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NAVIGATION IMPROVEMENTS
LIMITED REEVALUATION REPORT
SAND POINT, ALASKA

March 2004

SUMMARY

This report reevaluates and updates the economic analyses of the authorized Federal project at Sand Point, Alaska. The authorized project was a result of findings from the *Final Interim Feasibility Report* of navigation improvements at Sand Point, dated April 1998. The project was authorized by Section 101 (a)(2) of the Water Resources Development Act of 1999 in accordance with the Chief of Engineers Report, dated October 13, 1998. OMB review and approval of the project was received July 1999. This reevaluation was required since the latest approved economic analyses were more than three fiscal years old.

The community of Sand Point lies on the Pacific coast of the southwestern Alaska Peninsula, in one of the State's most productive fishing areas. Supporting information shows that the groundfish fleet has remained relatively the same size with demand for moorage in the harbor at its peak in October through December. The existing Federal harbor project provides protected moorage for 144 vessels less than 80 feet in length. There is no permanent moorage at Sand Point for vessels greater than 80 feet in length. Extensive rafting is necessary to accommodate these larger vessels due to the lack of moorage. Resident and transient vessels are subject to damages while tying-up and rafting in addition to increased travel to distant ports to seek moorage. Vessels are still being turned away from the Sand Point harbor (Humboldt Harbor) with King Cove, Dutch Harbor, and Kodiak being used as alternate harbors for moorage. When space is not available at any of these harbors, vessels have to travel to ports in the Pacific Northwest.

The National Economic Development (NED) benefit derived from navigation improvements at Sand Point for the 1998 feasibility report was $1,739,000. Based on the findings of this reevaluation, the total NED benefit was revised to $2,057,000. This change is primarily attributed to increased vessel operating costs due to an increase in fuel costs. The conclusions and recommendations of this report remain unchanged from the feasibility report. The recommended plan consists of 570- and 730-foot rubblemound breakwaters, which enclose an 8.6-acre mooring basin and maneuvering area, and a 3-acre entrance channel area. It would provide permanent, protected moorage for 37 commercial fishing vessels ranging in length from 80 to 150 feet. The features of the project that contribute to the NED have a construction cost of $13,155,000 (October 2003 price level), which includes $9,000 for navigation aids. This construction cost also includes $500,000, which was expended to date in preparation of plans and specifications, and this report. This cost was included in the overall project cost to determine the cost sharing but was excluded from NED investment cost and benefit/cost ratio. The annual NED investment cost is $866,000 with a benefit/cost ratio of 2.4 and annual net benefits of $1,191,000.

The local sponsor, the Aleutian East Borough (AEB), would be required to pay the non-federal share of the costs of construction of general navigation features as specified by Section 101 of the Water Resources Development Act of 1986 (Public Law 99-662). This amount is estimated to be $1,842,000. AEB must also pay the entire cost of the local service facilities, including mooring basin dredging, float system, and other local features. The estimated cost of these features is $3,490,000. The total non-federal share of all costs of the project is $5,407,000, which includes the cost of $75,000 for GNF LERR acquisition. The Federal share of project costs is currently estimated at $7,748,000, which includes the cost for navigational aids. It is recommended that the harbor be constructed with Federal participation. The fully funded cost estimate is $13,572,000.

PERTINENT DATA

Authorized Project and Current Recommended Plan

	Authorized Project[a] (Oct 1998 Price Level)	Current Estimate[b] (Oct 2003 Price Level)	Difference	Reason for Difference
NED Benefit Category				
Travel Related	$1,700,000	$2,004,500	$304,500	Note 1
Rafting Damages	$39,000	$52,500	$13,500	Note 2
Total NED Benefits	$1,739,000	$2,057,000	$318,000	
Project Cost				
General Navigation Features (GNF)				
Mob and Demob	$594,000	$657,000	$63,000	Note 3
PED (includes sunk cost of $500,000)	$1,050,000	$1,161,000	$111,000	Note 3
Construction Management	$779,000	$861,000	$82,000	Note 3
LERR—GNF Fed Admin	$5,000	$6,000	$1,000	Note 3
Breakwater and Seawalls	$4,834,000	$5,343,000	$509,000	Note 4
Entrance & Maneuvering Basin	$1,253,000	$1,423,000	$170,000	Note 5
Eider Mitigation	0	$130,000	$130,000	
GNF Subtotal	8,515,000	9,581,000	$1,066,000	
Aids to Navigation	$8,000	$9,000	$1,000	Note 5
LERR—GNF Credit	$72,000	$75,000	$3,000	Note 5
Local Service Facilities				
Mooring Basin and Inner Harbor	3,115,000	$3,434,000	$319,000	Note 5
LERR—LSF	$50,000	$56,000	$6,000	Note 3
LSF Subtotal	$3,165,000	$3,490,000	$325,000	
Total Project Cost (includes sunk cost)	$11,760,000	$13,155,000	$1,395,000	
NED Investment Cost (includes IDC)	$12,178,000	$13,402,000	$1,224,000	Note 7
Annual NED Investment Cost	$896,000	$835,000	($61,000)	Note 6
Annual O&M Cost	$28,000	$31,000	$3,000	Note 3
Total Annual NED Investment Cost	$924,000	$866,000	($58,000)	Note 6
Net NED Benefits	$815,000	$1,191,000	$376,000	
Benefit/Cost Ratio	1.9	2.4	0.5	

[a]Costs provided in Section 101 (a)(2) WRDA 99 in accordance with the Chief of Engineers Report, dated October 13, 1998.

[b]LRR, November 2003: (1) October 2003 price level; (2) 50-year project life; (3) 5-7/8% interest—latest approved Federal reduction rate at the time of report preparation.

Note 1 (Travel Related and Vessel Operating Costs). The hourly operating costs increased ($55/hr to $73/hr) due to an increase in the price of fuel ($1.10/gal to $1.45/gal). The maintenance and stores hourly operating cost also increased from $25/hr to $31/hr, which was increased through the review and verification of the data by Trident Seafoods. The total hourly operating cost was increased from $80/hr to $104/hr.

Note 2 (Rafting Damages). Estimated annual damages were revised to $30,000 with half of that cost due to rafting. Because 50% of rafting damages is alleviated with the project in place, $7,500 would be the benefit. The previous benefit to the project was $3,000 ($19,000 x 35% x 40%). The additional benefit for rafting damages is $4,500 ($7,500–$3,000). It is also assumed that 50% of damages to vessels would be alleviated with the project in place compared to the previous 40%. The additional rafting benefit of $9,000 is from the difference of percentages (40% to 50%) for vessel damages to be alleviated with the project in place ($45,000–$36,000).

Note 3 (Mob/Demob, LERR, PED, and S&A). Costs were updated using cost indexes from EM 1110-2-1304. The composite index weighted average was used for these costs since an identifying feature code was not available.

Note 4 (Breakwater and Seawalls). The breakwater and seawall feature code was used to update this cost.

Note 5 (Local Service Facilities). The navigation ports and harbors feature code was used to update this cost.

Note 6 (Annual NED Investment Cost). Even though the overall cost of the project increased, the interest of 5-7/8% versus the original 7-1/8% resulted in a lower annual cost.

Note 7 (PED). The investment cost and BCR exclude the $500,000 expended to date for PED, which is a sunk cost.

Recommended Plan

Basin		Breakwater	
Area	8.6 ac	Design wave	6.6 ft
Basin depth	-17 ft MLLW	Length, total	1,300 ft
Entrance channel depth	-18 ft MLLW	Crest elevation	16 ft MLLW
Dredging volume		Crest width	7.5 ft
Entrance channel	44,300 yd^3	Rock volume	
Maneuvering basin	3,500 yd^3	Primary armor	29,100 yd^3
Mooring basin	31,000 yd^3	Secondary (B) rock	21,300 yd^3
Total	78,800 yd^3	Core rock	74,100 yd^3
		Entrance channel slope armor	2,800 yd^3

Project Cost[a]

Item	Federal ($)	Non-federal ($)	Total ($)
General Navigation Features[b]	7,339,000	1,742,000	9,081,000
Local Service Facilities	—	3,490,000	3,490,000
LERR (GNF)	—	75,000	75,000
Navigation aids - U.S. Coast Guard	9,000	—	9,000
NED Project Cost	7,348,000	5,307,000	12,655,000
NED investment cost (includes IDC)			13,402,000
Annualized initial cost plus IDC			835,000
Annual NED maintenance cost			31,000
Total average annual NED cost			866,000
Average annual NED benefits			2,057,000
Net annual NED benefits			1,191,000
Benefit/cost ratio			2.4

[a]Basic assumptions: (1) October 2003 price level; (2) 50-year project life; (3) 5-7/8% interest—latest approved Federal reduction rate at the time of report preparation.

[b]Cost sharing reflects provisions of the Water Resources Development Act of 1986—non-federal initial share 10% of GNF plus reimbursement of 10% GNF minus LERR credit.

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CONVERSION TABLE FOR SI (METRIC) UNITS

Units of measurement used in this report can be converted to SI (metric) units as follows:

Multiply	By	To obtain
cubic yards	0.7646	cubic meters
Acre	0.4049	hectare
Fahrenheit degrees	*	Celsius degrees
Feet	0.3048	meters
feet per second	0.3048	meters per second
Inches	2.5400	centimeters
knots (international)	0.5144	meters per second
miles (U.S. statute)	1.6093	kilometers
miles (nautical)	1.8520	kilometers
miles per hour	1.6093	kilometers per hour
pounds (mass)	0.4536	kilograms

*To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: C = (5/9)(F–32).

1.0 INTRODUCTION

1.1 Study Authority

This study is in partial response to the Rivers and Harbors in Alaska study resolution, adopted by the U.S. House of Representatives Committee on Public Works on December 2, 1970. The resolution states in part:

Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Rivers and Harbors in Alaska, published as House Document Numbered 414, 83d Congress, 2d Session; . . . and other pertinent reports, with a view to determine whether any modifications of the recommendations contained therein are advisable at the present time.

The project was authorized for construction in Section 101 (a)(2) of the Water Resources Development Act of 1999 in accordance with the Chief of Engineers Report, dated October 13, 1998 (Appendix B). The Office of Management and Budget has also reviewed and approved the project (Appendix B). The project, as currently authorized, provides navigation improvements at a total cost of $11,760,000 with an estimated Federal cost of $6,964,000 and an estimated non-federal cost of $4,796,000. This reevaluation was required per Engineer Regulation 1105-2-100, which requires that economic analyses of an authorized project are updated every three fiscal years.

