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CHIGNIK HARBOR, ALASKA

COMMUNICATION

FROM

THE ACTING ASSISTANT SECRETARY, THE DEPARTMENT OF THE ARMY

TRANSMITTING

A REPORT ON THE AUTHORIZATION OF A DEEP-DRAFT NAVIGATION PROJECT AT CHIGNIK HARBOR, ALASKA, PURSUANT TO PUB. L. 104–303, SEC. 101(b)(1)

SEPTEMBER 8, 1997.—Referred to the Committee on Transportation and Infrastructure and ordered to be printed

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

26 AUG 1997

REPLY TO
ATTENTION OF

Honorable Newt Gingrich
Speaker of the House
of Representatives
Washington, D.C. 20515

Dear Mr. Speaker:

Section 101(b)(1) of the Water Resources Development Act of 1996, authorized a deep-draft navigation project at Chignik Harbor, Alaska. The Secretary of the Army supports the authorization and plans to implement the project through the normal budget process.

The authorized project is described in the report of the Chief of Engineers dated September 18, 1996, which includes other pertinent reports and comments. These reports are in partial response to a resolution adopted by the House Committees on Public Works on December 2, 1970.

The views of the State of Alaska, and the Departments of the Interior and Transportation are set forth in the enclosed report.

The authorized project maximizes net national economic development benefits consistent with environmental quality. The project consists of a new deep-draft navigation harbor and related infrastructure at Chignik, Alaska. The Federal navigation features include two rubble mound breakwaters, one about 940 feet long and the other about 1,120 feet long, each at a crest elevation of 18.5 feet above mean lower low water (MLLW); and, an entrance channel about 400 feet long, with a maximum width of about 150 feet, and a depth of about 19.5 feet below MLLW. In order to realize project benefits, non-Federal interests would dredge a nine-acre basin with docks and other harbor facilities to provide for year-round, protected mooring of up to 105 commercial fishing vessels. The mooring basin would be located within the breakwaters and have depths ranging from 12.0 to 16.5 feet below MLLW. A 2.3 acre staging area would also be located within the protected breakwater area. To avoid potential adverse environmental impacts the breakwaters will be designed to accommodate juvenile fish

movement, while dredging will be accomplished during periods of time that will avoid impacts to migrating adult and juvenile salmon. No separable fish and wildlife mitigation is required.

Based on October 1995 price levels, the total first cost of the authorized project is estimated at about $10,365,000, with a Federal cost of about $4,282,000, and a non-Federal cost of about $6,083,000.

The Office of Management and Budget advises that there is no objection to the submission of the report to the Congress. A copy of its letter is enclosed in the report.

Sincerely,

John H. Zirschky
Acting Assistant Secretary of the Army
(Civil Works)

Enclosure

COMMENTS OF THE OFFICE OF MANAGEMENT AND BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

MAY 27 1997

The Honorable H. Martin Lancaster
Assistant Secretary of the Army
for Civil Works
Pentagon - Room 2E570
Washington, D.C. 20310-0103

Dear Mr. Lancaster:

As required by Executive Order 12322, the Office of Management and Budget has completed its review of your November 5, 1996, Small Boat Harbor Interim Feasibility Report for Chignik, Alaska.

Our review concluded that your recommendations are consistant with Administration policy. The Office of Management and Budget does not object to your submitting this report to Congress.

Sincerely,

T.J. Glauthier
Associate Director
Natural Resources,
Energy, and Science

COMMENTS OF THE STATE OF ALASKA

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
OFFICE OF THE COMMISSIONER

TONY KNOWLES, GOVERNOR
3132 CHANNEL DRIVE
JUNEAU, ALASKA 99801-7898

TEXT: (907) 465-3652
FAX: (907) 586-8365
PHONE: (907) 465-3900

May 16, 1996

Policy Review Branch
Policy Review and Analysis Division
Attn: CEW-AR (SA)
7701 Telegraph Road
Alexandria, Virginia 22315-3861

Dear Mr. David B. Sanford, Jr.:

Thank you for the opportunity to review and comment on the proposed report, the final Supplemental Environmental Impact Statement (SEIS), on Chignik, Alaska.

I concur in the findings, conclusions and recommendations of the Alaska District Engineers.

Sincerely

Joseph L. Perkins, P. E.
Commissioner

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

ER 96/229

JUL 3 1996

Mr. David B. Sanford, Jr.
Chief, Policy and Analysis Division
Directorate of Civl Works
Policy Review Branch
ATTN: CECW-AR (SA)
7701 Telegraph Road
Alexandria, Virginia 22315-3861

Dear Mr. Sanford:

The Department of the Interior has completed its review of the proposed Chief of Engineers report and final supplemental environmental impact statement for the Small Boat Harbor, Chignik, Alaska.

We have no comments on the report and do not object to the proposed project.

Sincerely,

Willie R. Taylor
Director, Office of Environmental
Policy and Compliance

COMMENTS OF THE DEPARTMENT OF TRANSPORTATION

U.S. Department of Transportation
United States Coast Guard

Commander
Seventeenth Coast Guard District

P.O. Box 25517
Juneau, AK 99802-5517
Staff Symbol: mon
Phone: 907/463-2270

16500

JUL 16 1996

Department of the Army
U.S. Army Engineer District, Alaska
P.O. Box 898
Anchorage, Alaska 99506-0898
Attn: Mr. Brust

Dear Mr. Brust,

Per your phone conversation with LTJG Michael Wessel on 13 June 96, the Coast Guard intends to establish a single aid to navigation on the proposed breakwater for the Chignik Boat Harbor. Specifically, we will establish a Coast Guard standard 2394 type tower at the seaward end of the north breakwater. Enclosure (1) is a detailed drawing of this type of tower. Enclosure (2) is a diagram indicating the intended location of the aid.

We would like the construction contract for this boat harbor to include the following requirements for the contractor, regarding this aid:

1. Coordinate installation of the anchor bolts for this tower with: Commanding Officer, USCGC FIREBUSH (WLB 393), P.O. Box 190653, c/o Integrated Support Command (ISC) Kodiak, Kodiak, AK 99619-0653; (907) 487-5830. USCGC FIREBUSH will provide the contractor an appropriate template for installation of the rock bolts.

2. Contactor will provide and install eight 1" by 30" rock anchor bolts following the template provided by the Commanding Officer of USCGC FIREBUSH. Refer to enclosure (3) for a detailed drawing of the anchor bolts.

3. Contractor will survey the position of this aid to navigation to the third order following its construction.

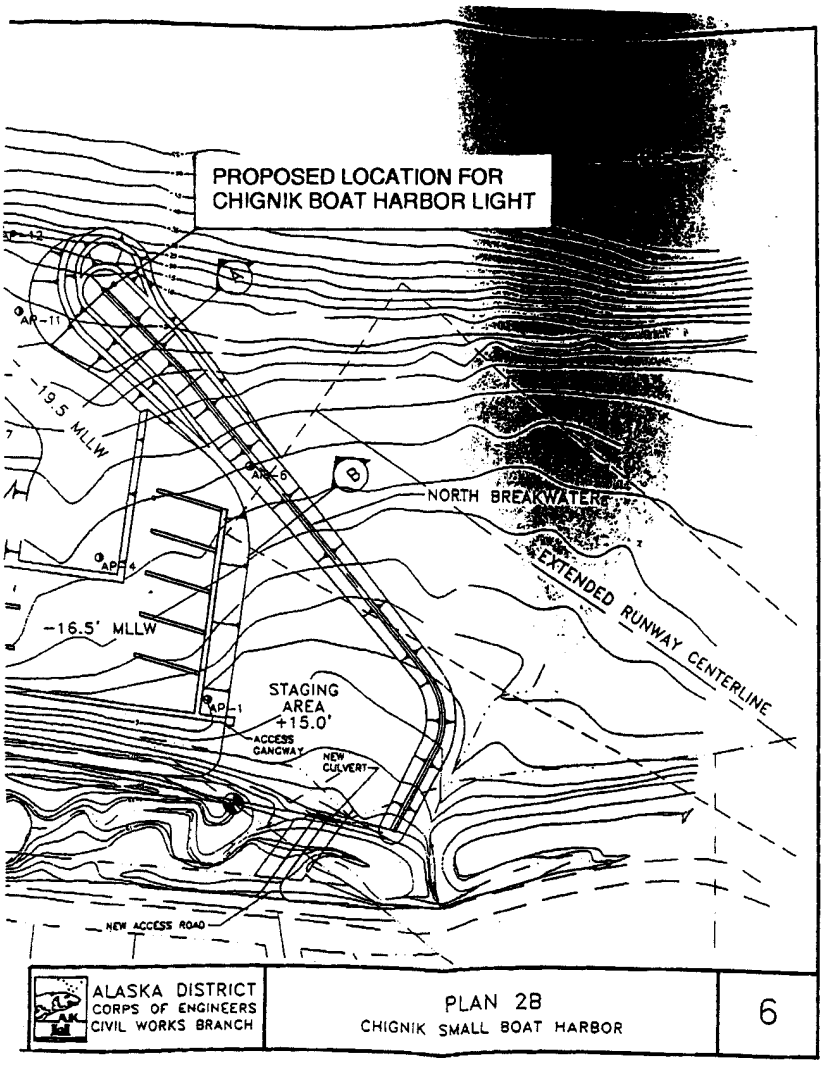
Thank you for the opportunity to provide input on this project. We look forward to assisting you in meeting the navigation needs of Chignik. Please direct questions to LTJG Michael Wessel at (907) 463-2270.

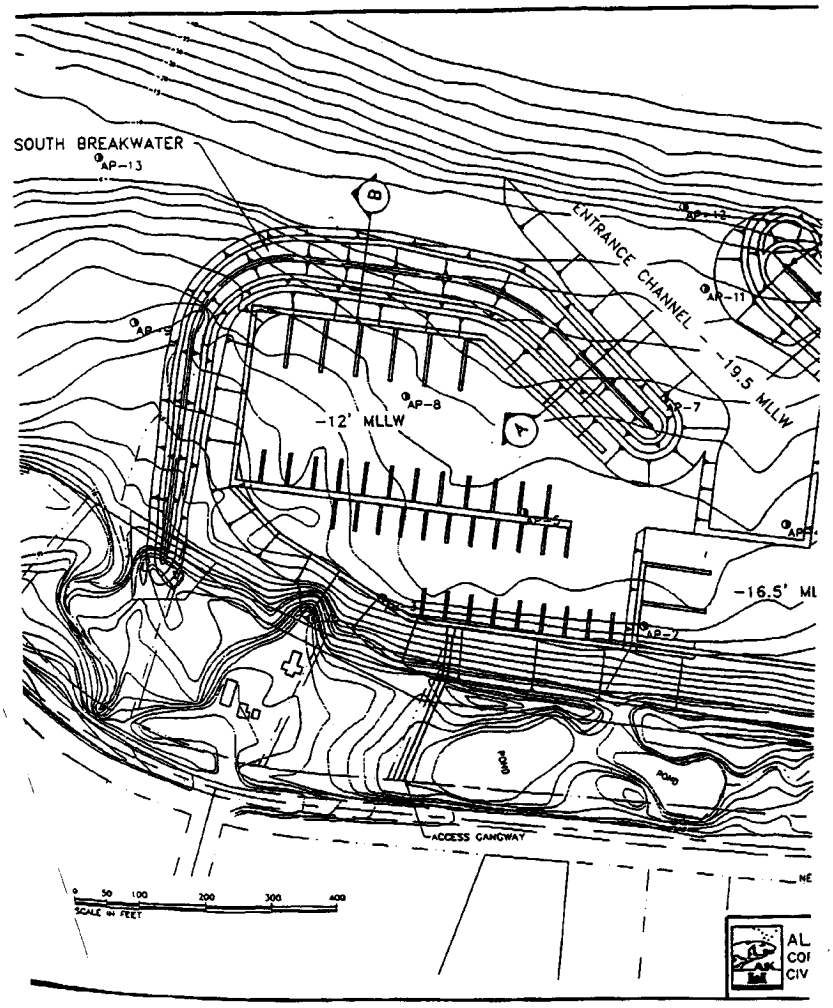
Sincerely,

R. G. Seagrave
Waterways Management and
Navigation Safety Branch
Seventeenth Coast Guard District
By direction

Encl: (1) Drawing for Coast Guard Standard Tower 2394
(2) Prpoposed location for Chignik Boat Harbor Light
(3) Drawing for standard rock bolts

