmentally unacceptable.

For example, EPA agrees that trucking of refined product along Mineral Creek Road across the Duck Flats area would result in considerable environmental risk and that seafloor slumping increases the risk of subsea pipeline rupture. It is unclear, however, what information the District used in reaching conclusions regarding State site approval for the east Solomon Gulch alternative and the likelihood that Petro Star could arrange mutually acceptable agreements with either the owners of Tesoro Dock or the operators of the Alyeska Marine Terminal. Finally, EPA believes that the District's conclusions regarding the unacceptability of the environmental impacts of various alternatives, such as accidental product discharge, pipeline rupture and loss of salmon fry also apply to the proposed VCT pipeline and to a much greater degree due to the exceptional aquatic values of the areas that would be impacted by the permit modification.

Of the seven alternatives to the VCT permit modification, EPA's continues to have significant concerns regarding the District's analysis and rejection of four alternative sites EPA considers preferable to the proposed VCT pipeline. These include; 1) the existing facilities at Tesoro Dock, 2) new pile-supported facilities east of Solomon Gulch, 3) new pile-supported facilities west of Solomon Gulch, and, 4) the existing facilities at the Alyeska Terminal. We have provided an outline of our concerns below.

**Tesoro Dock** The Alaska District's Decision Document notes the fact that refined petroleum products from the Petro Star tank farm are currently being shipped from the Tesoro dock through a "mutually beneficial business arrangement," but dismisses the Tesoro Dock alternative, in part, through reference to the competitive relationship between the two companies. The District asserts that, for competitive reasons, Tesoro will not allow Petro Star to fully operate from their dock. The discussion does not include any information to support the District's determination regarding the ability to reach a mutually acceptable arrangement that would allow continued use of the Tesoro facility. Further information supporting the District's conclusions would seem particularly germane since (1) the two companies, as previously noted, have already achieved a certain level of cooperation; and (2) Tesoro's Nikiski operation required three-way sharing with competitors Phillips and Chevron prior to Chevron's closing of its Nikiski operation.

The Decision Document also discusses the need for Petro Star to truck its products across the Duck Flats and through the City to the Tesoro Dock, finding that this activity would have the potential to adversely impact, through accident hazards, both the environmental values of the Duck Flats and human safety. EPA concurs with this concern and believes that the District should have considered alternatives to trucking, including a pipeline, in its analysis.

Without more complete information regarding the District's conclusions associated with the practicability and environmental acceptability of the Tesoro alternative, EPA believes rejection of this alternative is premature and inappropriate.

**East of Solomon Gulch** EPA has several concerns with the District's assessment of the East of Solomon Gulch alternative and believes this alternative may have been inappropriately dismissed. The District asserts that this alternative would be more likely to experience a spill, because the facility would be pile-supported and therefore both unable to contain a spill on the surface of the facility (unlike the VCT) and more susceptible to geophysical forces, including seismic disturbances. The District concludes, without detailed analysis, that these conditions would result in an increased potential for adverse impacts associated with a spill and is environmentally unacceptable.

In determining the practicability of this alternative, the draft Decision Document also cites the State's designation of this area of Port Valdez as commercial fishing and/or fish habitat. The Document speculates that, although the State may permit other uses, it would "probably" not allow the desired barge loading facility, allegedly because it could interfere with fishing and because of the possible impacts to salmon fry in the net pens of the Solomon Gulch Hatchery, located approximately one mile to the west. In regard to the State's views of this alternative, the draft Decision Document provides no information about the implications of the State's designation of the area, nor what type of State approval would be required in light of the designation. It also fails to note whether Petro Star has pursued approval or, if so, what decision the State rendered.

With regard to impacts to the Solomon Gulch Hatchery, the District states that the potential for a spill to impact hatchery salmon fry represents an unacceptable environmental risk when compared to other alternatives. This assessment and comparison with the proposed permit modification is not supported by available information and does not appear to consider (1) the fact that the prevailing counter-clockwise circulation pattern in Port Valdez would act to carry a spill away from the hatchery; (2) the fact that the fry released from the hatchery complete their rearing in the Duck Flats; (3) the balance between the relative value of an artificially-created salmon run versus naturally existing ones; or, (4) the fact that the three expert fisheries resources agencies--the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and the Alaska Department of Fish and Game--have endorsed this alternative as being less damaging than the VCT permit modification.

The draft Decision Document also concludes that this alternative would require the filling of approximately one quarter of an acre of wetlands for a parking area. The document does not provide a discussion of the environmental values of this wetland or assess the feasibility of avoiding the fill altogether. EPA believes that this aspect of the rejection of the East of Solomon Gulch alternative is not supported by the record. In conclusion, we believe the contributions to this site's rejection made by spill potential,

geophysical hazards, State designation, fisheries impacts and wetlands fill to be both vague and unsupported by the record.