1.2 Scope of Reevaluation Study

This study reevaluates and updates the economic analyses conducted during the feasibility study and selection of the recommended plan. Reformulation of project alternatives was not included in this study. The location of Sand Point is shown on figure 1.

1.3 Study Participation

The Alaska District, Corps of Engineers, has primary responsibility for this study. The report was prepared with assistance from many individuals and agencies, including the city of Sand Point and the Aleutians East Borough (AEB).

1.4 Related Reports and Studies

The following studies have examined navigation improvements at Sand Point.

- A study report, dated June 1970, from the Chief of Engineers, Department of the Army, recommended the construction of two rubblemound breakwaters, diversion dike, and diversion channel to protect a 16.6-acre mooring basin.
- The General Design Memorandum No. 1 (Phase I and Phase II), prepared in October 1973, proposed the construction of the present harbor facility.
- Environmental Impact Report (EIR) was prepared in October 1974. The report concluded the harbor project would result in reduced boat damages, and have insignificant and mitigable adverse impacts.

- A reconnaissance report of Sand Point harbor, prepared in April 1986, presented various harbor improvement alternatives to increase the mooring capacity.
- The Corps', Alaska District, contracted with Noble Consultants to screen harbor development plans at Sand Point and to prepare a report titled "Final Report Coastal Engineering, Analysis for Sand Point Harbor Design Studies, Sand Point, Alaska." The report was dated October 7, 1994.
- The Aleutians East Borough contracted with Northern Economics, in association with Ogden Beeman & Associates, Inc. and ResourcEcon, to evaluate the potential annual benefits associated with developing or expanding harbors at Akutan, King Cove, and Sand Point. A March 1995 report describes the results of their study.

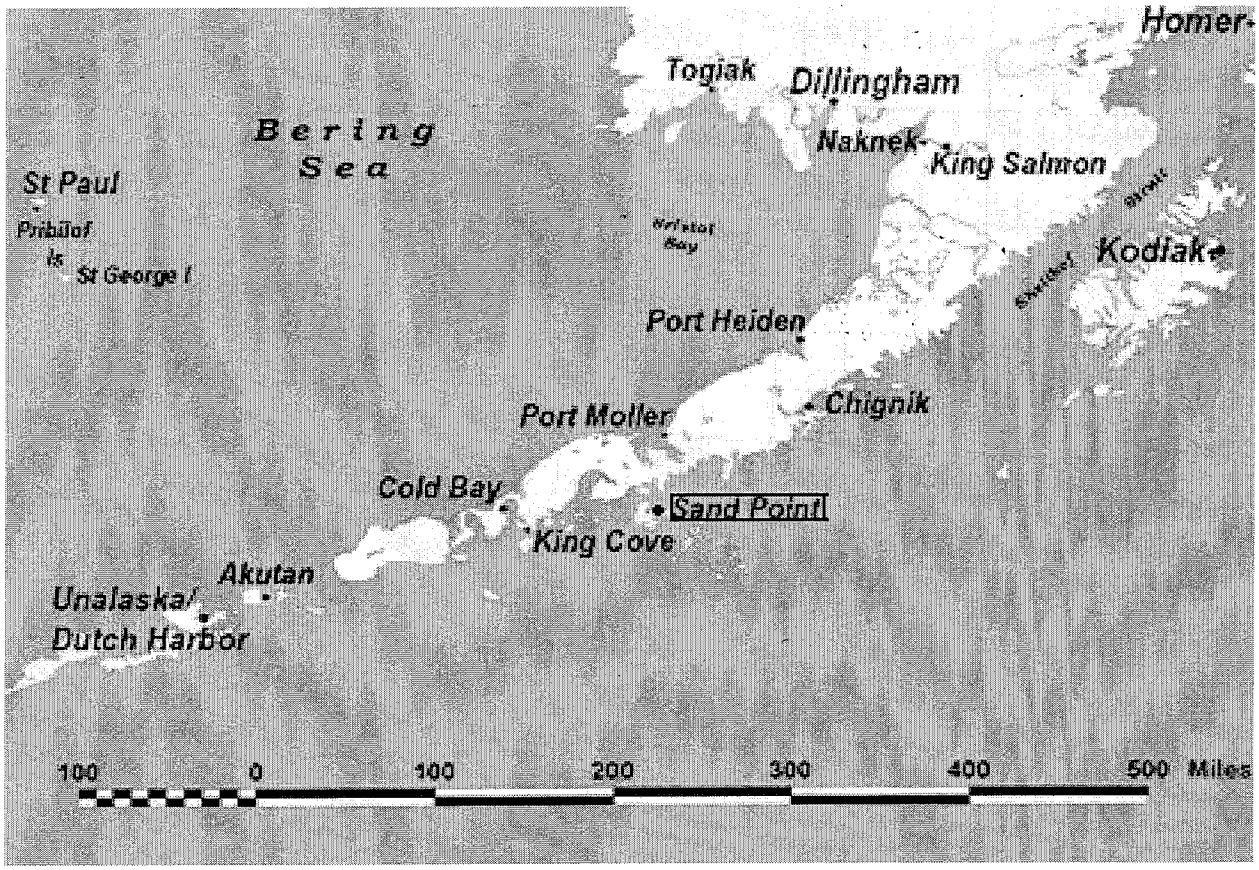

Figure 1. Location Map

2.0 EXISTING FEDERAL PROJECT

The Corps of Engineers constructed Humboldt Harbor at Sand Point in 1976. The harbor consists of a north breakwater 1,500 feet long, a south breakwater 1,000 feet long, and an entrance channel 18 feet deep at mean lower low water (MLLW). The breakwaters create a 16-acre mooring basin. Figure 2 shows the general layout of Humboldt Harbor.

The existing mooring area consists of 144 slips for vessels up to 65 feet, 1,400 feet of floating dock to which transient boats can side-tie, and 750 feet of steel bulkhead for transient vessels. Five steel and timber-pile dolphins, near the north breakwater, are used by larger floating processors and commercial barges. The harbor has a servicing dock with a 42 by 105-foot working area for loading and offloading containers and cargo. The city widened and extended the south breakwater and constructed a 62 by 200-foot dock on the seaward side of the breakwater in a water depth of –30 feet MLLW.

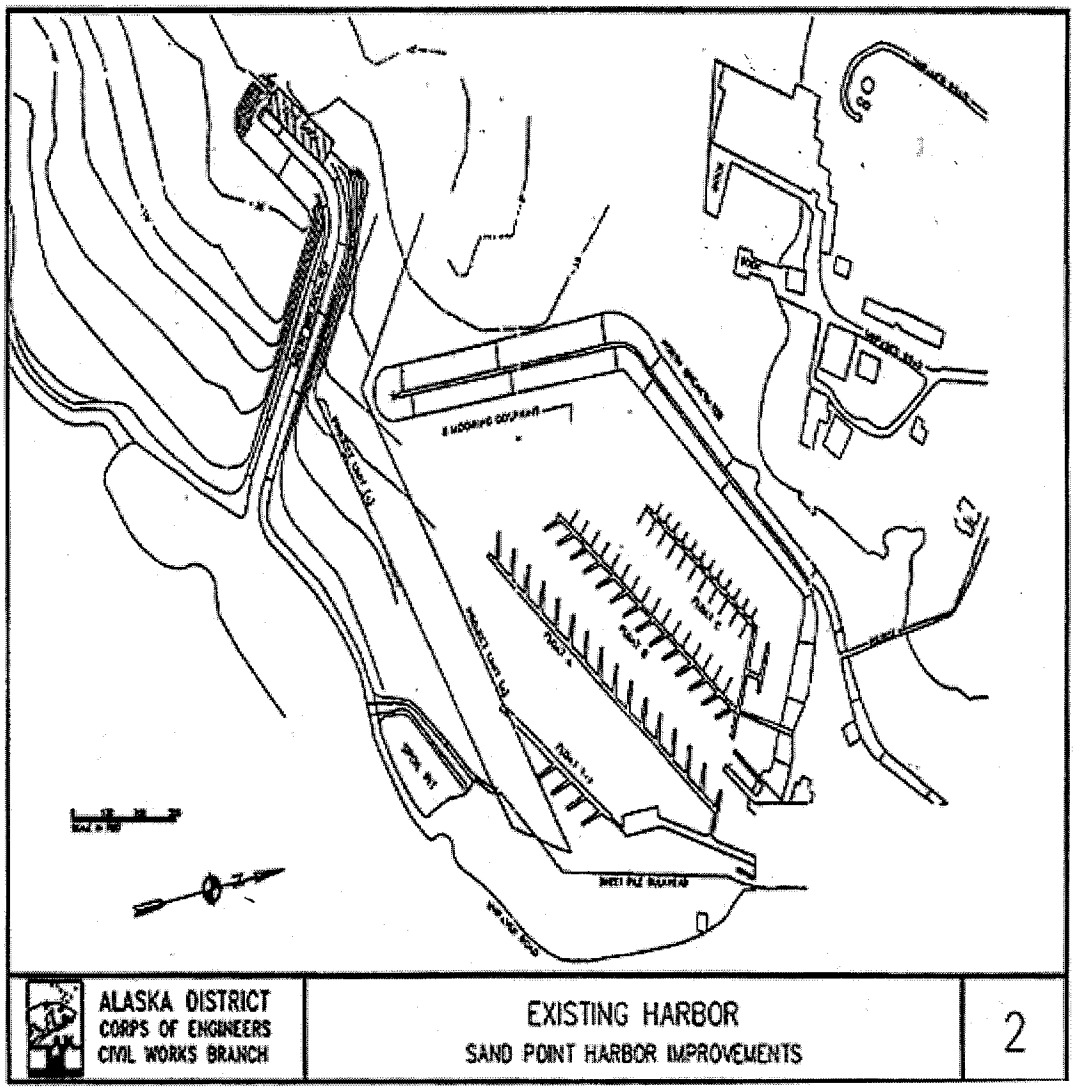

Figure 2. Existing Federal Project

3.0 AUTHORIZED PROJECT

3.1 Authorized Project

The authorized project[1], shown on figure 3, provides a 570-foot-long rubblemound breakwater, extended from the south breakwater of the existing harbor to form the northwest side of the harbor and the eastern side of the entrance channel. Maximum depth of water is –35 feet MLLW along the alignment of the breakwater. A 730-foot-long breakwater would be constructed from shore, extending northwest to a depth of approximately –15 feet MLLW, where it would change to a north-south alignment to form the western side of the entrance channel.