Copy: Commanding Officer, USCGC FIREBUSH (WLB 393)


PROPOSED LOCATION FOR
CHIGNIK BOAT HARBOR LIGHT
AR-11
-19.5 MLLW
AR-6
NORTH BREAKWATER
AP-4
-16.5' MLLW
EXTENDED RUNWAY CENTERLINE
STAGING
AREA
+15.0'
AP-1
ACCESS
GANGWAY
NEW
CULVERT
NEW ACCESS ROAD
ALASKA DISTRICT
CORPS OF ENGINEERS
CIVIL WORKS BRANCH
PLAN 2B
CHIGNIK SMALL BOAT HARBOR
6


SOUTH BREAKWATER
AP-13
ENTRANCE CHANNEL
-19.5 MLLW
AP-11
AP-8
AP-7
-12' MLLW
-16.5' ML
AP-7
POND
POND
ACCESS GANGWAY
0 50 100 200 300 400
SCALE IN FEET

CHIGNIK HARBOR, ALASKA

REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CECW-PE (10-1-7a) 18 SEP 1996

SUBJECT: Chignik Harbor, Alaska

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on harbor improvements for Chignik, Alaska. It is accompanied by the reports of the district and division engineers. These reports are in partial response to a resolution adopted by the Committee on Public Works of the United States House of Representatives on 2 December 1970. Preconstruction engineering and design activities for the Chignik Harbor project will be continued under the authority provided by the 2 December 1970 resolution.

2. The reporting officers considered various alternative plans to protect the commercial fishing fleet operating in the Chignik area. They recommend the construction of an enclosed 9-acre moorage basin with an entrance and access channel between two rubblemound breakwaters into the harbor. The moorage basin would be deepened to 16.5 feet below mean lower low water (MLLW). The two breakwaters would be 940 feet long and 1,120 feet long, each with a crest elevation of 18.5 feet above MLLW. The entrance channel with a length of about 400 feet, and a maximum width of 150 feet, through the turn to allow a safety clearance for congestion, would be tapered to a minimum of 100 feet at each end. The inner access channel is 250 feet long. Both channels would be dredged to a depth of 19.5 feet below MLLW. The proposed mooring basin and inner harbor facilities would accommodate up to 105 commercial fishing vessels and are needed to achieve the benefits claimed. Approximately 317,600 cubic yards of dredged material from the basin and channels would be placed to form a small staging area for parking and storage adjacent to the harbor and on land at the local airport. The recommended plan would provide economic benefits to commercial fishing vessels by providing year-round moorage, reducing vessel damages and losses resulting from storms, and reducing lost opportunity costs due to lack of a safe harbor. It will also increase opportunities for subsistence harvests in the area. Non-Federal project features, mooring basin and inner harbor facilities would be constructed in conjunction with the general navigation features (GNF). The breakwaters have been designed to accommodate juvenile fish movement and as an additional

consideration to avoid potential environmental impacts, a window of permissible days would be placed on dredging operation to avoid impacts to migrating adult and juvenile salmon. No separable mitigation features are required.

3. The Administration is in the process of developing a new cost sharing policy for dredged material disposal facilities associated with Federal navigation projects. This proposal would allow the cost of diking and other improvements necessary for proper disposal of dredged material to be considered a general navigation feature and cost-shared accordingly. The operation, maintenance, repair, replacement and rehabilitation (OMRR&R) of the disposal facility would be 100 percent Federal, except for disposal facilities for projects in excess of 45 feet where the non-Federal sponsor would share 50 percent of the incremental OMRR&R costs. This proposal is currently being considered by Congress as part of the 1996 Water Resources Development Bill.

4. The estimated first cost of the recommended plan, based on October 1995 price levels, is $10,364,000, of which $4,158,000 would be Federal and $6,206,000 would be non-Federal. This cost includes $5,188,000 for GNF; $8,000 for aids to navigation; $145,000 for lands, easements, rights-of-way, and relocations (LERR); and $5,033,000 for sponsor's associated costs. The non-Federal costs include 100 percent of the associated costs for inner harbor facilities, and dredging the moorage basin; 10 percent of the cost for the GNF; and an additional payment of 10 percent of the cost of construction of the GNF, with interest, less credit for the value of LERR, paid over a period not to exceed 30 years. Total average annual charges, based on a discount rate of 7-5/8 percent and a 50-year period for economic analysis, are $862,000. Average annual benefits are estimated at $1,695,000, and the benefit-cost ratio is 2.0. The annual OMRR&R costs are estimated at $28,400. The recommended plan is the national economic development (NED) plan and is the plan preferred by the non-Federal sponsor.

5. Washington level review indicates that the recommended plan is technically sound, economically justified, and environmentally acceptable. The proposed project complies with applicable U.S. Army Corps of Engineers planning procedures and regulations. The views of interested parties, including Federal, State, and local agencies have been considered. Views of these entities did not surface any significant issues.

6. Accordingly, I recommend implementation of the proposed project generally in accordance with the reporting officers recommended plan, with such modifications as in the discretion of the Chief of Engineers may be advisable, and subject to cost-sharing that is consistent with Administration policy. My recommendation is made with the provision that, prior to implementation of the recommended improvements, the non-Federal sponsors shall enter into binding agreements with the Federal Government to comply with the following requirements:

a. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, the local service 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;

b. Provide all lands, easements, and 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;

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

d. Provide, during the period of construction, a cash contribution equal to 10 percent of the total cost of construction of the general navigation features for costs attributable to dredging to a depth not in excess of 20 feet;

e. Repay with interest, over a period not to exceed 30 years following completion of construction of the project, an additional 0 to 10 percent of the total cost of construction of general navigation features depending upon the amount of credit given for the value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features. 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;

f. 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;

g. 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;

h. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of three 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;

I. 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, and rehabilitation of the general navigation features. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigations 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;

j. 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;

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

l. 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 (Public Law 100-17), 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;

m. 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 U.S.C. 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;" and

n. Provide a cash contribution equal to 10 percent of total historic preservation mitigation and data recovery costs attributable to commercial navigation that are in excess of one percent of the total amount authorized to be appropriated for commercial navigation.

6. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program nor the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress; the sponsor, the city of Chignik; the State of Alaska; interested Federal agencies; and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

PAT M. STEVENS IV
Major General, USA
Acting Chief of Engineers

REPORT OF THE DISTRICT ENGINEER

SUMMARY

This report examines the need for a protected harbor at Chignik, Alaska, a fishing and seafood processing community on the south shore of the Alaska Peninsula. Chignik is one of the State's most productive fishing areas. Currently no protected moorage facilities are available in the community, and vessels stack six to seven deep against a dock owned by a local seafood processing plant. When storms arise, the boats must move away from the dock to a semiprotected area near the end of the airport runway. A harbor would allow the local fishing fleet year-round vessel storage and access, and it would decrease the community's dependence on private, unprotected docks owned by the seafood companies.

This study is unusual in that a Final Detailed Project Report (DPR) and an Environmental Impact Statement (EIS) were completed for the project in January 1988 under Section 107 of the 1960 River and Harbor Act, as amended. The project had a favorable benefit/cost ratio of 1.2, but the local sponsor was unable to afford its share. The sponsor requested the project be pursued as a General Investigations (GI) study. This, the current study, was authorized by Congress in 1993. Information from the previous Section 107 effort was used extensively in this GI feasibility study. As a result of this study, the proposed harbor moorage was expanded from 70 to 105 slips at a cost similar to that of the plan recommended in the previous study.

Both draft and final environmental impact statements already have been completed for the previously recommended plan. A change in the Alaska District policy on quarry sites required the preparation of draft and final supplemental EIS's in addition to the original EIS's. After the Chignik Section 107 project was deferred in 1990, the final supplemental EIS was not issued for public review. The recommended plan in this study has a different harbor layout. Due to the change in the recommended plan and the change in the Alaska District's policy on quarries, a supplemental EIS was prepared. This document was issued for public review in November 1995, and the final version is included with this report.

Harbor designs were considered for four sites in the Chignik area. Sites 1 and 4 were eliminated early in the study due to obvious deficiencies. Site 1, the site with the best natural wave protection, was dropped because of deep water which would increase the cost of the breakwater. Site 4, the closest to town, was eliminated because of unstable nearby cliffs and because the staging area would have to be built on intertidal and subtidal land, pushing the breakwater into deeper water and increasing its cost. Site 3 was subjected to further study and finally discarded because rapid near-shore depth increases and the presence of a submarine trench near the middle of the site tended to make breakwater rock requirements high.

Site 2 is the best harbor location for National Economic Development (NED). Two harbor plans were studied for this site. The recommended plan has a 9.0-acre mooring basin and a 1.9-acre entrance channel area. It would provide protected moorage for approximately 105 commercial fishing vessels.

The NED features of the project have a construction cost of $10,365,000 (October 1995 level), an annual NED investment cost of $862,200, and annual benefits of $1,695,400. The project's benefit-to-cost ratio is 2.0. The fully funded cost is estimated as $11,117,000 (July 1998 level), excluding $8,000 for navigational aids.

As local sponsor, the city of Chignik 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 currently estimated at $1,084,000. This does not include the cost of some local NED features (including the basin and float system) and other local features discussed in this report. The current estimate of the total non-Federal share of all costs of the project is $6,021,000. The city of Chignik is expected to request funding assistance from the State of Alaska.

The Federal share of project costs is currently estimated at $4,336,000, excluding $8,000 for navigational aids. It is recommended that this harbor be constructed with Federal participation.

PERTINENT DATA

Small Boat Harbor
Chignik, Alaska
Recommended Plan (2B)

Basin

Area . . . . . 9.0 acres
Depth . . . . . 12 to 16.5 ft at MLLW

Dredging volume
Channels . . . . . 65,600 yd^3
Basin & maneuvering area . 252,000 yd^3
Total . . . . . 317,600 yd^3

Channel depth . . . . . 19.5 ft at MLLW

Breakwater

Design wave . . . . . 6.0 feet
Length (north breakwater) . 940 feet
(south breakwater) . . . 1,120 feet
Crest elevation . . +18.5 feet MLLW
Crest width . . . . . 8 feet
Rock volume
Armor . . . . . 22,400 yd^3
Secondary . . . . . 21,600 yd^3
Core . . . . . 24,000 yd^3
Total . . . . . 68,000 yd^3

* * * * *

PROJECT CONSTRUCTION COSTS ($000)[a]

Item	Federal	Local	Total
General Navigation Features[b]	4,336	1,084	5,420
Local NED-associated costs[c]		4,937	4,937
Nav. aid - U.S. Coast Guard	8		8
Total NED costs	**4,344**	**6,021**	**10,365**

NED investment cost (includes interest during construction)	$10,658,000
Interest & amortization of NED investment cost	$833,800
Avg. annual NED maintenance cost	$28,400
Total average annual cost	$862,200
Average annual NED benefits	$1,695,400
Net annual NED benefits	$833,200
Benefit/cost ratio (7-5/8% int.; used to determine Federal interest)	2.0

[a] Basic assumptions:
(1) October 1995 price levels.
(2) 50-year project life.

[b] Cost sharing reflects provisions of the Water Resources Development Act of 1986.

[c] NED = National Economic Development.