**West of Solomon Gulch** The Decision Document contains virtually no site-specific details concerning possible construction of a facility west of Solomon Gulch. The document dismisses this pile-supported alternative based on its similarities to the site east of Solomon Gulch. As such, the concerns we raised above apply to this analysis as well.

Because the City owns a large tract of land west of Solomon Gulch, immediately east of the Alyeska Terminal, this alternative includes the added attraction of fulfilling both the purpose of the permit modification and the City's desire to generate additional revenue. It should be noted that the Valdez Coastal Management Program identifies this parcel as having been selected by the City for petroleum-related industrial development, emphasizing that development is not only a preferred use of the site, but also a high priority for it. It is unclear whether or not the District considered this factor, but we believe this alternative deserves further exploration. Although this site would be located "up-stream" from the Solomon Gulch Hatchery, an analysis of the measures the Alyeska Terminal has implemented to protect the hatchery, especially in light of the other factors regarding the hatchery which we discussed above, could indicate whether or not this site is environmentally acceptable.

**Alyeska Marine Terminal** The draft Decision Document concludes that the use of the existing Alyeska Marine Terminal is not considered practicable in the foreseeable future. This conclusion is based on Alyeska's indication that acceptance of this alternative would involve engineering, environmental, legal and business analyses and would constitute an operational change requiring further regulatory review as well as approval by the owner companies. EPA disagrees with the District's conclusion that the analyses and approvals cited by Alyeska would be sufficiently burdensome to render this alternative not practicable. EPA believes that each of the analyses noted by Alyeska are not uncommon to standard business agreements. Furthermore, EPA strongly disagrees that a requirement for further regulatory review alters the practicability of a given alternative. With regard to the approval by Alyeska co-owners of a proposed agreement, there is not sufficient information in the document to justify a conclusion that such approval could not be obtained. Finally, EPA believes it is important to note, however, that even though Alyeska cited these factors, the District draft Decision Document states that Alyeska recognizes they would nevertheless consider use of their loading berths for loading Petro-Star's refined petroleum product for shipment. EPA believes the Alaska District inappropriately rejected the use of the existing Alyeska Marine Terminal as an alternative to the proposed permit modification and supports reconsideration of this alternative based on the following discussion.

Built as a joint venture between the seven oil companies operating on Alaska's North Slope, the Alyeska Marine Terminal is located approximately 4.5 miles west of the Petro Star Refinery. EPA agrees with the District's finding that since the Alyeska facility already exists, is located close to the refinery and enjoys a favorable location for transport vessel access, the alternative of siting Petro Star's operation at the Alyeska is very attractive. Additionally, it is EPA's contention that the risk of this alternative to adversely effect aquatic resources of national importance is considerably less than that of the proposed permit modification. The location of the Alyeska Marine Terminal is an important factor in reducing this risk factor. It is recognized that there are several anadromous fish streams to the east of the Alyeska Terminal that are important for salmon spawning. These streams are located generally removed from the vicinity of the Alyeska terminal and it is assumed that even with the prevailing circulation pattern, by the time a spill of refined petroleum products reaches many of these streams, the amount of spilled product will have been substantially decreased through dilution and evaporation. Also, streams on the south side of Port Valdez, although valuable, do not exhibit the extraordinary aquatic values associated with the Duck Flats area. This conclusion is confirmed by data in Petro Star's Comparison of Environmental Impacts study which indicates that average salmon escapement figures for Duck Flats are significantly higher than those of the southern Port Valdez streams.

### Conclusion

Based on the magnitude of adverse environmental impacts of the proposed permit modification on the diverse and valuable aquatic resources in the Duck Flats area and the availability of less damaging alternatives which satisfy the basic purpose of the proposed modification, EPA has determined that the permit modification should be denied. The proposed permit modification would have significant and unacceptable adverse effects on important commercial and recreational fisheries, wildlife, special aquatic sites, life stages of aquatic life and other wildlife dependent on aquatic ecosystems, loss of fish and wildlife habitat for many generations, and support for aquatic life and other wildlife dependent on aquatic ecosystem diversity, productivity and stability. Additionally, the conclusions reached by the Alaska District regarding the effectiveness of preventative and response mitigation measures are not supported by the record in this case.

EPA believes that, in conducting the analysis of alternatives as required under the Section 404(b)(1) Guidelines, the Alaska District inappropriately considered factors irrelevant to the question of practicability and that their analysis failed to identify available, less damaging alternatives to the permit modification. EPA has determined that alternatives were inappropriately dismissed and that four of these alternatives are practicable and less environmentally damaging. Based on these findings, EPA strongly suggests that the permit modification to authorize the installation of a pipeline on the Valdez Container Terminal causeway and terminal loading facility to transfer and dispense refined petroleum products be denied and alternatives methods of achieving the

purpose of the permit modification be more thoroughly explored. As stated in this enclosure, EPA believes that less damaging alternatives are indeed available and currently considers the Alyeska Marine Terminal the preferable alternative.