The entrance channel is designed to accommodate one-way traffic for a vessel 150 feet long with a beam of 34 feet, and an unloaded draft of 11.5 feet. The entrance channel has a minimum bottom width of 120 feet with additional width in the channel turn increasing to 230 feet. The area of the entrance channel is approximately 2.9 acres. Dredging of 44,300 yd^3 in the entrance channel is required to obtain a depth of –18 feet MLLW throughout. A new harbor would be created south of the existing harbor, providing 37 slips for vessels 80 to 150 feet in length.

Table 1. Total Cost for Authorized Project

Item	NED Plan ($)
General Navigation Features	8,515,000
Aids to navigation	8,000
Local Service Facilities[a]	3,237,000
Final initial cost rrequirements	11,760,000

[a] This includes the LERR-GNF Credit of $72,000

Details of the economic benefits of the navigation improvements at Sand Point can be found in appendix B of the feasibility report.

Table 2. Summary of Annual NED Benefits

Benefit Category	Annual Benefit ($)
Travel related benefits	1,700,000
Rafting related benefits	39,000
Total annual benefits	1,739,000

[1] References the Report of the Chief Engineers, Department of the Army, October 1998 at Sand Point.

3.2 Planning Objectives

Planning objectives from the feasibility study are as follows:

- Provide protected moorage for large (>80 foot) commercial vessels.
- Reduce travel cost associated with seeking moorage at distant ports.
- Reduce lost opportunity costs and improve the local economy by providing vessel availability on a year-round basis for vessels in excess of 80 feet, including short-term vessel use during adverse weather.
- Reduce harbor and vessel damages due to excessive rafting at the existing Sand Point harbor. This object was not explicitly stated in the feasibility report but was inherent in the study process.
- Provide a harbor of refuge for transient vessels.
- Avoid, minimize, and mitigate environmental resources to the maximum level consistent with maximizing NED net benefits and other objectives.

3.3 Environmental Considerations

An Environmental Assessment was prepared during the feasibility study and a Finding of No Significant Impact was signed on April 24, 1998. The assessment concluded that the Sand Point navigation improvements could be constructed with no significant effect on the quality of the environment. The project is consistent with state and AEB coastal management programs to the maximum extent practical.

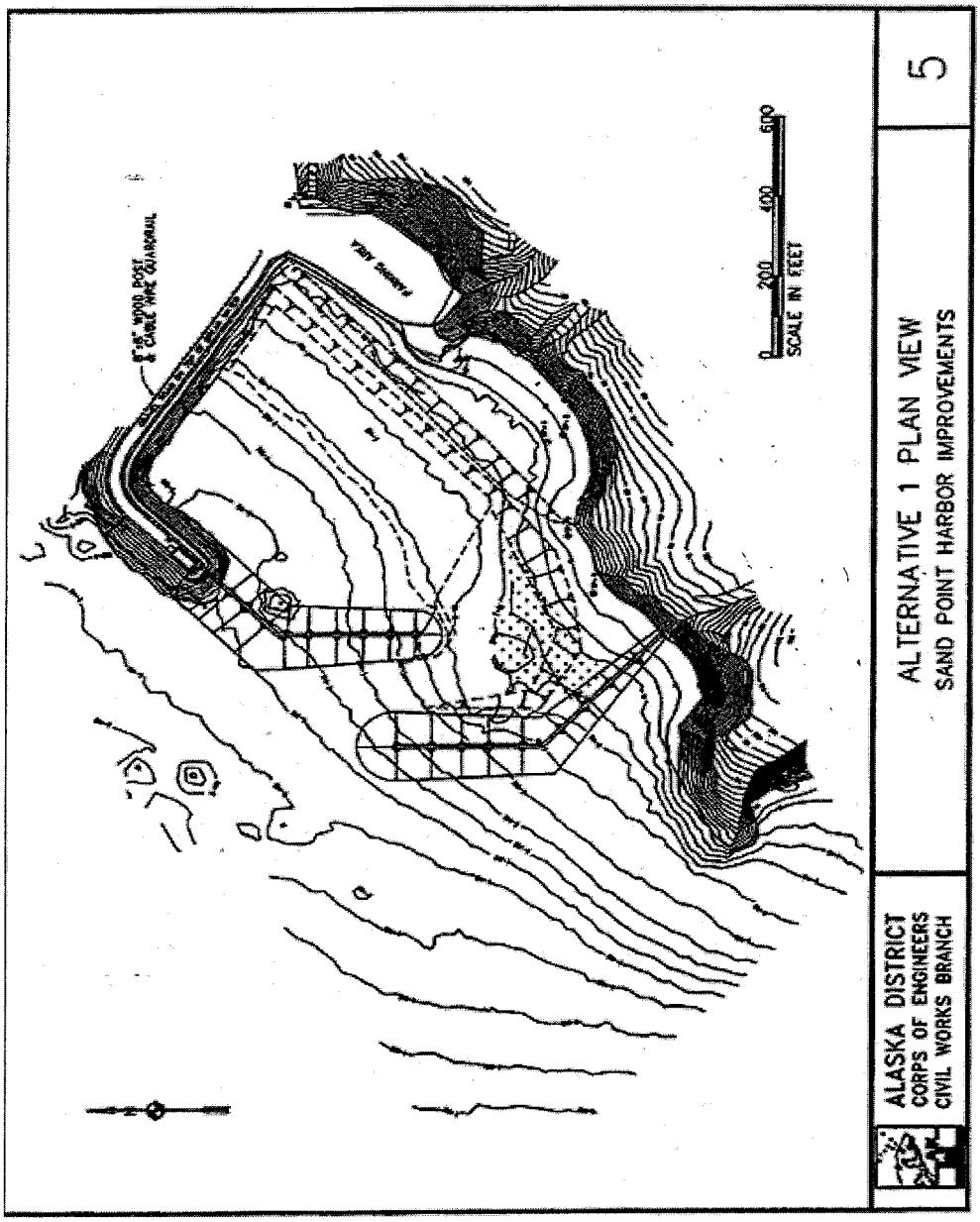

Figure 3. Authorized Project

4.0 ECONOMIC REEVALUATION OF AUTHORIZED PROJECT

4.1 Existing Harbor Fleet

Humboldt Harbor's capacity has not changed since the 1998 Feasibility Report and Environmental Assessment. There are 144 mooring spaces in the harbor. The 144 existing permanent slips in Humboldt Harbor are sized entirely for vessels up to 65 feet in length. The harbor has 1,400 feet of floating dock, and 750 feet of sheetpile bulkhead are also available for side tying of transient vessels. Vessels over 65 feet in length must use the transient vessel moorage. The moorage capability is shown in table 3.

Table 3. Existing Permanent Moorage Slips at Sand Point

Vessel Size (ft)	Number of Sips
22–30	24
31–40	54
41–50	28
51–65	38
Total Vessels	144

October through December is when the harbor is at its peak capacity for vessels over 80 feet being rafted together in order to moor in the harbor.

Table 4 provides a breakdown of the average number of vessels moored in Humboldt Harbor from 1996 to 2001. The harbor is only designed for 8 large vessels, but the table shows that the average usage is double the design capacity at its peak, causing vessel and dock damages from rafting.

Table 4. Average Moorage (>80 ft) for Humboldt Harbor 1996–2001

Month	Average Number of Vessels	Average Days Moored
January	12.25	8.00
February	3.75	5.50
March	4.75	7.00
April	8.40	16.60
May	11.00	19.17
June	12.00	14.00
July	10.00	7.75
August	13.20	16.20
September	9.40	19.00
October	16.00	14.83
November	16.17	23.50
December	15.40	30.60

4.2 Moorage Demand

The total moorage demand at Sand Point is comprised of vessel owners seeking permanent moorage as well as those seeking transient moorage. The 1998 report determined that demand for moorage by vessels over 80 feet in length exceeded the available supply of space by 63 vessels. Of this total, 21 vessels wanted permanent space and 42 were seeking transient

moorage. Interviews with fishers, processors, and harbor personnel indicated that the tenders and pot vessels represented the majority of vessels requiring moorage, both permanent and transient. These larger vessels are engaged in the groundfish fisheries while the smaller vessels are engaged in the salmon fisheries. Several sources, including harbor logs, Commercial Fisheries Entry Commission (CFEC) databases, and Alaska Department of Fish and Game (ADF&G) data, were reviewed to determine the trends in the regional fleet size. These sources indicate that the numbers of vessels in the local groundfish fleet is expected to remain relatively stable, so it can be anticipated that the future demand for the harbor will be similar to demand in recent years.

A recent review of harbor logs identified 78 unique vessels over 80 feet that use the Sand Point harbor for transient moorage, which is consistent with the data from the 1998 report. CFEC databases of vessel characteristics show that the number of pot and trawl vessels, engaged in the ground fisheries, have fallen slightly from 118 vessels in 1996 to 109 vessels in 2001.[1]

A look at the number of permits issued and fished for the groundfish industry in the Aleutian Islands and Bering Sea region shows that the number of permits has decreased slightly from the 1996–2001 period. This data is shown in table 5. The 7 percent drop in permits issued represents a total of 9 permits, a decrease from 131 to 122, which represents only a small change in the groundfish industry. Although the number of permits fished is down for the Aleutian Islands/Bering Sea region, the numbers of fishing vessels dropping off their catch in Sand Point is up. This may be due to the decline of the salmon harvest in the Sand Point area and a number of vessels crews choosing to concentrate on groundfish.