GLOSSARY OF ABBREVIATIONS, ACRONYMS, AND SPECIALIZED TERMS USED IN THIS REPORT

ADF&G = Alaska Department of Fish and Game
ADOT/PF = Alaska Department of Transportation and Public Facilities
BCR = benefit/cost ratio
Continuing Authority = A program that permits the Corps to study, construct, and maintain projects for certain purposes without specific congressional authorization. Federal cost limits apply.
DPR = Detailed Project Report
ER = Engineering Regulation
FAA = Federal Aviation Administration
GI = General Investigations. This is the type of Corps study specifically authorized by Congress. (See Continuing Authority.)
ft = foot, feet
ft^2 = square foot, feet
ft^3 = cubic foot, feet
gal = gallon(s)
General Navigation Features = Features of a project which can be paid for in part by the Federal Government through the Corps of Engineers. A breakwater is a general navigation feature.
H = horizontal
h = hour(s)
H_s = significant wave height
lb = pound(s)
LERRD = lands, easements, rights-of-way, relocation, and disposal areas
MLLW = mean lower low water
mi/h = miles per hour
mo = month(s)
NED = National Economic Development. NED features of a project are those that increase the net value of goods and services provided to the economy of the United States as a whole.
NEPA = National Environmental Policy Act
O&M = operation and maintenance
OMRRR = operation, maintenance, repair, replacement, and rehabilitation
PED = preconstruction engineering and design
PL = Public Law
SPM = *Shore Protection Manual*
T_s = period (time interval between waves) of the significant wave
USCG = U.S. Coast Guard
USFWS = U.S. Fish and Wildlife Service
V = vertical
yd^3 = cubic yard, yards
yr = year(s)

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
cubic yards per year	0.7646	cubic meters per year
Fahrenheit degrees	5/9	Celsius degrees*
feet	0.3048	meters
feet per second	0.3048	meters per second
inches	2.54	centimeters
knots (international)	0.5144444	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
yards	0.9144	meters

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

CHIGNIK, ALASKA
SMALL BOAT HARBOR
INTERIM FEASIBILITY REPORT

1. INTRODUCTION

1.1 Study Authority

The present study was authorized by a resolution adopted December 2, 1970, by the Committee on Public Works of the U.S. House of Representatives. The resolution states:

> *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 Corps of Engineers had previously conducted a preliminary study of navigation problems at Chignik under authority of Section 107 of the River and Harbor Act of 1960, as amended. This study, resulting in the "Small Boat Harbor Final Detailed Project Report and Environmental Impact Statement, Chignik, Alaska," was completed in January 1988 in response to a request from the Chignik Village Council. Information from this previous study was used extensively in the current General Investigations (GI) feasibility study.

1.2 Scope of the Study

This study investigates the feasibility of navigation improvements at the city of Chignik, a fishing, fish processing, and subsistence community on the south side of the Alaska Peninsula. The investigation was limited to means of satisfying immediate and future needs for small craft refuge within the study area. Alternatives for

meeting these needs were evaluated under the Principles and Standards of the Water Resources Council for sound engineering design and for their economic, environmental, and cultural acceptability. Based on these evaluations, the best plan for navigation improvements is recommended.

1.3 Study Participants and Coordination

The Alaska District of the Corps of Engineers has primary responsibility for this study. The report was prepared with the assistance of the following: Alaska Department of Transportation and Public Facilities (ADOT&PF), U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), City of Chignik, Kodiak harbormaster, Alaska State Historic Preservation Officer (SHPO), U.S. Public Health Service (PHS), Federal Aviation Administration (FAA), Sealaska Corporation, Chignik Pride, Bristol Bay Native Corporation, Farwest Inc., Congressman Don Young, U.S. Senators Frank Murkowski and Ted Stevens, National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADF&G), and U.S. Coast Guard (USCG). Public meetings on this project were held in Chignik in June 1981, April 1982, June 1983, August 1984, May 1985, and March 1986. It has also been discussed frequently at city council meetings since February 1992.

The FAA determined that the harbor plan described in this report would not adversely affect the use of airspace by aircraft. The Coast Guard has been kept informed of project planning and is aware that the harbor would need navigational aids. The State is committed to the study. The ADOT&PF provided designs and costs for the inner harbor float system and State lands for dredging disposal. The same agency conducted a seismic study of a potential quarry site and has shown willingness to pursue funding for the non-Federal costs of the project.

1.4 Previous Studies

1.4.1 Corps Investigations.

- "Chignik Harbor Reconnaissance Report," May 1979. This report recommended that no further investigations into providing a boat harbor for Chignik be conducted. Lack of a legally constituted sponsor and low estimated benefits were the reasons for the decision.

- "Chignik, Alaska Small Boat Harbor Section 107 Reconnaissance Report," December 1981. This report found that further study was warranted based on a reevaluation of the benefits and the community of Chignik becoming recognized as a legal sponsor under Alaska law.

- "Chignik, Alaska Small Boat Harbor Section 107 Expanded Reconnaissance Report," September 1983. This report found the construction of a small boat harbor at Chignik to be technically possible and economically justified. Various environmental concerns were outlined. The study concluded that work leading to a Detailed Project Report should be undertaken.

- "Chignik, Alaska Small Boat Harbor Final Detailed Project Report and Environmental Impact Statement," January 1988. This report recommended a plan for construction of a boat harbor at Chignik under the authority of Section 107 of the River and Harbor Act of 1960, as amended. Harbor designs were considered for four sites; a plan at site 2, near the airport, was chosen. The total project would cost $10 million (1986 dollars) to construct; the Corps was authorized to expend no more than $4 million.

- A geotechnical drilling program was conducted in the summer of 1988 at the site recommended in the January 1988 report. The exploration did not find any bedrock in the harbor basin area. The bore hole logs are included in Appendix C, Geotechnical Analysis.

1.4.2 Studies by Others.

- "Chignik Harbor Study," ADOT&PF, August 1982. The State's report recommended development of the same site that the Corps of Engineers selected in its 1981 Reconnaissance Report.

- "Chignik," "Chignik Lagoon," and "Chignik Lake," community profiles originally compiled by Environmental Services Limited for the Alaska Department of Community and Regional Affairs in December 1982. These documents describe the communities and their economy and environment. They are kept current in the Alaska State Library Educational Doorway (SLED) on the Internet.

- "Chignik Small Boat Harbor Planning Aid Report," USFWS, Western Alaska Ecological Services, Anchorage, September 1984.

- "Rock Resource Study, Chignik Small Boat Harbor," Woodward-Clyde Consultants, April 1985. This report presents the selection of a potential quarry site and alternative sites 25 miles from Chignik, where armor rock could possibly be obtained to construct the breakwater.

- "Geophysical Investigation, Proposed Small Boat Harbor, Chignik, Alaska," Woodward-Clyde Consultants, June 1985. This report summarizes subbottom profiling and side scan sonar analysis performed at the various alternative harbor sites.

- "Geophysical Investigation, Castle Bay Quarry Site, Chignik, Alaska," Harding Lawson Associates (HLA job no. 05535,015.08) for the ADOT&PF, August 28, 1986. This report is a seismic study of rock at this potential quarry site.

Measurement Research Corporation initiated a wave study at Chignik for the ADOT&PF in May 1987 by installing a pressure transducer at the selected harbor site.

2. PROBLEM IDENTIFICATION

2.1 Existing Conditions

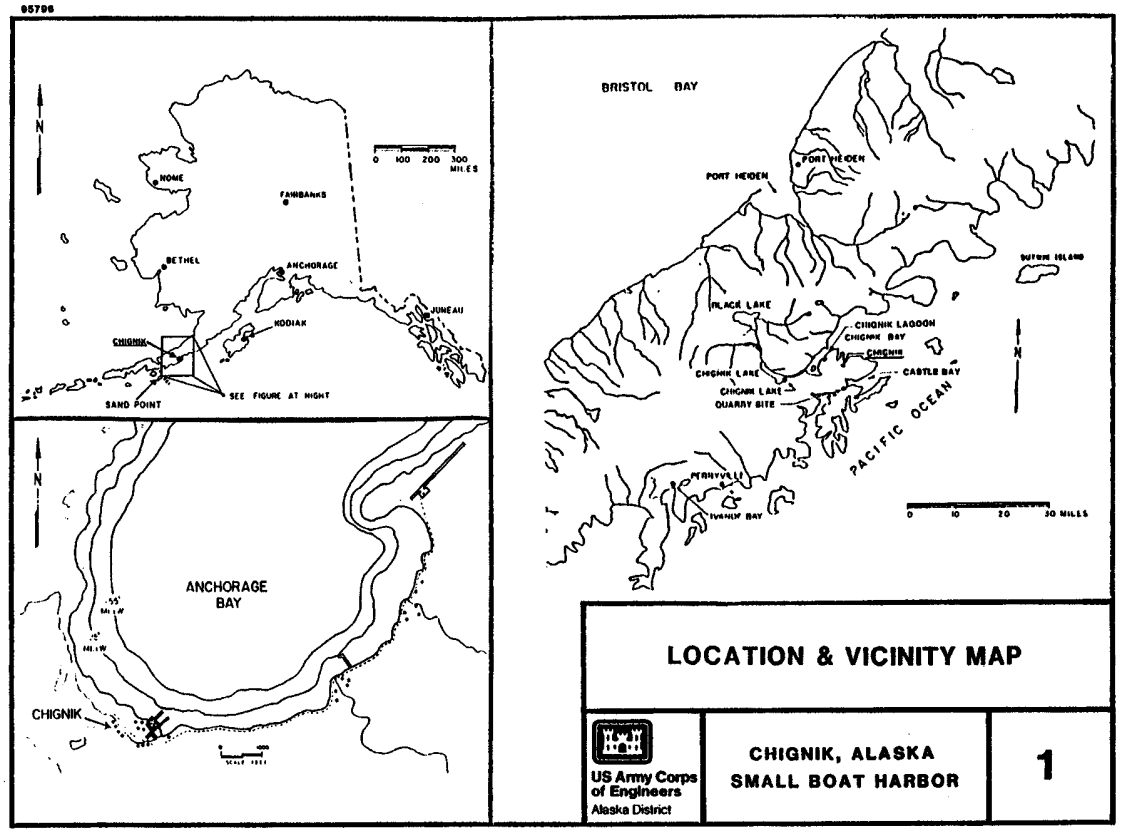
2.1.1 Regional Profile. The city of Chignik is situated on the south side of the Alaska Peninsula at the head of Anchorage Bay. It is approximately 250 miles southwest of Kodiak Island by air and about 450 miles southwest of Anchorage, at 56°18' north latitude and 158°24' west longitude (figure 1). Chignik is surrounded by the steep mountains of the Aleutian Range and is accessible only by water or air. The area around the community is characterized by long mountain slopes containing many streams, supporting alpine tundra at higher elevations and alder-willow scrub below. Depressions in the rolling slopes contain muskeg. Coastal flooding is estimated to occur once in 40 to 60 years. Neither erosion nor permafrost is a problem in Chignik.

Chignik had 191 year-round residents in 1994, according to the Alaska Department of Community and Regional Affairs (ADCRA). The population swells to near 800 during the summer salmon season. When cod prices are high and there is a cod fishery in winter, the winter population increases to 400.

Climate. Chignik has a maritime climate characterized by relatively cool, rainy summers and relatively warm winters. The mean daily temperature ranges from about 40 to 60 °F in the summer, and from approximately 20 to 40 °F during the winter. The highest recorded temperature is 76 °F; the lowest is -12 °F.

Thick cloud cover and heavy winds limit travel to and from Chignik, especially in the winter. During the winter, Chignik experiences from 35 to 45 days of adverse weather and rough seas. In summer, approximately 15 to 20 days are stormy. Total precipitation averages 130 inches annually; average annual snowfall is 60 inches. Improved weather data will soon be available from a recently installed automated weather observation system.