Table 5. Vessels Participating, Permits Issued and Fished for Groundfish Industry (Areas 3B And 4A-4E)

Year	Vessels In Commercial Fishery (Pot/Trawl) (Aleutian East)	% Change Previous Year	No. Permits Issued	% Change Previous Year	No. Permits Fished	% Change Previous Year
1996	118		301		131	
1997	117	-1	316	5	144	10
1998	120	3	283	-10	135	-6
1999	120	0	268	-5	123	-9
2000	120	0	264	-2	128	4
2001	109	-9	258	-2	122	-5
		Overall % change 1996–2001				
		-8		-14		-7

Source: ADF&G, Division of Commercial Fisheries, July 17, 2003. Number of permits issued and fished reflect the entire ground fish industry for areas 3B & 4A-E.

Additional data was obtained from the Alaska Department of Fish and Game (ADF&G) and is provided in table 6. This data provided the number of vessels by fishery that unloaded their catch in Sand Point to the processor during 1996–2002.

[1] Data from 1996 is used for reference, because it was the basis of the analysis presented in the 1998 report.

Table 6. Sand Point Unique Vessel Count for Groundfish

Year	Species	Unique Vessel Count*	Aleutian Islands and Bering Sea Harvest (metric tons)	Exvessel Value ($ millions)	No. Permits Issued**	No. Permits Fished**
1996	Pacific Cod	57	240,673	100.76	301	131
1996	Atka Mackerel	10	103,943	12.72	301	131
1996	Walleye Pollock	47	1,129,126	220.56	301	131
1996	Sablefish (Blackcod)	29	1,413	6.00	33	8
Total		143	1,475,155	340.04	334	139
1997	Pacific Cod	98	257,669	119.92	316	144
1997	Atka Mackerel	12	65,845	7.74	316	144
1997	Walleye Pollock	46	1,061,490	226.71	316	144
1997	Sablefish (Blackcod)	18	1,436	10.92	21	8
Total		174	1,386,440	365.29	337	152
1998	Pacific Cod	82	193,251	81.05	283	135
1998	Atka Mackerel	8	55,874	8.04	283	135
1998	Walleye Pollock	36	1,041,113	146.47	283	135
1998	Sablefish (Blackcod)	21	1,099	5.68	8	4
Total		147	1,291,337	241.24	291	139
1999	Pacific Cod	89	162,361	56.72	268	123
1999	Atka Mackerel	20	53,643	5.91	268	123
1999	Walleye Pollock	49	989,655	152.72	268	123
1999	Sablefish (Blackcod)	15	1,211	6.37	11	7
Total		173	1,206,870	221.72	279	130
2000	Pacific Cod	74	177,439	104.82	264	128
2000	Atka Mackerel	No Data	42,440	8.42	264	128
2000	Walleye Pollock	39	1,133,795	153.92	264	128
2000	Sablefish (Blackcod)	10	1,631	8.11	15	10
Total		123	1,355,305	275.27	279	138
2001	Pacific Cod	107	164,204	90.43	258	122
2001	Atka Mackerel	No Data	56,534	1.69	258	122
2001	Walleye Pollock	36	1,387,301	221.90	258	122
2001	Sablefish (Blackcod)	25	1,839	8.06	20	11
Total		168	1,609,878	322.08	278	133
2002	Pacific Cod	135				
2002	Atka Mackerel	6				
2002	Walleye Pollock	44				
2002	Sablefish (Blackcod)	36				
Total		221				

Source: ADF&G, Division of Commercial Fisheries, July 17, 2003.

* The vessel count represents the number of times vessels dropped off their catch at the processor.

**Number of permits issued and fished for Pacific cod, Atka mackerel, and walleye pollock represent the entire groundfish fishery for areas 3B and 4A-E.

Pollock and Pacific cod produces the largest harvests in the Sand Point area. The vessel counts for those fisheries shows, from 1996 to 2002, an increase of 78 groundfish vessels or a 55 percent increase in activity. These counts represent vessels that may be fishing more than one groundfish fishery; nonetheless, the numbers show increases to the groundfish fishery and additional activity for the Sand Point area. Based on the average number of vessels moored, the number of permits fished, and the number of vessels dropping fish off to the local processor from 1996 to 2002, the demand for 37 slips in the expanded harbor is supported. The recent trend in the groundfish fishery also shows consistent catches and a strong future for the industry.

4.3 Marine Resource Assessment

Sand Point has a resident commercial fleet that delivers to the local seafood processor. This resident fleet is comprised of mainly salmon seiner class vessels smaller than 65 feet in length. There are a few larger vessels, greater than 80 feet, owned by residents of Sand Point—the majority of the larger vessel fleet being home ported outside of the community, mainly in Seattle, WA. These larger vessels tend to concentrate on groundfish by trawling for pollock or by pot fishing for cod and crab. Since groundfish are the main reason large vessels moor in Humboldt Harbor, only those fisheries related to groundfish will be updated and discussed.

4.3.1 External Influences To Fisheries

Steller sea lion protection measures, the restructuring of the groundfish fishery in 2001 under the American Fisheries Act (AFA), and farmed salmon production are areas that have impacted the fisheries out of Sand Point. With the implementation of the AFA and the end of the race for fish, the Bering Sea/Aleutian Islands (BSAI) pollock season was lengthened and the rate of harvest and processing reduced. Processing figures seem to support this change because the Sand Point plant processed significantly less BSAI pollock than in the year before as well as significantly less pollock overall. The impact of farmed salmon production on worldwide prices of natural salmon is also a factor in the local areas economy. Steller sea lion measures have impacted fishing seasons and allowed harvests. These issues will be discussed in the following sections.

Steller Sea Lion Protection Measures. In 1998, the National Marine Fisheries Service (NMFS) issued a biological opinion on the pollock and Atka mackerel fisheries that resulted in substantial regulatory changes in the groundfish fisheries. The biological opinion found that BSAI and Gulf of Alaska pollock fisheries jeopardized the existence of the western Steller sea lion population and adversely modified Steller sea lion critical habitat. The finding was based on several factors, all of which related to the competition between the fisheries and Steller sea lions for pollock. The impact of this decision was first felt in the 1999 season when an emergency rule closed the Aleutian Islands subarea, broadened "no trawl" zones, shortened fishing seasons, established new seasonal harvest apportionments, and limited forage areas and trip harvests.

Greenpeace, the American Oceans Campaign, and the Sierra Club filed suit in 1998 alleging that the actions of NMFS to protect the Steller sea lion were inadequate under the Endangered Species Act. On August 7, 2000, an order was granted, enjoining all trawling in

Steller sea lion critical habitat in the Bering Sea, Aleutian Islands, and the Gulf of Alaska, based on a finding that continuing that activity posed an imminent threat to Steller sea lions.

On November 30, 2000, NMFS released a new biological opinion that concluded that the harvesting of the pollock, Pacific cod, and Atka mackerel fisheries in the Bering Sea, Aleutian Islands, and Gulf of Alaska jeopardized the survival of the Steller sea lion and adversely modified sea lion critical habitat. The biological opinion expanded area closures and called for further study of the interactions between fisheries and the Steller sea lion. Before the actions were implemented, the U.S. Congress enacted legislation requiring NMFS to apply any further restrictions on fishing in a gradual manner in order to reduce their negative economic consequences. In addition, the legislation established a $30 million fund to be used to lessen any adverse economic effects that may result from the phased-in restrictions.

American Fisheries Act (AFA). The AFA was implemented in phases, beginning in 1999 and continuing into 2000. In general, the AFA allows the formation of fishing cooperatives and eliminates the "race for fish" in the Bering Sea/Aleutian Islands (BSAI) pollock fishery. Catcher processor cooperatives began in 1999 while mothership inshore cooperatives were allowed in 2000. Under the AFA, harvesters and processors are essentially guaranteed a fixed percentage of the total allowable catch (TAC) for pollock. This guarantee allows these enterprises to time harvests and utilize harvesting vessels in ways that enhance revenues and minimize costs.

In addition to establishing cooperatives, the AFA changed the distribution of BSAI pollock TAC among processing harvesting sectors. Before the AFA the inshore sector was allocated 40 percent of the non-Community Development Quota (CDQ) BSAI TAC for Pollock. The offshore sector, which includes both motherships and catcher processors, was allocated the remaining 60 percent. Under the AFA, 50 percent of the non-CDQ TAC for pollock is allocated to the inshore sector. The AFA also allocated 10 percent of the non-CDQ TAC for pollock to motherships and reserved the remaining 40 percent for pollock catcher processors.

The AFA also required the increased "Americanization" of U.S. fisheries. To continue fishing in the U.S. fisheries, corporations, operating fishing vessels, would have to meet a new standard of 75 percent American ownership instead of the previous standard of 50 percent.

To date, the effects of the AFA appear to have been very positive in term of increasing revenues and profits in the BSAI pollock fishery. Of particular significance to this analysis is the fact that the positive economic effects of the AFA offset to some extent the negative economic impacts of the implementation of more restrictive Steller sea lion measures.

4.3.2 Groundfish

According to the 2001 Sector and Regional Profiles of the North Pacific Groundfish Fisheries, pollock and Pacific cod, respectively, accounted for 69 percent and 29 percent of the groundfish total for Sand Point with fractional percentages of other groundfish species accounting for the rest. The groundfish fishery is vital to the community of Sand Point and has accounted for the largest portion of the groundfish industry in the Alaska Peninsula and Aleutian Islands for total catch value and number of vessels operating, as identified in table 7.

Table 7. Community Rankings by Alaska Groundfish Catcher Vessels Owned by Residents of the Alaska Peninsula and Aleutian Islands Region, 1992–2000

City	Total Value–$ millions (% of region)	No. Vessels (% of region)
Sand Point	59.1	49.0
King Cove	23.8	23.2
Unalaska/Dutch Harbor	14.1	21.2
False Pass	1.1	2.0
Akutan	1.1	3.3
Saint Paul Island	0.4	0.7
Adak	0.4	0.7

Note: Communities are ranked based on each community's percent of the historical value for the region.

Source: Calculated by Northern Economics for Sector and Regional Profiles of the North Pacific Groundfish Fisheries, 2001.

Pollock. Pollock is the dominant groundfish species in the Bering Sea and remains the most important groundfish species to Sand Point with pollock accounting for 69 percent of the total groundfish catch. The catch levels for 1996–2001 are slightly lower than the years 1990–1995 with an average catch of 1.1 million metric tons compared to 1.3 million metric tons for 1990–1995. The pollock harvest in 2001 was back above the averages for previous years at approximately 1.4 million metric tons and appears to be a strong indication for the future. Pollock catches for recent years are shown in table 8.

Table 8. Eastern Bering Sea and Aleutian Island Pollock Catch, 1996–2001

Year	EBS Harvest (metric tons)	AI Harvest (metric tons)	Exvessel Value ($ millions)
Avg. 1990–1995	1,319,666		
1996	1,102,529	26,597	220.56
1997	1,036,769	24,721	226.71
1998	1,019,060	22,053	146.47
1999	988,675	980	152.72
2000	1,132,621	1,174	153.92
2001	1,386,513	788	221.90
Average	1,123,747		

Source: National Marine Fisheries Service (NMFS) June 3, 2003

Pacific Cod. Pacific cod ranks second as the next most important species to pollock in Sand Point with Pacific cod accounting for 29 percent of the total groundfish catch. The average catch from 1996–2001, at approximately 200,000 metric tons, is above the average of 1990–1995 of 169,000 metric tons and appears to be strong for the future. Pacific cod catches for recent years are shown in table 9.

Table 9. Eastern Bering Sea and Aleutian Island Pacific Cod Catch, 1996–2001

Year	EBS and AI Harvest (metric tons)	Exvessel Value ($ millions)
Avg. 1990–1995	169,166	
1996	240,673	100.76
1997	257,669	119.92
1998	193,251	81.05
1999	162,361	56.72
2000	177,439	104.82
2001	164,204	90.43
Average	199,266	

Source: National Marine Fisheries Service (NMFS) June 3, 2003

Atka Mackerel. Atka mackerel catches have been relatively small in comparison to pollock and Pacific cod in recent years. The value of this species has steadily decreased from a high value of $12.72 million in 1996 to a low value of $1.69 million in 2001. The catch levels have remained consistent from 1990–1995 with 52,203 metric tons as an average for those years to 63,047 metric tons for 1996–2001, but recent values of mackerel may influence the groundfish fleet to concentrate on other species. Atka mackerel catches for recent years are shown in table 10.

Table 10. Eastern Bering Sea and Aleutian Island Atka Mackerel Catch (1996–2001)

Year	EBS and AI Harvest (metric tons)	Exvessl Value ($ millions)
Avg. 1990–1995	52,203	
1996	103,943	12.72
1997	65,845	7.74
1998	55,874	8.04
1999	53,643	5.91
2000	42,440	8.42
2001	56,534	1.69
Average	63,047	

Source: National Marine Fisheries Service (NMFS) June 3, 2003

Sablefish (Black Cod). This species tends to be more abundant in the Aleutian Islands region than the Bering Sea and is generally caught as bycatch while targeting other groundfish. The value for sablefish has been high and may be a more attractive alternative than mackerel for some vessels. The catch average from 1996–2001 is 1,438 metric tons, virtually half of the average from 1990–1995, 2,806 metric tons. The outlook for the sablefish fishery is slow. Sablefish catches for recent years are shown in table 11.

Table 11. Eastern Bering Sea and Aleutian Island Sablefish Catch (1996–2001)

Year	EBS Harvest (metric tons)	AI Harvest (metric tons)	Exvessel Value ($ millions)
Avg. 1990–1995	2,806		
1996	648	765	6.00
1997	654	782	10.92
1998	563	536	5.68
1999	646	565	6.37
2000	681	950	8.11
2001	835	1,004	8.06
Average	1,438		

Source: National Marine Fisheries Service (NMFS) June 3, 2003

Other Fish Species and Fisheries. For the purposes of this report, the following species are considered to be insignificant to the Aleutian Islands and Bering Sea region: Pacific Ocean perch, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, flathead sole, Alaska plaice, and 15 species of rockfish. Catches of these species are generally considered to be incidental to other fisheries and will not be discussed further in this report. The herring sac roe, and food and bait fisheries are also considered to be of small importance to the region and will not be further discussed.

4.3.3 Resource Summary

The groundfish fishery in the near future should be relatively stable with Pacific cod and mackerel catches at or above 1990 to 1995 averages. Pollock catches from 1996 to 2001 have been, on average, about 190,000 metric tons below the average of 1990 to 1995 with the pollock catch rebounding in 2001, above normal harvest averages. The pollock fishery appears to be stable for the future and should produce consistently. The Sand Point region relies heavily on the entire groundfish industry to sustain the local economy and should benefit from consistent groundfish harvests.

It appears that the positive economic effects of the AFA have offset to some extent the negative economic impacts of the implementation of the restrictive Steller sea lion protection measures. It is extremely difficult to speculate on the overall impact of one measure versus another on the entire groundfish industry and its relevance to Sand Point. The groundfish industry in particular appears to be in good shape for the near future.

4.4 Existing Conditions

This section examines the commercial fishing activities and modes of operation, as they currently exist for the relevant fleet using the Humboldt Harbor, and any changes since the 1998 report. Vessel operating costs for the average-sized tender/crabber are re-defined, opportunity costs of time are re-calculated for the crew, congestion problems within the existing harbor are discussed, and travel to alternate ports, by vessels unable to secure moorage at Sand Point, is re-examined.

The existing supply of moorage available in Sand Point is not adequate to meet current demand and has not changed since the 1998 report. Surrounding harbors, Dutch Harbor, and Kodiak are operating above their current design capacity. The new expanded King Cove harbor will be completed by winter of 2003. The King Cove harbormaster stated that 40 of

the 50 large vessels slips will be filled with vessels seeking permanent moorage from October through January and anticipates that transient vessels seeking moorage will use most of the available space remaining; the harbor will only be able to accommodate a limited number of additional vessels. Chignik Harbor is toward the end of construction and will be available before the end of the year. Homer Harbor has also been identified as a location where moorage could be available. Recent research has identified a few Aleutian fishing vessels as having briefly moored in the harbor, but sufficient data is not available at this time to show any trends. The harbormaster at Homer stated that the available moorage in the harbor is limited with rarely any space available.

Humboldt Harbor is still over-utilized by larger vessels year-round with overcrowding mainly occurring in the fall and winter months. Vessels are rafted, resulting in excessive strain on the floats and docks, and causing damage. The existing facility was only designed for 8 large vessels. Smaller vessels under 65 feet do not present any kind of overcrowding problem at the harbor. Commercial fishing vessels, both local and transient, are impacted by congestion and lack of adequate moorage. Expanded harbor space for large transients at Sand Point would allow the operators to avoid making unnecessary trips to other harbors during closed fishing periods and off-seasons.

Vessels are still being turned away from Humboldt Harbor. King Cove, Dutch Harbor, Kodiak, and Homer are alternate harbors that these vessels try to find moorage. King Cove is 156 miles round trip from Sand Point and is the closest choice for alternative moorage. King Cove's newly expanded harbor will provide additional moorage for vessels being turned away from Sand Point, but is not a favorite choice because of the weather related conditions in the area. King Cove's location is in a severe weather area, and getting in and out of their airport is difficult at times. Vessel captains repeatedly stated, during interviews, that the weather was a main factor in choosing different harbors and changing out crews in those locations. Dutch Harbor, a 472 mile round trip, was a popular alternative to Sand Point because of better services in the area and the ease of flying in and out of the airport. Kodiak, a 720 mile round trip, is the third alternative for moorage in the area. Homer, a 920 mile round trip, was identified as another alternative for moorage. Three local groundfish vessels were identified that have used the Homer Harbor (two trawlers and one tender), but establishing a creditable figure for vessels that travel to Homer for alternate moorage would be difficult, based on the limited data available and may only reflect a business decision to fish another area for that year. Homer Harbor will not be used to calculate vessel travel costs and benefits for this report, but has been identified for further research on future projects. When space is not available at any of these harbors, vessels have to travel to ports in the Pacific Northwest.

4.4.1 Vessel Operating Costs

The average operating cost of a large transient class vessel, a 100- to 130-foot tender or crabber was chosen as typical for operating within the BSAI area. Vessel operating costs were reviewed and updated as necessary. In two areas adjustments were made to the vessel operating costs: vessel/machinery maintenance and freight costs. Table 12 shows the adjustments made to the Fleet Survey Report vessel operating costs.

Table 12. Updated Vessel Operating Costs for 2003

Item	Vessel Length (<100 ft)	Vessel Length (101–130 ft)	Average
Vessel and machinery maintenance (1998 cost)	$66,203	$113,623	$89,913
Adjustment Factor			20%
Adjusted Maintenance			$107,896
Miscellaneous Expenses	$58,924	$59,340	$59,132
Bait	$15,722	$23,627	$19,675
Food	$11,273	$14,117	$12,695
Other Stores and Supplies	$3,486	$11,737	$7,612
Licenses	$1,963	$2,403	$2,183
Freight (1998 cost)	$1,086	$1,642	$1,364
Adjustment Factor			2
Adjusted Freight			$2,728
Stores Total			$104,025
Variable Operating Cost Total			$211,921

Since most of the vessels fall between 80 to 130 feet, an average was first taken between the two vessel size categories to show a more realistic number that isn't understated or overstated.

Vessel and machinery maintenance costs were reviewed and updated. The 1998 report showed two costs ($75,400 and $89,913) for vessel and machinery maintenance cost. The $75,400 was used for determining the vessel operating cost in that report. However, this cost was presented as a lump sum and did not provide much basis for updating. The $89,913 was based on the 1997 Fleet Survey Report and was determined to be more reliable for review and update because of the detailed breakdown of the operating costs. The detailed cost breakdown was provided to Trident Seafood (Trident) for review. Trident currently operates 8–10 crabber/tender vessels in the BSAI region and approximately 20 vessels total in AK and WA. Based on the experience of Trident in AK, they were considered to be a reliable source of information. The operating cost was revised to include biennial major overhaul and dry-docking. In those years, the annual repair costs could be as much as 40 percent than what was originally listed. An adjustment of 20 percent per year was made to the overall average to show the overall increase of 40 percent for every two years. The adjusted maintenance total is increased from the original $75,400 to $107,896, an increase of $32,496 per year.

Freight cost was revised according to current shipping prices. Freight costs include shipping costs for items such as nets, mooring buoys, lines, electronic equipment, and machinery. Trident noted that the cost to ship one trawl net north was approximately $1,500. It was also stated that, with other items that need to be shipped to the boats, the costs could easily be double or triple than what was previously shown, especially for boats less than 130 feet in length. It was determined that doubling the freight costs would be a more accurate reflection of the actual cost. The stores total cost was shown as $99,200 and $102,661 in the 1998 report. The $99,200 was presented as a lump sum. The $102,661 was presented in a detailed breakdown and was used for review and update. The total for freight after averaging was doubled from $1,364 to $2,728.