The average windspeed at Chignik is estimated at 10 miles per hour (mi/h). Residents say winds generally blow from the northwest, but the direction often


95796
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HOME
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PORT HEIDEN
PORT HEIDEN
BLACK LAKE
CHIGNIK LAGOON
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CASTLE BAY
CHIGNIK LAKE
QUARRY SITE
PACIFIC OCEAN
PERRYVILLE
IVANOF BAY
N
0 10 20 30 MILES
LOCATION & VICINITY MAP
US Army Corps of Engineers
Alaska District
CHIGNIK, ALASKA
SMALL BOAT HARBOR
1

changes quickly. Sudden violent gusts of cold air, called williwaws, are common. Wind with gusts exceeding 100 mi/h may blow from the southwest through the mountain passes when there is a large pressure differential between Bristol Bay and the North Pacific Ocean.

Natural Resources. Bituminous and lignite coal deposits lie on the west shore of Chignik Bay. Mining of these deposits was attempted from 1899 to 1915; however, transportation and access problems make development of these deposits economically infeasible at this time. Sand and gravel are obtained locally from sites near Peter Pan Creek and the mouth of Indian Creek.

All five species of Pacific salmon occur in the waters around Chignik. The Chignik River drainage produces the largest sockeye (red) salmon runs on the south side of the Alaska Peninsula, and the only chinook (king) salmon run on the southern peninsula. Halibut, herring, Pacific cod, rock sole, sablefish, starry flounder, arrowtooth flounder, and several species of smelt are found offshore, along with king, tanner, and Dungeness crab, scallops, and shrimp.

Marine mammals that inhabit the waters around Chignik include sea otter, harbor seal, Steller sea lion, and gray whale.

Furbearers and small game animals in the Chignik region include moderate numbers of red fox, porcupine, lemming, tundra vole, arctic ground squirrel, weasel, mink, wolverine, and tundra hare. The beaver, muskrat, land otter, snowshoe hare, hoary marmot, and a small number of wolves also inhabit the region. The area supports a small but stable moose and caribou population. Brown bear are numerous throughout the region.

About 250 species of birds occur around Chignik, predominately marine and passerine species. Of these, only the Aleutian Canada goose is considered to be threatened or endangered.

Economic Base. The Chignik economy is dominated by the fishing industry. Salmon is the dominant species taken and processed. During the summer salmon season from June to September, jobs are plentiful in Chignik. During this

period, virtually every Chignik resident willing to work is in involved in fishing or ancillary activities. However, fewer than 25 full-time jobs are available year-round.

Most residents are involved in fish harvesting. Most jobs at the shore-based seafood processing facilities are held by transient workers. Employment is 650 people from June through August.

Since limited entry into the salmon fisheries was implemented in 1975, Chignik has been Alaska's most productive fishing area on the basis of revenue per vessel. Over the past 10 years, the local fleet has harvested more than 2.6 million salmon per year. During the 1994 season, 105 purse seine vessels participated in the salmon fishery.

Residents of all five towns in the Chignik Economic Zone (Chignik, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay) fish the same waters, harvest the same resources, share a similar historical and cultural background, and have close family ties. Chignik, the only community in the region incorporated as a city, is the primary focus of this report. However, vessel owners who reside in the other four communities support the harbor project directly and through the Lake and Peninsula Borough.

The potential salmon fishing season is 120 days, with only 60 days actually open fishing periods. The season is closely monitored and regulated by the ADF&G, which sets open and closed periods according to pre-estimated escapement quotas. Vessels usually spend the closed periods in port or at sea riding out storms.

Entry into the salmon fishing industry is extremely difficult because a permit must be purchased from an existing holder. Chignik city officials estimate that a seine permit currently has a market value of $225,000.

2.1.2 Local Concerns. At public meetings, community leaders and citizens said construction of a harbor was a primary capital project priority. According to residents who led in its incorporation, the reason Chignik became incorporated as a city was to be eligible for assistance from a large number of sources, primarily the U.S. Army Corps of Engineers and the State of Alaska, to construct a harbor. The community is conducting a public dock feasibility study and is requesting funds for a final design.

2.2 Problems, Needs, and Opportunities

2.2.1 Problems. There are no protected moorages available in Anchorage Bay, the site of the city of Chignik, to accommodate the relatively large salmon and crab fleets that operate in the area. In summer, approximately 40 vessels tie against Aleutian Dragon Fisheries (ADF), the in-town cannery dock, during closed fishing periods. These vessels, averaging about 42 feet in length, stack six to seven deep, sometimes more (figure 2). Up to 20 additional vessels moor at the smaller dock at Chignik Pride. This dock can accommodate from 15 to 25 vessels for a short time.

Because neither dock provides protection during storms or rough seas, vessels must move from the docks to a semiprotected area on the northeast corner of Anchorage Bay during those periods. Unfortunately, this semiprotected area is just off the end of the airport runway; the vessel masts present hazards to aircraft on takeoff and approach. Also, because of the absence of a protected harbor in the area, virtually the entire salmon fleet must either dry-store during the off-season or travel to distant home ports for wet storage. By having vessels in a protected harbor, local residents

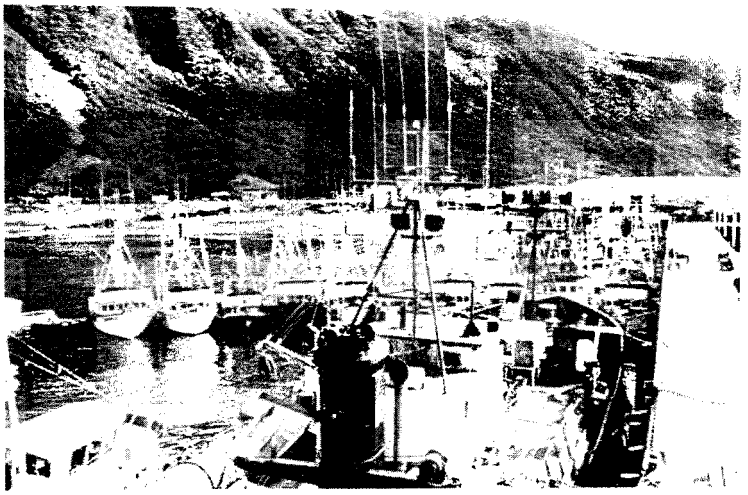


FIGURE 2.--Vessels stack more than 10 deep along the in-town pier at Chignik.

would be able to take advantage of short periods of good weather to extend their subsistence harvest of various species to the winter months.

In the fall and spring, when a number of larger crab vessels operate in the area, they experience similar overcrowding and inconvenience at the docks of the two processors in Chignik. These vessels also must travel considerable distances for temporary storage during the off-season because of inadequate facilities in Chignik.

2.2.2 Harbor Needs. An analysis of the various fishing activities conducted in the Chignik area and the fishing fleets operating from Chignik indicates a moorage demand of about 105 commercial fishing vessels. It is estimated that 74 salmon vessels between 31 and 55 feet long and about 31 crab vessels from 56 feet to more than 120 feet long would use harbor facilities in Chignik, if available. Details of fishing activities and fleet compositions in the Chignik area are in appendix B. In addition to the needs of fishing vessels, a public dock is also needed to accommodate tankers and freighters that deliver fuel and goods. Coastal Transportation provides scheduled weekly small freighter service. Western Pioneer, Inc., provides barge service on call to the area. The State ferry *MV Tustumena* operates in the region from April through October, stopping at Chignik at least six times during the salmon season.

2.2.3 Opportunities. Opportunity for water-related development could be encouraged by local interests working in cooperation with State and area agencies to build and maintain the basic slips and floats needed to accommodate the present and future fleet. The agencies and local governments are preparing to provide the standard services, fuel, water, electricity, and fire protection. The city, private contractors, and businesses would be responsible for managing other onshore services needed to refuel, maintain, and supply boats using the harbor. A dock, fuel storage and dispensing facility, staging area, and storage area are being planned at a site southwest of the proposed harbor. The staging and storage areas would accommodate stored equipment (such as crab pots) and other harbor-related activities.

2.3 Future Conditions

Without improved harbor conditions in Chignik, the fleets catching crab, salmon, halibut, cod, and other species would continue to use the existing unprotected docks.

This continued use of the unprotected docks results in a considerably less efficient overall harvesting operation than if protected harbor facilities were available. Without improvements, vessels would continue to incur minor damages while stacking against these docks during closed periods. Boats of all fleets in need of wet storage during the off-season would continue to incur significant transportation costs by having to return to a more distant port. Vessels would also incur considerable operating expenses while riding out storms in Anchorage Bay away from the docks. (See figure 3.) The fishing industry would probably be primarily limited to salmon, with only a few vessels finding it worthwhile to fish cod and other species. The long-term production level would stay approximately the same.

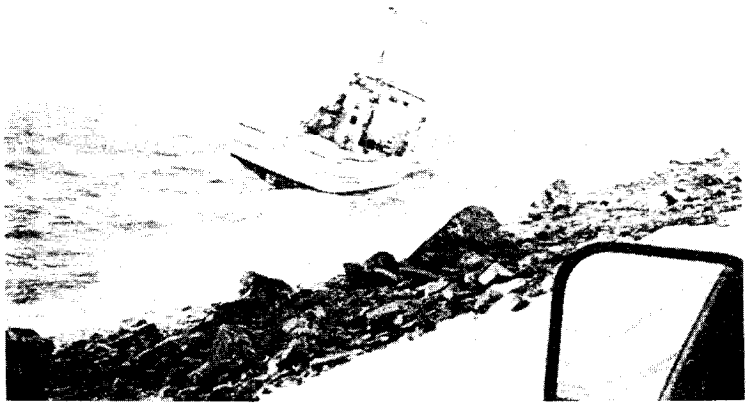


FIGURE 3.--Vessel is grounded at Chignik while attempting to ride out a storm.

3. PLAN FORMULATION

3.1 Planning Criteria

3.1.1 National Economic Development Objective. The Federal objective of water and land resources planning is to contribute to the National Economic Development (NED) in a way that is consistent with protecting the Nation's environment. NED features are those that increase the net value of goods and services provided to the economy of the United States as a whole. Only benefits contributing to the NED may be claimed for economic justification of the project. For the Chignik harbor, NED features include the breakwater, channels, basins, and float system.

Resource planning must be consistent with the NED objective and must consider economic, social, and environmental as well as engineering factors. The following criteria are guidelines for developing alternative plans and are used to evaluate those plans.

3.1.2 Engineering Criteria. The plans should be adequately sized to accommodate present and future user needs and provide for development of harbor-related facilities. They should protect against wind-generated waves and boat wakes. The moorage demand at Chignik is approximately 105 spaces. Adequate depths and entry are required for safe navigation. Alternative plans must also be suitable for construction.

3.1.3 Economic Criteria. All alternatives considered to meet project needs should be presented in quantitative terms where possible. Benefits attributed to a plan must be expressed in terms of a time value of money, and must exceed equivalent economic costs for the project. To be economically feasible, each separate portion or purpose of the plan must provide benefits at least equal to the cost of that unit. The scope of development must be such that benefits exceed project costs to the maximum extent possible. The economic evaluation of alternative plans is on a common basis of October 1995 prices, a project life of 50 years, and an interest rate of 7-5/8 percent.

3.1.4 Environmental Criteria. Environmental considerations include identifying forms of aquatic life and wildlife that might be impacted by a plan's implementation, minimizing disruption of the area's natural resources, maintaining consistency with the Alaska Coastal Management Plan, and using measures to protect or enhance existing environmental values.

Since the Chignik harbor project would constitute a major Federal action, an Environmental Impact Statement (EIS) was prepared. A major concern was the large amount of dredging in a marine habitat near shore with abundant and diverse animal life. The breakwater presents concerns of fish migration disruption, as the harbor is sited in a salmon rearing area. Disposing of the large amounts of excess dredged material was also a major concern.

An EIS was in the January 1988 Detailed Project Report. Although resource agencies reviewed this EIS, it was not completed because of subsequent changes in the Alaska District's quarry policy. A final supplemental EIS is included with this report. Comments received in response to the draft supplemental EIS, with Corps responses where appropriate, are in appendix D.