The remaining cost for stores items were unchanged and averaged accordingly. The stores total is increased from the original $99,200 to $104,025, an increase of $4,825 per year. The

total variable operating cost is $211,921, versus the original of $174,600, an increase of $37,321 per year.

The transient fleet spends an average of 285 days participating in a number of fisheries in the Aleutian Island region. Individual items were classified into fixed and variable operating costs. Fixed costs are those that would be incurred by the vessel owner whether or not the boat was put to any productive use. These annual cost items include fixed depreciation and return on investment. Fixed costs were not considered when calculating annual operating costs. Variable costs, for this exercise, are those that occur while the vessel is in operation, including vessel/machinery maintenance, bait, insurance, food, miscellaneous (observer fees and assessment/fish taxes), and the cost of fuel and lubricating oil (including hydraulic oil and similar consumables).

Fuel consumption estimates are based on a Northern Economics survey, completed in 1995, in which respondents indicated an average fuel consumption of 50.34 gallons per hour for vessels in this class. This fuel consumption rate was also reviewed by Trident Seafoods and was considered to be acceptable. Lube oil expenses were estimated as 7 percent of fuel costs. Average daily costs were found by spreading the total costs over the total number of operating days, 285. Hourly costs were found by dividing daily operating costs by 24 hours.

Annual variable operating costs are as follows:

Maintenance	$107,896
Stores	$104,025
Total	$211,921

The updated hourly operating cost for maintenance and stores would be $31, or ($211,921/285)/24.

Added to this is the hourly fuel component of $73, based on a fuel consumption rate of 50.34 gallons per hour and an average fuel cost of $1.45 per gallon. The price per gallon was obtained from the Trident Seafoods fuel dock, which is the only station in Sand Point. The updated total hourly operating cost for 2003 is $104 ($31 + $73).

Opportunity Cost of Time. Travel of any kind imposes costs on the fleet. These costs include additional operating expenses for the vessel as well as the crew's opportunity costs. The larger craft carry an average of four crewmembers per vessel, plus the skipper. Crewmembers incur an opportunity cost of time (OCT) associated with down time. Opportunity cost of time is the value of work or leisure activities forgone because of having to spend hours traveling from Sand Point to alternate harbors in an attempt to secure moorage space. The opportunity cost premise is based on the concept that the more time a vessel's crew is required to spend away from town searching for moorage space, the more valuable space at Sand Point becomes. Operating costs measure the direct out-of-pocket expenses associated with searching for harbor space, while the opportunity cost measures the time forgone by a vessel's crew.

For OCT calculations, a value of next best use of time has been assigned. For this report, the OCT has been given a minimum or leisure time value. According to ER 1105-2-100, in lieu of a project-specific estimate of the opportunity cost of leisure time, a value equal to one-third the wage rate is used. Based on a survey performed by Northern Economics in

association with ResourcEcon, entitled "Opportunity Cost of Time for Fishers," one-third the hourly wage rate for fishers in this category is $14.67, say $15.00. This cost was reviewed and determined to be valid for use in the opportunity cost of time calculations.

Lack of sufficient moorage space in Humboldt Harbor leads to a variety of difficulties. Vessels must raft together, as described earlier; endure delays when attempting to leave the harbor due to congestion; and damage each other as well as the docks. Also, many vessels must travel to other ports in search of protected moorage. Costs associated with both rafting of vessels and traveling to alternate ports have been computed and are presented in the following paragraphs.

4.4.2 Rafting Related Benefits

Dock and Piling Damage. Excessive rafting of vessels continues to place considerable strain on the docks, float system, and vessels at the harbor. In the 1998 report, an average of $19,000 was estimated for annual expenses to repair the harbor. The estimated annual repair cost was revised to $30,000 with about half of that cost due to rafting damages or $15,000. This increase ($19,000 to $30,000) was based on recent discussions with harbor personnel, which estimated that the strain from rafting leads to a higher percentage of damages than previously thought and that a higher percentage of damages would be alleviated with the project in place. Humboldt Harbor is still over-utilized by larger vessels year-round with overcrowding mainly occurring in the fall and winter months. The existing facility was only designed for 8 large vessels. However, rafting to accommodate 16 vessels or more is common during the winter months. The larger vessels sustain damage due to impacts with other vessels and docks. During interviews with vessel captains and owners, they stated damages from rafting were on average between $1,000 and $5,000. The average of $2,500 from the 1998 report appears to be relevant for 2003 and will be used to calculate damages. The 36 vessels estimated to be damaged appears consistent with moorage demand remaining constant. A total of $90,000 is estimated for vessel damages annually because of rafting. The total rafting and congestion-related benefits are estimated at $105,000.

4.4.3 Travel Related Expenses

Humboldt Harbor is full during the winter months, normally with local vessels. Based on the number of permits issued/fished and total number of pot/trawl vessels fishing in the Bering Sea/Aleutian Island region, the local fleet is projected to be relatively the same size. It is assumed that the number of vessels looking for alternative moorage would be consistent. As stated in the 1998 report, during October through December, approximately 55 individual vessels larger than 80 feet are required to travel to other local ports due to lack of adequate moorage at Humboldt Harbor. The majority of these vessels make the round trip from Sand Point to King Cove, Dutch Harbor, or Kodiak each time. According to local fishers and harbor personnel at each location, approximately 25 vessels or 45 percent, are able to obtain moorage in King Cove; 18 vessels or 33 percent in Dutch Harbor; and 12 vessels or 22 percent in Kodiak. Operators report they make these round trips an average of 3 times per year. Travel to King Cove is 156 miles round trip and takes approximately 16 hours; travel to Dutch Harbor is a 472-mile round-trip journey and takes 47 hours; and Kodiak is 720 miles round trip and takes approximately 70 hours. There are also 22 trips to the Pacific Northwest, which are exclusive of and in additions to the travel to alternate local ports. Operating costs

and OCT expenses have been re-calculated and are shown below. The number of vessels traveling to alternate harbors in the without-project condition is shown in table 13.

Local Travel	Cost ($)
King Cove.	
25 vsl x 3 round trips x 16 hr/trip x $104/hr op cost	124,800
25 vsl x 3 round trips x 16 hr/trip x $15/hr OCT x 5 crew	90,000
Total	214,800
Dutch Harbor.	
18 vsl x 3 round trips x 47 hr/trip x $104/hr op cost	263,952
18 vsl x 3 round trips x 47 hr/trip x $15/hr OCT x 5 crew	190,350
Total	454,302
Kodiak.	
12 vsl x 3 round trips x 70 hr/trip x $104/hr op cost	262,080
12 vsl x 3 round trips x 70 hr/trip x $15/hr OCT x 5 crew	189,000
Total	451,080
Total annual local travel expense	1,120,182

Pacific Northwest Travel. Vessels unable to secure moorage locally must occasionally travel to ports in the Pacific Northwest. Travel to Pacific Northwest ports is also periodically necessary for vessel maintenance and repair. As previously stated, based on the local fleet maintaining the same size, it is assumed that the same number of vessels will travel to the Pacific Northwest for moorage. An average of 22 vessels of the transient fleet make one round trip per vessel per year to the Pacific Northwest between fishing periods, because sufficient moorage is unavailable in the BSAI area. These Pacific Northwest trips are exclusive of, and in addition to, travel to local alternative ports. Not all of the standard five crew members, normally on board, make these extended journeys. Skippers report it is usual for 3 crew, inclusive of the skipper, to make the trip. Expenses for this travel are as follows:

Pacific Northwest Travel	Cost ($)
22 vsl x 1 round trip x 343 hr/trip x $104/hr op cost	784,784
22 vsl x 1 round trip x 343 hr/trip x 3 crew x $15/hr OCT	339,570
Total	1,124,354
Total travel-related expenses	2,244,536

Table 13. Without-Project Vessels to Alternate Ports

Harbor	No. Vessels
King Cove	25
Dutch Harbor	18
Kodiak	12
Pacific Northwest	22
Total Vessels	77

Summary. Annual expenses under existing conditions are summarized as follows:

Rafting and congestion-related expenses	$105,000
Travel-related expenses	$2,244,536
Total	$2,349,536

4.5 With-Project Conditions and Project Benefits

This section provides the analysis of the total potential economic benefits that could be realized with expanded moorage facilities at Sand Point. Only those categories of benefits that can be assigned tangible monetary values directly, resulting from harbor development, are included. Information, supporting the benefits claimed in this report, was obtained through a site visit to Sand Point, follow-up telephone conversations with vessel operators and harbor personnel, and by review of statistics from the resource and fisheries management agencies. Telephone and personal interviewing was chosen rather than written surveys as the primary information-gathering tool where secondary data sources were not available.

Justification for a proposed action is determined by comparing average annual equivalent costs—including project first costs, interest during construction, and operating and maintenance expenses—with an estimate of the average annual benefits to be derived from the project. Benefits and costs are made comparable to an equivalent time value of money by application of an appropriate interest. The interest rate used in this analysis is the latest approved rate (5-7/8 percent) with a 50-year project life and October 2003 price level. The Recommended Plan would provide moorage for 37 vessels up to 150 feet in length. The plan would provide moorage for the majority of permanent and transient vessels currently on the waiting list.

4.5.1 Rafting Related Benefits

Dock and Piling Damage. Based on recent discussions with harbor personnel, the average yearly cost to repair and/or replace damaged pilings was increased to $30,000. Of this amount, about $15,000 (50 percent) is attributed to the additional strain caused by rafting practices. The difference in the annual cost between the with-project and without-project conditions represents the benefit. For the with-project conditions, minimal rafting will occur, based on need for moorage. For example, instead of 16 vessels rafted, there may be 2 vessels rafted compared with the other 8 transient vessels. Damages may continue to exist, but to a much lesser extent. The with-project condition is assumed to alleviate at least 50 percent of the current maintenance and replacement costs attributable to rafting, according to harbor personnel through interviews. This equates to an annual savings of $7,500. The feasibility report assumed that 35 percent of the damages are due to the rafting of vessels and that 40 percent of the damages would be alleviated with the project in place.