3.1.5 Social Criteria. Plans considered must minimize adverse social impacts and must be consistent with State, regional, and local land use and development plans, both public and private. The selected plan must be acceptable to the non-Federal sponsor.

3.2 Description of Alternative Plans

3.2.1 No Action. If no Federal action were taken, damage would continue as described in subsection 2.2.1, Problems. Due to the lack of moorage facilities close to Chignik, some boats would return annually to distant harbors, as far away as the Pacific Northwest, at considerable cost for fuel and vessel maintenance. Other boats would seek shelter at Chignik behind the spit adjacent to the airport, though losses and damages would continue to be high.

3.2.2 Nonstructural Alternatives. There are two main nonstructural alternatives for fishing vessel operators:

a. Remove the vessels from the water, or
b. Seek shelter in other waters.

Dry docking damages vessels and causes their owners to incur expense. In addition, the boats are not available for winter use in the crab, bottomfish, herring and other fisheries.

Likewise, leaving Chignik for other waters is not a good alternative. This practice is already occurring, as discussed in Appendix B, Economic Analysis. The costs of traveling are high, and the boats are not readily available throughout the year. The local economy suffers as a result.

3.2.3 Structural Alternatives. Moorage space is needed for approximately 105 commercial vessels ranging from 31 ft to more than 120 ft in length. Drafts required for these vessels range from about 3 ft to 12 ft. The estimated distribution of boats by size and type is shown in table 1.

TABLE 1.--*Moorage demand estimate*

Vessel length (ft)	No. of vessels
31-45	51
46-55	23
56-85	13
86-120	18
TOTAL	105

A smaller harbor that would protect only part of the fleet was considered in the preliminary stages of study. Significant cost reductions would be possible by accommodating fewer large vessels. However, the incremental reduction in benefits associated with reducing moorage slips for the larger vessels was greater than the saved costs. A small portion of the lost benefits could be salvaged in a reduced harbor design if mooring dolphins were installed outside the harbor for the large vessels, but storm damage to the dolphins and vessels would be high. Placing the dolphins behind the land spit on the northeast entrance to the bay would be prohibited because the area lies off the end of the airport runway; vessel masts would interfere with planes taking off and landing. The site is physically constrained by small streams at each end.

Harbor designs were considered for four sites in the Chignik area (figure 4). Sites 1 and 4 were eliminated early in the study following preliminary evaluation. Each of the detailed plans prepared for sites 2 and 3 was designed for the 50-year wave, which was found to be 6 feet for site 2 and 8.5 feet for site 3.

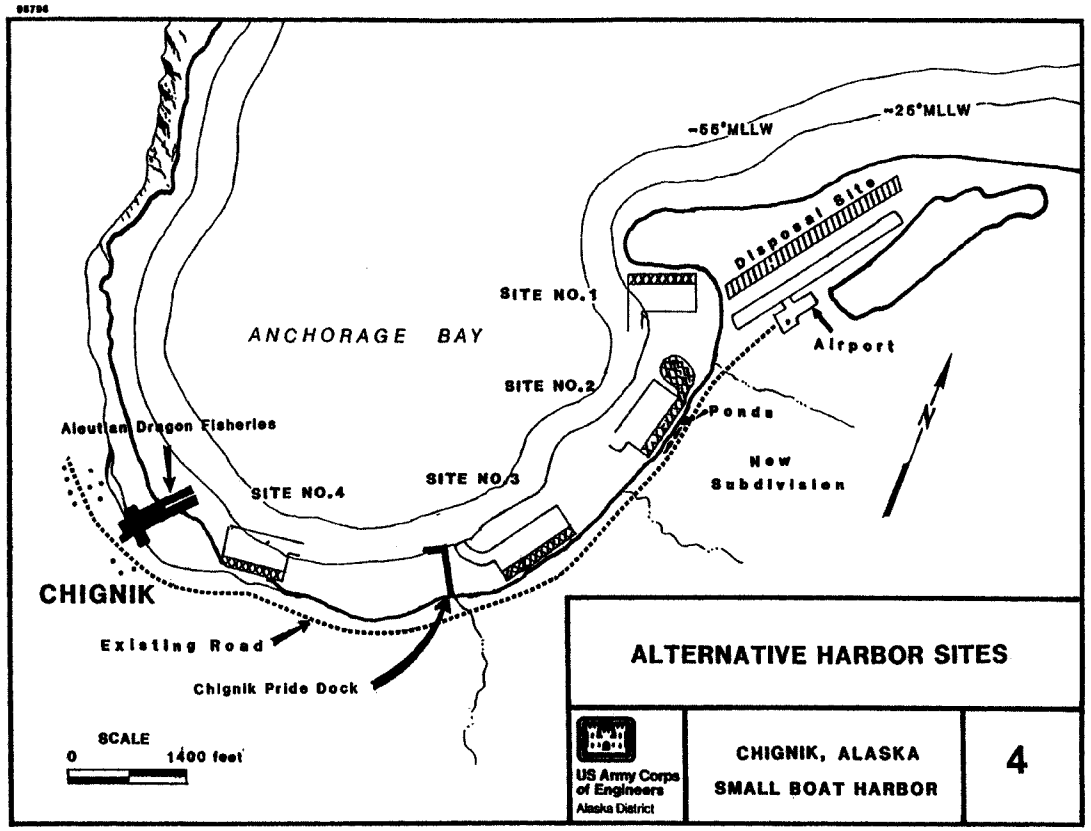
Site 1. This site is located near the airport just inside the land spit on the northeast entrance to the bay. (See figure 4.) The land spit would be used as a natural breakwater. Further breakwater configuration would be designed to enclose a harbor area just inside the spit. A floating breakwater was considered, but the long period associated with the design wave would require an abnormally large floating breakwater.

A rubble mound would be inappropriate because the ocean bottom drops off rapidly close to shore, leaving insufficient area at a suitable depth for a harbor basin. If the breakwater were constructed in the deep water to enclose sufficient basin area, the volume of required rock would be unusually large, making the cost prohibitive.

Locating the harbor near the airport would create numerous safety hazards. According to the FAA, an obstruction 20 feet from the end of the runway must be no more than 1 foot high; an obstruction 40 feet from the end, 2 feet high, and so on. Even if the harbor were designed to avoid being in the direct approach to the runway, the concentration of boats in that area might mean that obstructions such as masts or antennas would protrude into the approach path. In addition, access to the boat harbor from town would require a new road across the end of the runway, with insufficient aircraft clearance over passing automobiles. This congestion of traffic would be highly undesirable.

The hazards of locating the harbor near the airport and a lack of area for a basin that could be enclosed in an economically feasible rubblemound breakwater are major problems with this site. The site was not considered in detail because of these problems.

Site 2. This site (figure 4) is adjacent to the airport right-of-way and between the deltas of two small streams. Two harbor planforms, 2A and 2B, were


95796
-55'MLLW
-25'MLLW
Disposal Site
Airport
SITE NO.1
ANCHORAGE BAY
SITE NO.2
Ponds
Aleutian Dragon Fisheries
New
Subdivision
SITE NO.4
SITE NO.3
CHIGNIK
Existing Road
Chignik Pride Dock
SCALE
0
1400 feet
ALTERNATIVE HARBOR SITES
US Army Corps
of Engineers
Alaska District
CHIGNIK, ALASKA
SMALL BOAT HARBOR
4

examined for this site; they are described in detail in appendix A. Plan 2A was the design presented in the January 1988 Chignik DPR. It would consist of a rubblemound breakwater parallel to shore in a water depth of approximately 5 feet at MLLW, creating an 805x350-foot rectangular basin and access channel. A staging area would be built at the north end with an opening to allow fish passage. An entrance channel would make a 90-degree bend around the south end of the breakwater. This plan would have a long entrance channel and access channel into the basin. Plan 2A would have a capacity for 70 vessels and would require maintenance dredging, due to the stream on the south end depositing sediment directly into the access channel.

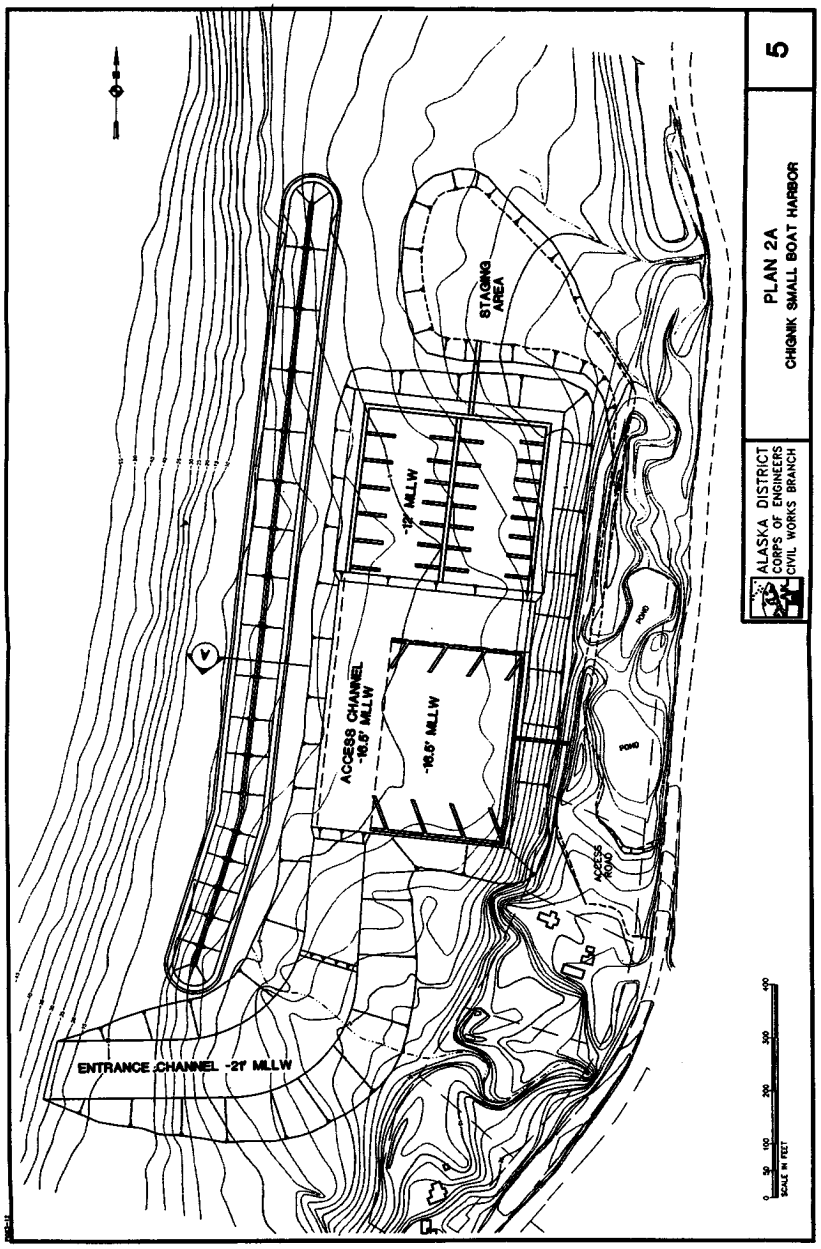
Plan 2A (figure 5) requires the dredging of approximately 360,000 cubic yards (yd^3) of mostly sandy material, including an estimated 0.5 percent dredged shale bedrock. Approximately 96,000 yd^3 of this material would be used to construct the 4-acre staging area. The 264,000-yd^3 balance would be disposed of in a 240-foot-wide mound, 20 feet high and 2,000 feet long, between the airport northwest boundary and a line 250 feet from the runway center line (figures 2, 9, and EIS-3). The breakwater would consist of 20,000 yd^3 of armor rock between 2,500 and 4,000 pounds (lb), 19,000 yd^3 of secondary rock between 300 and 1,700 lb, and 21,000 yd^3 of core material up to 300 lb. Another 15,700 yd^3 of secondary rock would be required to armor the staging area and to line the outer section of the entrance channel. Maintenance dredging of 16,000 yd^3 would be required about every 10 years. The detailed cost estimate for plan 2A is shown in table 2.

Plan 2B is a layout suggested by the Alaska Department of Transportation and Public Facilities (ADOT&PF). It would consist of an enclosed basin with the entrance channel in the center. The entrance channel would be straight, short, and would lead directly into the moorage basin. No access channel would be needed. This breakwater generally would follow the -5-ft-MLLW contour, but one breakwater head would extend to depths of 20 feet at MLLW. This layout would accommodate 105 vessels and would not require any maintenance dredging. Most of the breakwater would be sited in shallow water, thus providing an 8-foot-wide bench around the breakwater between 0 and +5 ft MLLW. This bench, constructed of "B" stone, would be the natural toe of the breakwater.

TABLE 2.--*Detailed cost estimate, plan 2A*
(October 1995 price level)

Item	Qty.	Unit	Unit price ($)	Shared NED costs ($000)[a] Federal	Local	TOTAL
Mobilization & demob.	1	LS	699,000	299	400	699
Breakwater						
Armor rock	20,000	yd^3	74	1,176	294	1,470
Secondary rock	19,000	yd^3	37	565	141	706
Core (quarry run)	21,000	yd^3	25	423	106	529
Hydrographic surveys	2	ea	19	30	8	38
Navigation aid foundation	2	ea	3	5	1	6
Entrance and access channel						
Dredging	185,050	yd^3	5.81	860	215	1,075
Armor rock (810#)	5,800	yd^3	37	172	43	215
Filter rock (9.5#)	1,900	yd^3	25	38	10	48
Float system						
Concrete floats	22,835	ft^2	30		685	685
Piles	100	ea	2,900		290	290
Gangways	2	ea	41,000		82	82
Dolphins	8	ea	10,000		80	80
Approaches	2	ea	45,000		90	90
Utilities (power, lights)	1	LS	248,000		248	248
Moorage basin						
Dredge sand	175,000	yd^3	5.81		1,017	1,017
Staging area						
Secondary rock	6,700	yd^3	37		249	249
Disposal of dredgings						
Fence	1	LS	35,000		35	35
SUBTOTAL				3,568	3,994	7,562
Contingency				881	537	1,418
CONSTRUCTION CONTRACT				4,449	4,531	8,980
Lands and damages				72	73	145
Engineering and design				158	257	415
Supervision and administration				262	282	544
Navigation aids (U.S. Coast Guard)				8		8
TOTAL PROJECT COST				4,949	5,143	10,092
Total NED construction cost						10,092
NED interest during construction (7-5/8%, 9 mo.)						285
NED investment cost						**10,377**
Annual NED cost ($)[b]						**$860,800**

[a] Features showing Federal costs are General Navigation Features. These can be paid in part by the Federal Government, subject to current cost-sharing laws and the Federal cost limit (subsection 5.7.4).
[b] Includes $49,000 operation and maintenance.


ENTRANCE CHANNEL -21' MLLW
ACCESS CHANNEL -16.5' MLLW
-16.5' MLLW
-12' MLLW
STAGING AREA
ACCESS ROAD
ALASKA DISTRICT
CORPS OF ENGINEERS
CIVIL WORKS BRANCH
PLAN 2A
CHIGNIK SMALL BOAT HARBOR
5
SCALE IN FEET
0 50 100 200 300 400

Plan 2B (figure 6) requires dredging approximately 317,600 cubic yards (yd^3) of mostly sandy material. Approximately 35,800 yd^3 of this material would be used to construct a 2.3-acre staging area. As in plan 2A, the balance of 281,800 yd^3 would be disposed of in a mound between the airport northwest boundary and a line 250 feet from the runway center line (figures 2 and 9). The two breakwaters would consist of 22,400 yd^3 of armor rock weighing between 2,500 and 4,000 pounds, 21,600 yd^3 of secondary rock between 300 and 1,700 pounds, and 24,000 yd^3 of core material consisting of stones up to 300 pounds. (An alternative design using 7,400 concrete Core-Loc armor units weighing 3,000 pounds each is also possible.) The detailed cost estimate for plan 2B is shown in table 3.

The location of the entrance channel for both plans is constrained by the streams at both ends of the basin and by the 1,000-foot clear zone for the airport. The tall masts of vessels that would use the harbor, about 45 feet above MLLW at high tide, would interfere with aircraft if the channel extended into the clear zone.

Site 3. This site (figures 2 and 7) is located north of the pier and stream mouth at Chignik Pride dock and south of the stream mouth that marks the southern boundary of site 2. Two factors tend to raise breakwater quantity requirements. First, the ocean bottom drops to more than -40 ft MLLW fairly close to shore, leaving only a thin band of area between shore and the breakwater. This makes the basin relatively long and narrow, requiring a long breakwater. Second, a submarine trench lies perpendicular to shore near the middle of the shoreline in the site, leaving inadequate area for basin development either north or south of the trench. Building a breakwater across the trench would effectively increase the breakwater height to 40 feet. About 500 feet of breakwater would be affected.

Similar to the site 2A plan, the site 3 plan would feature a rectangular basin and access channel totaling 6.5 acres. Vessels longer than 60 feet would have diagonal stalls. The small vessels would be parked in stalls perpendicular to the walkway floats. The harbor would be dredged to depths of 12 feet at MLLW for the shallow part of the basin up to 22 feet at MLLW for the deepest portion of the channel. The plan requires dredging approximately 212,000 yd^3 of mostly sandy material, including an estimated 0.5 percent dredged shale bedrock. All except 3,000 yd^3 of this material would be disposed of in a mound between the airport northwest boundary and a line 250 feet from the runway center line (figures 2, 9, and EIS-3). This mound would be

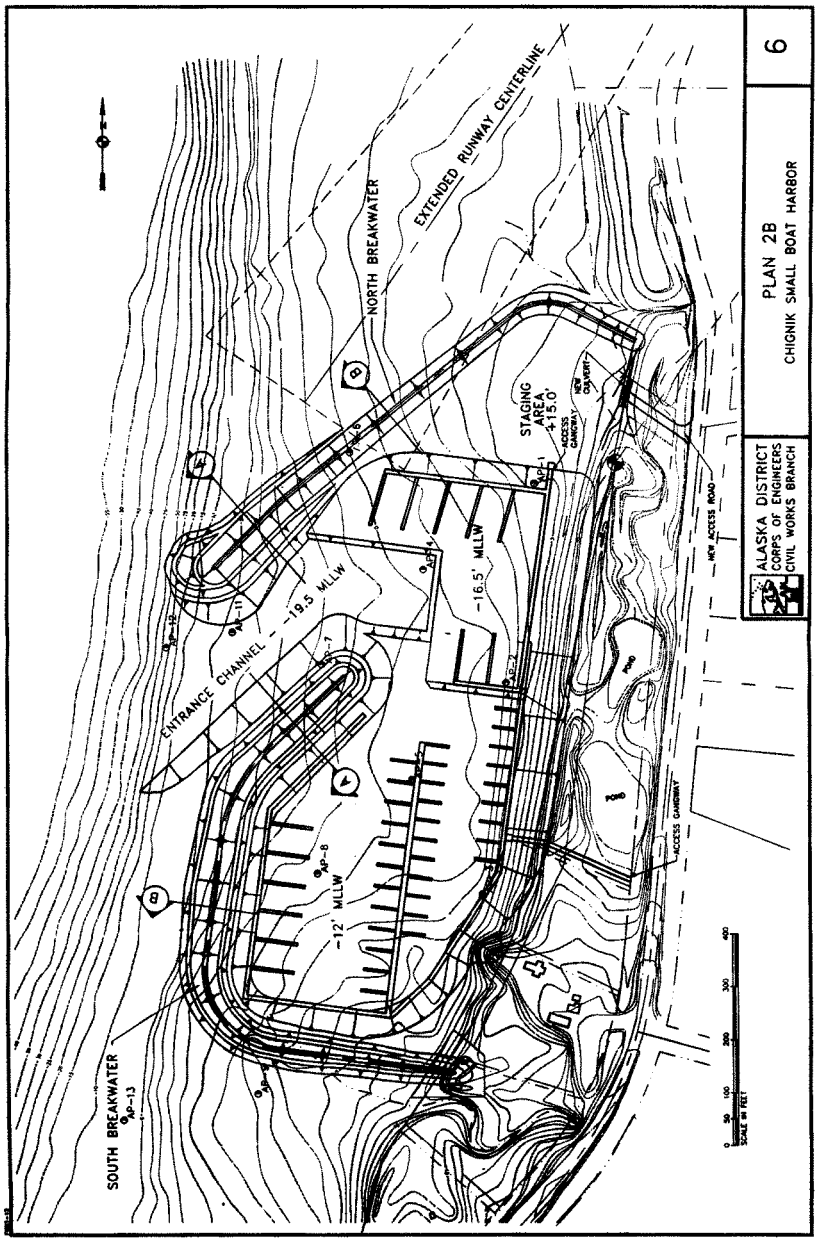
Table 3.--*Detailed cost estimate, plan 2B*
(October 1995 price level)

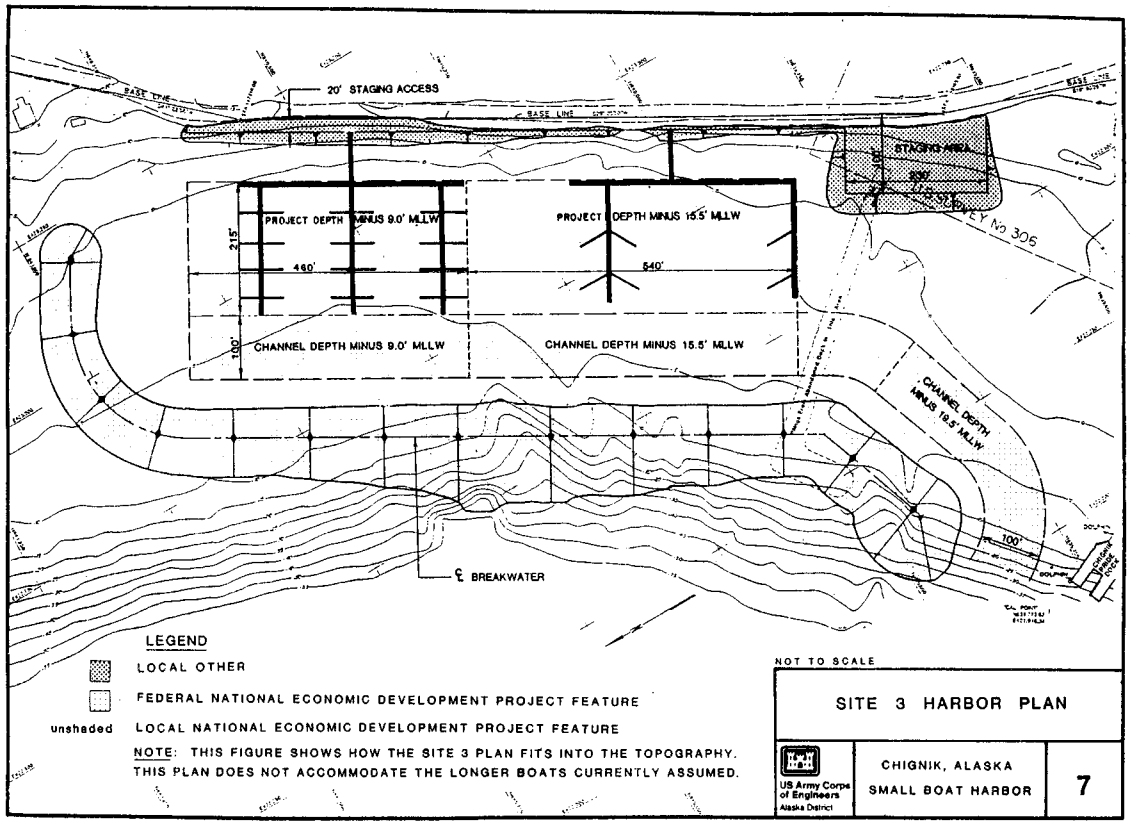
Item	Qty.	Unit	Unit price ($)	Federal	Shared NED costs ($000)a Local	TOTAL
Mobilization & demob.	1	LS	699,000	299	400	699
Breakwater						
Armor rock	22,400	yd3	74	1,318	329	1,647
Secondary rock	21,600	yd3	37	642	160	802
Core (quarry run)	24,000	yd3	25	484	121	605
Hydrographic surveys	2	ea	19	30	8	38
Navigation aid foundation	2	ea	3	5	1	6
Entrance and access channel						
Dredging	65,600	yd3	5.81	305	76	381
Float system						
Concrete floats	43,312	ft2	30		1,299	1,299
Piles	157	ea	2,900		455	455
Gangways	2	ea	41,000		82	82
Approaches	2	ea	45,000		90	90
Utilities (power, lights)	1	LS	248,000		248	248
Moorage basin						
Dredging	252,000	yd3	5.81		1,465	1,465
Disposal of dredgings						
Fence	1	LS	35,000		35	35
SUBTOTAL				3,083	4,769	7,852
Contingency				761	640	1,401
CONSTRUCTION CONTRACT				3,844	5,409	9,253
Lands and damages				10c	135	145
Engineering and design				158	257	415
Supervision and administration				262	282	544
Navigation aids (U.S. Coast Guard)				8		8
TOTAL PROJECT COST				4,282	6,083	10,365
Total NED construction cost						10,365
NED interest during construction (7-5/8%, 9 mo.)					293	
NED investment cost						10,658
Annual NED cost ($)b						$862,200