Vessel Damage. Dissimilar vessels tying together, such as large to small or steel to fiberglass, causes damages to either or both vessels. Also, a loss or lack of bumpers between vessels causes extensive damage to fiberglass and wooden vessels by the harmonic movement of the boats in the water. This is particularly noticeable with vessels of different sizes or design that have unequal pitch and roll cycles.

Currently, $90,000 in vessel damages are incurred annually because of rafting. The 1998 study estimated that 40 percent of these damages would be avoided under the with-project condition. Based on recent discussions with harbor personnel, the estimated annual percentage of vessel damages, which would be avoided under the with-project condition, was increased to 50 percent. This equates to $45,000 in vessel damages avoided each year.

The total rafting-related benefits would amount to $52,500 ($7,500 + $45,000) annually.

4.5.2 Travel-Related Benefits

To find protected space, operators currently seek moorage at King Cove, Dutch Harbor, Kodiak, Homer, and occasionally ports in the Pacific Northwest. An average of 25 vessels secure space in King Cove's small harbor each year, 18 find moorage in Dutch Harbor, and 12 moor in Kodiak. Twenty-two large transient vessels must travel to Pacific Northwest locations. The need to travel to the Pacific Northwest, due to lack of adequate moorage space, could probably be eliminated. As previously stated, it is assumed that since the local fleet has remained the same size, the same number of vessels would seek alternative moorage. It is likely the ratio of vessels traveling to alternate local ports would remain the same. The number of vessels traveling to alternate harbors under the with-project condition is shown in table 14. Costs for travel-related expenses are as follows.

Local Travel.	Cost ($)
King Cove.	
25 vsl x 3 round trips x 16 hr/trip x $104/hr op cost	124,800
25 vsl x 3 round trips x 16 hr/trip x $15/hr OCT x 5 crew	90,000
Total	214,800
Dutch Harbor.	
1 vsl x 3 round trips x 47 hr/trip x $104/hr op cost	14,664
1 vsl x 3 round trips x 47 hr/trip x $15/hr OCT x 5 crew	10,575
Total	25,239
Total annual local travel expense	240,039

Pacific Northwest Travel. At present, $1,118,784 is spent annually by fishers traveling to Pacific Northwest ports. With either alternative, this out-of-state travel, due to lack of adequate moorage in local ports, would be eliminated.

Total travel related costs	$240,039
Annual travel savings	
Existing condition travel-related expenses	$2,244,536
Saved with either alternative	$240,039
Annual travel savings	$2,004,497

Table 14. With-Project Vessels to Alternate Ports

Harbor	No. Vessels
King Cove	25
Dutch Harbor	1
Kodiak	0
Pacific Northwest	0
Total Vessels	26

4.5.3 Summary

Annual savings include $2,004,497 in travel savings plus $52,500 in congestion-related benefits for a total of $2,056,997. The overall vessel travel under the without- and with-project conditions is examined in table 15. National Economic Development (NED) benefits are shown in table 16.

Table 15. Without- and With-Project Vessel Trips to Distant Ports

Alternate Harbor	Without-project vessels and trips to alternate harbors	With-project vesses and trips to alternate harbors	With-project vessels and trips eliminated by using Humboldt Harbor
	Vessels (trips)	Vessels (trips)	Vessels (trips)
King Cove (3 trips per vessel)	25 (75)	25 (75)	0 (0)
Dutch Harbor (3 trips per vessel)	18 (54)	1 (3)	17 (51)
Kodiak (3 trips per vessel)	12 (36)	0 (0)	12 (36)
Pacific Northwest (1 trip per vessel)	22 (22)	0 (0)	22 (22)
Total Vessels (trips)	77 (187)	26 (78)	51 (109)

Table 16. Summary of Annual NED Benefits

Benefit Category	Annual Benefit ($)
Travel related benefits	2,004,497
Rafting related benefits	52,500
Total annual benefits	2,057,000 (roundec

4.6 Optimum Harbor Size and Project Depth

The harbor features were optimized during the feasibility report phase. Project conditions during the preparation of this report did not warrant their reoptimization. Three sizes were evaluated for harbor size optimization during the feasibility study: 25, 37, and 42 vessel slips. It was determined that 37 vessel slips would provide the greatest net benefits.

4.7 Environmental Considerations

4.7.1 Updated Coordination

Updated coordination occurred for this project under the Endangered Species Act. The Corps conducted a biological assessment in June 2000 for the Steller's eider, a threatened species. A biological opinion of the eider was prepared by the U.S. Fish and Wildlife Service in October 2002. These documents are located in appendix C. The National Maine Fisheries Service was contacted for an update on endangered species under their jurisdiction. The harbor area is within the range of the endangered Steller sea lion and several whale species. They concurred that the harbor project would have no effect on the sea lion or whale species. An e-mail stating their concurrence is included in appendix C.

The environmental conditions and the project itself did not change, and therefore, did not warrant a supplemental EA/FONSI. Since the project and conditions have not changed, updated coordination with the Office of History and Archeology is not necessary. A survey done in 1998 revealed no affected cultural properties in the area. A memorandum for record, which documents the decision to not prepare a supplemental EA/FONSI, is included in appendix C.

4.7.2 Mitigation

The biological opinion agreed that the project would adversely affect the Steller's eider. Reasonable and prudent measures (RPM) were included to minimize the effect. Several terms and conditions necessary to implement the RPM have been performed; such as developing a best management practice plan and pre-construction eider surveys. The costs of these items are considered a sunk cost and not included in the project cost, shown in the LRR. The remaining terms and conditions include the addition of light shields for the harbor lights, monitoring petroleum releases, and post-construction eider surveys at the harbor. These items have an estimated cost of $130,000 and have been included in the total project cost shown in the LRR

4.8 Affirmation of NED

Reevaluation of the economic analysis did not change the conclusions and recommendations of the feasibility report. The Recommended Plan, which is discussed in detail in section 5, remains economically justified. Net annual NED benefits and the benefit/cost ratio are $1,191,000 and 2.4, respectively.

5.0 DESCRIPTION OF CURRENT RECOMMENDED PLAN

5.1 Plan Components

The Recommended Plan consists of a new harbor constructed south of the existing harbor. The plan would provide protected moorage for 37 vessels, 80 to 150 feet in length. The Recommended Plan remains unchanged from the authorized project and is shown in figure 2.

5.1.1 Rubblemound Breakwater

A 570-foot-long rubblemound breakwater would be extended from the south breakwater of the existing harbor to form the northwest side of the harbor and the eastern side of the entrance channel. Maximum depth of water is –35 feet MLLW along the alignment of the breakwater. A 730-foot-long breakwater would be constructed from shore, extending northwest to a depth of approximately –15 feet MLLW, where it would change to a north-south alignment to form the western side of the entrance channel. Foundation materials are sand, gravel, and cobbles, which would serve as a suitable base for the rubblemound structure. Armor stone with a range of sizes from 1,900 to 3,200 pounds would be used on the seaside face of the breakwater. Secondary stone would range from 200 to 1,900 pounds. Core material would be 1 to 200 pounds. Armor stone layer thickness would be 5.0 feet, and secondary stone layer thickness would be 2.5 feet.

5.1.2 Channels and Basin

The entrance channel is designed to accommodate one-way traffic for a vessel 150 feet long with a beam of 34 feet and an unloaded draft of 11.5 feet. The entrance channel has a minimum bottom width of 120 feet with additional width in the channel turn increasing to 230 feet (1.5 times the design vessel length). This would allow for adequate maneuverability and clearance on either side of the breakwaters. The area of the entrance channel is approximately 2.9 acres. Dredging of 44,300 yd^3 in the entrance channel is required to obtain a depth of –18 feet MLLW throughout.

5.1.3 Mitigation

Mitigation for impacts to the Steller's eider include the development of a best management practice plan, pre- and post-construction eider surveys, light shields for the harbor lights, and monitor petroleum releases for two years post-construction.

5.2 Plan Costs

Interest during construction (IDC) was added to the initial cost to account for the opportunity cost incurred during the time after the funds have been spent, but before the benefits begin to accrue. Interest during construction was calculated by matching the construction expenditure flow with the interest the funds would have accumulated had they been deposited in an interest-bearing account.

Initial cost of the NED plan is $13,155,000, including $9,000 for navigational aids to be provided by the U.S. Coast Guard. This initial cost also includes $500,000, which was expended to date in preparation of plans and specifications, and this report. This cost was included in the overall project cost to determine the cost sharing but was excluded from NED investment cost and benefit/cost ratio. Interest on the plans and specifications (P&S) was

calculated and added to the initial cost before the IDC was calculated. The IDC for the initial cost is $756,000. The initial cost plus IDC equals $13,402,000, which is the total investment cost. With the annual operation and maintenance cost of $31,000, the total annual NED investment cost is $866,000. The fully funded cost of the Recommended Plan, escalated to the mid-point of construction, is $13,572,000. The initial cost is shown in table 17. Detailed M-CACES cost estimate is shown in appendix A.

5.3 Plan Benefits

The National Economic Development benefit from the Recommended Plan is $2,057,000 and is presented in table 16. Net annual benefits are $1,191,000 with a benefit/cost ratio of 2.4.

5.4 Risk and Uncertainty

Because of the limited scope of this report, a risk and uncertainty analysis was not performed. However, a risk and uncertainty analysis was included in appendix B of the feasibility report and remains unchanged for this report.

5.5 Plan Accomplishment

The Recommended Plan would meet the planning objectives (see section 3.2) for Sand Point in the following ways:

- Provides year-round, convenient moorage for 37 large commercial vessels.
- Reduces the considerable costs for fuel and vessel maintenance associated with vessels traveling to distant alternate ports.
- Reduces lost opportunity costs and improves the local economy by providing vessel availability on a year-round basis for vessels in excess of 80 feet, including short-term vessel use during adverse weather.
- Provides a harbor of refuge for transient vessels.
- Preserves environmental resources to the maximum level consistent with maximizing NED net benefits and other objectives.

Table 17. Federal/Non-Federal Initial Cost Apportionment for NED Plan
(October 2003 price level)

Items	Total Project Cost ($000)	Implementation Costs ($000)			
		Federal	%	Non-Federal	%
General Navigation Features (GNF):					
Mobilization/demobilization	657	591		66	
Preconstruction, engineering, & design (PED)	661	595		66	
PED—sunk cost [a]	500	450		50	
Construction management (S&A)	861	775		86	
Entrance channel and maneuvering area	1,423	1,281		142	
Breakwaters	5,343	4,809		534	
Eider mitigation	130	117		13	
LERR (GNF)—Federal administrative costs	6	5		1	
Subtotal GNF	9,581	8,623	90	958	10
Additional Funding Requirement					
10% of GNF		-958		958	
GNF LERR credit		75		-75	
Adjustment for GNF LERR credit		-883		883	
Subtotal of GNF Related Items	9,581	7,739		1,842	
LERR (GNF)—Acquisition credit	75	0	0	75	100
Aids to navigation	9	9	100	0	0
Local Service Facilities					
Mooring basin and floats (includes PED and S&A)	3,434	0		3,434	
LERR (LSF)	56	0		56	
TOTAL LOCAL SERVICE FACILITIES	3,490	0	0	3,490	100
ULTIMATE FIRST COST REQUIREMENTS	**13,155**	**7,748**		**5,407**	

[a]The PED sunk cost was included to determine the project cost sharing. Sunk costs were not included in the benefit/cost ratio.

5.6 Plan Implementation

5.6.1 Construction

Federal. The Corps of Engineers would be responsible for construction of the breakwaters, entrance channel, and maneuvering basin. The U.S. Coast Guard would be responsible for installing aids to navigation.

Local. The sponsor would be responsible for excavating the mooring basin, constructing the float system, and providing all lands, easements, and rights-of-way necessary for the project. The sponsor would also be responsible for utility service to the harbor and for funding its share of the general navigational features.

5.6.2 Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R)

Federal. The Corps of Engineers would maintain the breakwaters and channels, and conduct periodic hydrographic surveys to determine if or when maintenance dredging is required. The U.S. Coast Guard would maintain navigational aids. Table 18 shows OMRR&R intervals and costs.

Local. The local sponsor would perform maintenance dredging of the mooring basin, if necessary, maintain the floats, utilities, etc., and operate the completed project. The local sponsor may use dredged material for approved fill activities or other construction activities.

Table 18. Annual Costs of OMRR&R

		Equivalent Annual Cost ($)			
	Interval (yr)	Corps	Other Federal	Local Sponsor	Total
Breakwater, replace 2% armor	15	3,000			3,000
Hydrographic surveys	4	3,000			3,000
Maintain navigation aids	5		1,000		1,000
Maintain floats, stalls, and piles	1			4,000	4,000
Replace floats, stalls, and piles	30			20,000	20,000
TOTAL OMRR&R COSTS		6,000	1,000	24,000	31,000

5.6.3 Real Property Interests

Real property interests remain unchanged from the feasibility report. The sponsor will be required to provide all lands, easements, rights-of-way, and relocation (LERR) necessary for construction of the project. The project's real estate costs for both Federal and non-federal portions were updated from the feasibility report and are provided in table 19. Details on the real property interests can be found in appendix F of the feasibility report.

Table 19. Real Estate Costs

Item	Federal ($)	Local ($)	Subtotal ($)	Total ($)
Federal project portions (GNF)				
Administration	6,000	12,000	18,000	
Lands	0	63,000	63,000	81,000
Non-federal project portions				
Administration	0	6,000	6,000	
Lands	0	50,000	50,000	56,000

5.6.4 Cost Apportionment

Construction costs for the project were apportioned in accordance with the Water Resources Development Act of 1986. The cost apportionment is summarized in table 20.

Table 20. Apportionment Of Construction Costs

	Construction cost contribution (%)	
Portion of project	Federal	Local
General navigation features (includes entrance channel, maneuvering basin, and breakwaters)	80	20[a]
Local features (includes floats and mooring basin)	0	100
Coast Guard navigation aids	100	0

[a]Non-federal interests must provide cash contributions toward the costs for construction of the general navigation features (GNF) of the project, paid during construction (PDC) as follows: For project depths of up to 20 feet–10%; for project depths over 20 feet and up to 45 feet–25%; and for project depths exceeding 45 feet–50%. For all depths, they must provide an additional cash contribution equal to 10% of GNF costs (may be financed over a period not exceeding 30 years), against which the sponsor's costs for LERR (except utilities) shall be credited. *Note:* Costs for general navigation features include associated costs, such as mobilization.

The sponsor is also responsible for 100 percent of the construction cost of the inner harbor facilities, which includes dredging the mooring area and float system. The Federal Government would assume 100 percent of the operation and maintenance costs for the breakwater and entrance channel. The sponsor would assume all other operation and maintenance costs, and would be responsible for providing LERR for construction and future maintenance of the inner harbor facilities.

The initial GNF construction cost is 90 percent for the initial Federal investment and 10 percent for the initial non-federal share, because all dredging is less than 20 feet. The sponsor must also contribute an additional 10 percent, plus interest, during a period not to exceed 30 years after completion of the general navigation features. The sponsor would be credited toward this 10 percent cost with the value of LERR necessary for construction, operation, and maintenance of the general navigation features. This post construction contribution is currently estimated at $883,000 as shown below.

Total GNF	10% of GNF	Maximum LERR credit	Non-federal post construction contribution
$9,581,000	$958,000	$75,000	$883,000

5.6.5 Financial Analysis

An analysis of the sponsor's financing capability was included in the feasibility study. The analysis was reviewed for this study and determined to remain as adequate proof of the sponsor's financing capability. Therefore, a reanalysis of the sponsor's financing capability was not performed for this report.

5.7 Public Involvement

The community of Sand Point and Aleutians East Borough (AEB) worked closely with the Corps' study team during the feasibility and reevaluation studies. This cooperation among the study participants resulted in the affirmation of the NED plan. The community and AEB have stated their preference for the NED plan.

5.8 Consultation Requirements

The feasibility study was coordinated with all relevant Federal and state agencies. Information on this coordination is provided in the Environmental Assessment. The project received an Alaska Coastal Management Program consistency determination and was issued a State Certificate of Reasonable Assurance under the Clean Water Act.

Updated coordination occurred with these agencies following completion of the feasibility study. The Corps conducted a biological assessment, and the U.S. Fish and Wildlife Service prepared a biological opinion for the Steller's eider, a threatened species. These documents concluded that the project would adversely affect the eider. Reasonable and prudent measures (see section 4.7.2) were included to minimize the affects. The National Maine Fisheries Service concurred that the harbor project would have no effect on the Steller sea lion or whale species. The environmental conditions and the project itself did not change, and therefore, did not warrant a supplemental EA/FONSI.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The studies documented in this report indicate that the currently authorized Federal project, which is the Recommended Plan, remains warranted and justified. The update of the latest approved economic analysis shows that the project remains economically justified. Construction of these navigational improvements is technically feasible, and environmentally and socially acceptable. The Aleutians East Borough is willing to act as local sponsor for the project and fulfill all the necessary local cooperation requirements. Thus it is concluded that the Federal government, in cooperation with the Aleutians East Borough, should pursue construction of the Recommended Plan.

6.2 Recommendations

I recommend that the navigational improvements at Sand Point, Alaska, be constructed generally in accordance with the plan herein, and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable at an estimated total Federal cost of $7,748,000 and $7,000 annually for Federal maintenance provided that prior to construction the local sponsor agrees to the following:

A. Enter into an agreement which provides, prior to execution of the project cooperation agreement, 25 percent of the design costs;

B. Provide, during construction, any additional funds needed to cover the non-federal share of design costs;

C. The estimated non-federal initial costs for the general navigation features of the project is $1,842,000 plus $75,000 for GNF LERR and $3,490,000 for local service facilities;

D. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, the local service facilities consisting of the new mooring basin, all moorage facilities in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and state laws and regulations and any specific directions prescribed by the Federal Government;

E. Provide all lands, easements, rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features (including all lands, easements, and rights-of-way, and relocations necessary for dredged material disposal facilities);

F. Provide, during the period of construction, a cash contribution equal to the following percentages of the total cost of construction of the general navigation features (which include the construction of land-based and aquatic dredged material disposal facilities that are necessary for the disposal of dredged material required for project construction, operation, or maintenance and for which a contract for the Federal facility's construction or improvement was not awarded on or before October 12, 1996):

1. 10 percent of the costs attributable to dredging to a depth not in excess of 20 feet.
2. 25 percent of the cost attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet.
3. 50 percent of the costs attributable to dredging to a depth in excess of 45 feet;

G. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional 10 percent of the total cost of construction of general navigation features. The value of lands, easements, rights-of-way, and relocations provided by the non-federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

H. For so long as the project remains authorized, operate and maintain the local service facilities, and provide lands, easements, and rights-of-way for any dredged or excavated material disposal areas, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and state laws and regulations and any specific directions prescribed by the Federal Government;

I. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor owns or controls for access to the general navigation features for the purpose of inspection, and, if necessary, for the purpose of operating, maintaining, repairing, replacing, and rehabilitating the general navigation features;

J. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

K. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of construction of the general navigation features, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to state and local governments at 32 CFR, Section 33.20;

L. Perform, or cause to be performed, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, or rehabilitation of

the general navigation features. However, for lands that the Government determines to be subject to navigation servitude, only the Government shall perform such investigation unless the Federal Government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;

M. Assume complete financial responsibility, as between the Federal Government and the non-federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features;

N. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;

O. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987, and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

P. Comply with all applicable Federal and state laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 USC 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army";

Q. Provide the non-federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation, that are in excess of 1 percent of the total amount authorized to be appropriated for the project, in accordance with the cost sharing provisions of the agreement;

R. Accomplish all removals determined necessary by the Federal Governement other than those removals specifically assigned to the Federal Governement;

S. Do not use Federal funds to meet the non-federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

The recommendations for implementation of navigation improvements at Sand Point, Alaska reflect the policies governing formulation of individual projects and the information available at this time. They do not necessarily reflect the program and budgeting priorities inherent in the local and state programs or the formulation of a national civil works water resources program. Consequently, the recommendations may be changed at higher review levels of the executive branch outside Alaska before they are used to support funding.

18 DEC 2003

Date

Timothy J. Gallagher
Colonel, Corps of Engineers
District Engineer