a Features showing Federal costs are General Navigation Features. These can be paid in part by the Federal Government, subject to current cost-sharing laws and the Federal cost limit (subsection 5.7.4).

b Includes $28,400 operation and maintenance.

c Administration and review.


EXTENDED RUNWAY CENTERLINE
NORTH BREAKWATER
SOUTH BREAKWATER
ENTRANCE CHANNEL
-19.5 MLLW
-12' MLLW
-16.5' MLLW
STAGING AREA 4-15.0'
ACCESS GANGWAY
NEW GANGWAY
NEW ACCESS ROAD
SCALE IN FEET
ALASKA DISTRICT
CORPS OF ENGINEERS
CIVIL WORKS BRANCH
PLAN 2B
CHIGNIK SMALL BOAT HARBOR
6


20' STAGING ACCESS
BASE LINE
STAGING AREA
PROJECT DEPTH MINUS 9.0' MLLW
PROJECT DEPTH MINUS 15.5' MLLW
215'
460'
540'
100'
CHANNEL DEPTH MINUS 9.0' MLLW
CHANNEL DEPTH MINUS 15.5' MLLW
CHANNEL DEPTH MINUS 18.5' MLLW
100'
℄ BREAKWATER
LEGEND
LOCAL OTHER
FEDERAL NATIONAL ECONOMIC DEVELOPMENT PROJECT FEATURE
unshaded LOCAL NATIONAL ECONOMIC DEVELOPMENT PROJECT FEATURE
NOTE: THIS FIGURE SHOWS HOW THE SITE 3 PLAN FITS INTO THE TOPOGRAPHY.
THIS PLAN DOES NOT ACCOMMODATE THE LONGER BOATS CURRENTLY ASSUMED.
NOT TO SCALE
SITE 3 HARBOR PLAN
US Army Corps of Engineers
Alaska District
CHIGNIK, ALASKA
SMALL BOAT HARBOR
7

240 feet wide, nearly 20 feet high, and 2,000 feet long. The breakwater would consist of 53,000 yd^3 of armor rock weighing between 4,000 and 6,700 pounds, 48,000 yd^3 of secondary rock between 350 and 4,000 pounds, and 60,000 yd^3 of core material. The core material would consist of stones up to 350 pounds. Maintenance dredging of 16,000 yd^3 would probably be required about every 10 years. Detailed costs of this plan are presented in table 4. Annual operation, maintenance, and replacement (OM&R) costs would be higher than those for site 2, because the replacement of armor stone would be almost doubled to reflect the increased volume of rock used to construct the breakwater. Also, maintenance dredging would be required.

A staging area could be located between the shoreline and the basin boundary. A small additional staging area could be provided on the side of the basin, although it should not protrude far from shore because USFWS guidelines restrict fill to waters above MLLW.

Site 4. This site is located at the south end of Anchorage Bay, just west of the cannery (figure 2). The location was chosen for its proximity to Chignik. Cliffs rise immediately out of the water at this site. The road that runs from the town to the airstrip is situated along the base of the cliffs. The cliffs are somewhat unstable; rocks fall occasionally and block the road. Due to the cliffs and road, the staging area would have to be built on intertidal and subtidal land. This would push the breakwater into deeper water, thus increasing the size and cost. For these reasons, site 4 was eliminated from further analysis.

TABLE 4.--*Detailed cost estimate, site 3 plan (October 1995 price level)*

Item	Qty.	Unit	Unit price ($)	Shared NED costs ($000)[a] Federal	Local	TOTAL
Mobilization & demob.	1	LS	699,000	299	400	699
Breakwater						
Armor rock	53,000	yd^3	74	3,117	779	3,896
Secondary rock	48,000	yd^3	37	1,427	356	1,783
Core (quarry run)	60,000	yd^3	25	1,209	302	1,511
Hydrographic surveys	2	ea	19	30	8	38
Navigation aid foundation	2	ea	3	5	1	6
Entrance and access channel						
Dredging/disposal	80,000	yd^3	5.81	372	93	465
Float system						
Concrete floats	20,015	ft^2	30		600	600
Piles	100	ea	2,900		290	290
Gangways	2	ea	41,000		82	82
Approaches	2	ea	45,000		90	90
Utilities (power, lights)	1	LS	248,000		248	248
Moorage basin						
Dredge/disp. sand	130,940	yd^3	5.81		761	761
Dredge/disp. rock	1,060	yd^3	21		22	22
Dredge disposal area						
Fence	1	LS	35,000		35	35
SUBTOTAL				6,459	4,147	10,606
Contingency				1,594	558	2,152
CONSTRUCTION CONTRACT				8,053	4,705	12,758
Lands and damages				72	73	145
Engineering and design				278	287	565
Supervision and administration				470	297	767
Navigation aids (U.S. Coast Guard)				8		8
TOTAL PROJECT COST				8,881	5,362	14,243
Total NED construction cost						14,243
NED interest during construction (7-5/8%, 9 mo.)						366
NED investment cost						14,609
Annual NED cost ($)[b]						$1,200,600

[a] Features showing Federal costs are General Navigation Features. These can be paid in part by the Federal Government, subject to current cost-sharing laws and the Federal cost limit (subsection 5.7.4).

[b] Includes $57,800 operation and maintenance.

4. COMPARISON OF PLANS AND SELECTION

4.1 Design Considerations

Sites 2 and 3 are both located where breakwaters can be built in relatively shallow water. Both sites have sufficient area to allow dredging of the mooring basin inside the breakwaters. (The cost of dredging sandy material is considerably less than building the breakwaters in deeper water.)

Site 2 was more aggressively studied after preliminary work revealed that the breakwater could be constructed on a relatively flat ocean bottom, avoiding construction in deep water. The cost associated with dredging the shallows that extend relatively far out from shore would be more than offset by the smaller quantities of rock needed for the breakwater. Site 2 was ultimately selected as the least expensive site to develop. The ocean floor at site 3 has a greater slope than at site 2, and there is a submarine trench extending perpendicular to shore near the center of the proposed breakwater. These factors both tended to result in greater rock quantities for a breakwater at site 3, increasing costs.

Two variations of the same basic plan were considered for site 2. Plan 2A, the recommended plan in the 1988 DPR, includes a detached breakwater and protection of the sandy entrance channel with armor rock. Plan 2B has two breakwaters with a central entrance channel between them. This plan would not require armor on the entrance channel, since it is located away from the stream. No maintenance dredging is anticipated for the same reason. The design for site 3 does not include the placement of rock in the entrance channel, because the banks would be deeper and less exposed to wave action. A comparison of the features and effects of the three plans is shown in table 5.

As discussed in appendix C, Chignik is located in the Shumagin Islands Seismic Gap, a high seismic risk zone with the possibility of a great earthquake occurring in the future. Smaller earthquakes (less than 7.0 on the Richter scale) are common throughout the region. Although there is no method of predicting whether a great

TABLE 5.--*Comparison of three alternatives*

	Plan 2A	Plan 2B	Site 3 plan (approximate)
Estimated NED construction cost (Oct 1995)	$10,092,000	$10,365,000	$14,243,000
Annual cost			
Annual investment cost (7-5/8% int., 50 yr)	$811,800	$833,800	$1,142,800
Average annual maintenance cost	49,000	28,400	57,800
Total average annual cost	$860,800	$862,200	$1,200,600
Annual benefits			
Average annual benefits	$1,413,500	$1,695,400	$1,413,500
Benefit/cost ratio	1.6 to 1	2.0 to 1	1.2 to 1
Net annual benefits	$552,700	$833,200	$212,900
Vessels accommodated	70	105	70
Dredged material source			
Mooring basin	175,000 yd^3	252,000 yd^3	132,000 yd^3
Access and entrance channel	185,000 yd^3	65,600 yd^3	80,000 yd^3
Dredged material use/disposal			
Staging area	96,000 yd^3	35,800 yd^3	3,000 yd^3
Disposal at airport site	264,000 yd^3	281,800 yd^3	209,000 yd^3
Area covered by dredgings	12 acres	12 acres	12 acres
Maintenance dredging of entrance channel (about every 10 yrs - disposal at airport site)	16,000 yd^3	none	16,000 yd^3
Areas of harbor features			
Area under breakwater	4.2 acres	3.7 acres	7 acres
Moorage basin area	4.8 acres	9.0 acres	5 acres
Access and entrance channel	3.6 acres	1.9 acres	4 acres
Staging area - usable surface	4.4 acres	2.3 acres	1 acre
Unusable areas (slopes)	9.0 acres	5.8 acres	4 acres
Total area covered by harbor features	26.0 acres	22.7 acres	21 acres
Proximity to users			
Distance from town	1.4 mi	1.4 mi	1 mi
Distance from airport	1,000 ft	1,000 ft	2,000 ft
Impact of harbor on the natural environment			
Turbidity created by dredge and fill activities during construction	yes	yes	yes
Birds may be dislocated during and after construction	yes	yes	yes
Fresh-water marsh wetland disruption	moderate, to be minimized	none	none

TABLE 5.--*Comparison of three alternatives*--Continued

	Plan 2A	Plan 2B	Site 3 plan (approximate)
Impact of harbor on the natural environment --Continued			
Marine intertidal/subtidal wetland			
Some disruption during construction	yes	yes	yes
Potential recolonization of adaptive species	yes	yes	yes
Some disruption during maintenance dredging	yes	no	yes
Impact of airport dredgings disposal	minor	minor	minor
Fish			
Short-term displacement during construction	yes	yes	yes
Less productivity due to dredging/ filling of habitat	yes	yes	yes
Potential use of rocky habitat created by breakwater	yes	yes	yes
Marine mammals			
Possible impact due to reduction in invertebrate prey species	yes	yes	yes
Threatened and endangered species	none	none	none
Human environment			
Number of homes adjacent to harbor	1	1	2
Possible interference with airport (distance from clear zone)	acceptable, at edge of zone	acceptable, at edge of zone	distant from zone
Project eliminates need for boats to seek shelter at runway end	yes	yes	yes
Harbor would allow local fishing fleet year-round storage, vessel accessibility	yes	yes	yes
Residents less dependent on private docks	yes	yes	yes
Regional economy would benefit	yes	yes	yes
Cultural resources			
Impact on small archeological site	none	none	none

earthquake will occur during the life of the project, the harbor design is consistent with other harbors in the same seismic zone.

4.2 Economic, Social, and Environmental Considerations

Long-range plans to extend the airport runway toward the site 2 harbor location have not progressed and are no longer being pursued. Two ponds and a small archeological site lie adjacent to site 2. However, construction at the site would avoid the ponds, and the archeological site has been cleared by archeologists.

A harbor at either site would eliminate the necessity for boats to seek shelter from storms near the end of the airport runway. There would be minor environmental impacts during construction, but no severe impacts of a permanent nature. A harbor would give local fishermen a place to store their vessels year-round and would benefit the economic climate of the region. Residents of Chignik would depend less on private, unprotected docks owned by the seafood processing companies; this would advance the community leaders' stated aim of becoming less dependent on the companies. The harbor would also allow the local residents to have vessels available at a protected site for more of the year, enabling them to participate in more of the fisheries and to expand their subsistence harvests.

4.3 Operation and Maintenance Considerations

4.3.1 Rubblemound Breakwater. Each of the structural plans considered would have similar operation and maintenance (O&M) costs for its rubblemound breakwater. Each breakwater is designed for the 50-year wave. Damage expected from a 70-year wave is considered acceptable at 5 to 10 percent loss of the armor rock.

4.3.2 Maintenance Dredging. Entrance channels designed for both site 2 and site 3 lie adjacent to stream outlets; the land configuration and the direction of the incident wave make avoidance of the streams desirable. Sand deposition is apparent at the mouths of these streams. Maintenance dredging of about 16,000 yd^3 would be expected approximately every 10 years at site 3 and with alternative 2A. Dredgings would be deposited at the airport disposal site.

Maintenance dredging is not anticipated for plan 2B at site 2. The prevailing drift pattern is to the south, as illustrated by the spit on the opposite side of the airstrip. However, little sediment transport from the north is anticipated, since the spit protects that area from waves, and the north breakwater would divert sediment to deep water. There is little wave activity from the south due to the short fetch. The channel will be surveyed periodically to monitor channel depths or possible sloughing of the channel sides.

4.4 Plan Selection

A brief comparison of the plans for sites 2 and 3 is given in table 5. Although site 3 remains the environmentally preferred location because it is farther from wetlands, mitigation measures to reduce the impact to the ponds near site 2 minimize environmental objections to that site. The site 2 design takes into account fish migration corridors, water quality, and marsh protection.

Alternative 2B is the National Economic Development (NED) plan, since it maximizes net benefit to the Nation.

5. DESCRIPTION OF SELECTED PLAN

5.1 Plan Components

Plan 2B (figure 6) is both the recommended plan and the NED plan. Its mooring basin measures 9.0 acres. The entrance and access channel area measures 1.9 acres. The harbor would provide year-round protected moorage for approximately 105 commercial vessels ranging in length from 30 ft to more than 120 ft.

5.1.1 Rubblemound Breakwaters. The recommended plan consists of an enclosed basin with a center entrance channel between two breakwaters. The north breakwater is 940 feet long and the south breakwater is 1,120 feet long, for a combined length of 2,060 feet. The breakwaters are designed for a breaking wave height of 6.0 ft. This is the wave condition expected from a storm with a 50-year recurrence interval.

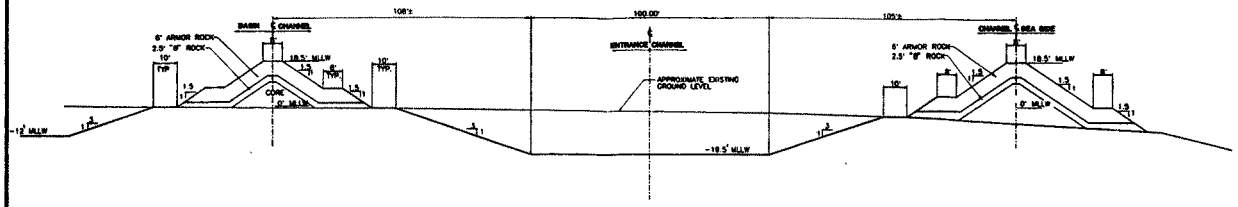
The breakwaters generally follow the -5 ft MLLW contour, although one breakwater head does extend to depths of 20 feet at MLLW. The crest elevation of the two breakwaters would be 18.5 ft MLLW. This was determined by evaluating runup on a 1.5H:1V slope using Mean Higher High Water (MHHW, which equals +8.9 ft MLLW) as the design water level. The structure is designed for moderate overtopping to accommodate water level increases up to 3 feet from surge occurring at the same time as MHHW. Based on a runup of approximately 11.5 feet, the design crest width is 8 feet, which should also accommodate construction activity on the crest.

The breakwater section (figure 8) is composed of a rock core with a cover of armor rock 6 ft thick; a secondary layer 2.5 ft thick; and a core consisting of rock spalls. Possible alternative cost-saving construction would use dredged materials for the core; the suitability of this material would be determined during the plans and specifications stage after drilling the harbor site. The use of concrete Core-Loc armor units rather than armor rock is a design alternative that will be offered in the plans and specifications.

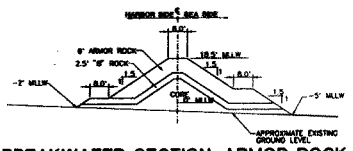
Most of the breakwater is sited in shallow water, with an 8-ft-wide bench around the breakwater between 0 and +4 ft MLLW. This bench is the natural toe of the breakwater, and is built of "B" stone. Typical breakwater sections are shown in figure 8. The design would require a total of 68,000 yd3 of rock, consisting of 22,400 yd3 of armor rock, 21,600 yd3 of secondary rock, and 24,000 yd3 of core (filter). The armor rock may be replaced by 7,400 concrete Core-Loc armor units weighing 3,000 pounds each. The breakwater covers about 3.7 acres.

5.1.2 Channels and Basins. The entrance channel is designed to accommodate two-way traffic for a design vessel 85 ft long, with a beam of 20 ft and a draft of 10 ft. Crabbers and tender vessels with loaded drafts of 12-14 ft would also use the harbor. The channel has a maximum width of 150 ft through the turn to allow a safety clearance for congestion, and tapers to a minimum width of 100 ft at each end. The side slopes are designed to prevent erosion and excessive shoaling in the entrance channel and undercutting of the breakwater. The area of the entrance channel is about 1.9 acres. Dredging of 65,600 yd3 in the entrance channel is required to obtain a depth of 19.5 ft at MLLW throughout.

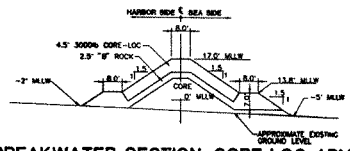
Table 6 shows and explains the dredged depths which would be provided in the harbor, and illustrates the impact of a reduction in channel depth on access for the larger vessels. A total of $670,200 (approximately 40 percent) of the project benefits are derived from operating and opportunity costs for tender vessels in the summer and crabbers in the winter, vessels which typically have a loaded draft of 12-14 feet. Assuming the same design parameters for vessel squat, safety clearance, and wave height, and a 13-ft loaded draft, these vessels would require entrance channel depths of 18.5 feet, without allowance for tides. A channel depth of 19.5 feet at MLLW would provide access 95 percent of the time for these vessels. Reducing the channel depth to 18.5 feet at MLLW would result in these larger vessels having access to the harbor 82 percent of the time. Modifying the channel bottom elevation from -19.5 ft MLLW to -18.5 ft MLLW would reduce initial costs by about $20,000 and annual costs by about $1,570. The reduction in annual benefits for the larger vessels (due to the change from 95-percent access to 82-percent access) would be about .13 ($672,000) = $87,400, greatly exceeding the reduction in annual costs. This analysis indicates that the entrance channel depth should remain 19.5 ft at MLLW.



Ⓐ BREAKWATER SECTION, ARMOR ROCK



Ⓑ BREAKWATER SECTION, ARMOR ROCK



TYPICAL BREAKWATER SECTION, CORE-LOC ARMOR UNITS

NTS

ALASKA DISTRICT CORPS OF ENGINEERS CIVIL WORKS BRANCH	TYPICAL BREAKWATER SECTIONS CHIGNIK SMALL BOAT HARBOR	8

Table 6.–*Harbor depths in feet below MLLW*

Allowance for:	Entrance channel		Access channel and deep portion of basin		Shallow portion of basin
	Seiners	Crabbers/ tenders	Seiners	Crabbers/ tenders	
Design draft	10.0	13.0	10.0	13.0	6.0
Design vessel squat	0.5	0.5	0.0	0.0	0.0
Safety clearance	3.0a	3.0a	2.0b	2.0b	2.0b
Allowance for wave ht.	2.0	2.0	0.5	0.5	0.0
SUBTOTAL	15.5	18.5	12.5	15.5	8.0
Channel depth	19.5	19.5	16.5	16.5	12.0
Tide allowance	4.0	1.0	4.0	1.0	4.0
Access frequency	100%	95%	100%	95%	100%
Channel depth (for comparison)	18.5	18.5			
Tide allowance	3.0	0.0			
Access frequency	99.5%	82%			

a In rock. b In sand.

The total area required for the mooring basin, 9.0 acres, was calculated using conventional transient and double-berth mooring for 74 vessels between 30 and 55 ft long, and single- and double-berth mooring for 31 vessels between 56 and 120 ft long. The breakwater would reduce the design wave of 6.0 ft to 1 ft or less within the basin. A typical mooring arrangement is shown in figure 6.

Dredging of 252,000 yd3 in the mooring basin is required to obtain a depth of 16.5 ft at MLLW for the vessels longer than 55 ft and 12 ft at MLLW for smaller vessels.

5.1.3 Staging Area and Disposal of Dredgings. The availability of year-round moorage in the harbor and the remote location of Chignik eliminate the need for a large staging area to accommodate parking space and expansion for other facilities. Because a launch ramp is not required, the need for an access and staging area for vehicles and trailers is also eliminated. A staging area of about 2.3 acres would offer a suitable area for harbor-related activity, including minimal parking and storage. The selected staging area plans are included in figure 6.

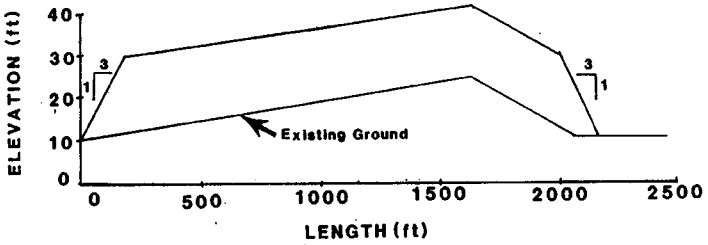
A total of approximately 35,800 yd^3 of dredged material from the mooring basin and the entrance and access channels would be disposed of adjacent to the north breakwater. The remaining 281,800 yd^3 of material would be disposed of on land, in an area northwest of the airport runway. Cross-sections of the disposal area fill are shown in figure 9. The location of the disposal area was shown in figure 4. (Site 2 in the figure is the recommended harbor site.) A slat fence 2,200 ft long and 4 ft high with 50 percent porosity would be constructed between the hill created by disposed dredgings and the runway. The fence would trap blowing sand to prevent possible damage to operating aircraft. An analysis based on the height of the hill and its distance from the runway concluded that no hill-caused turbulence problems would disturb aircraft on takeoff or landing.

The airport disposal area was selected because of its relatively low cost of disposal ($1.30/$yd^3$), its environmental acceptability, and its potential for reuse of the dredgings. In another alternative, dredgings could be barged 6 miles out to a deep ocean disposal site for $7.15/$yd^3$. Closer alternative sites were less environmentally acceptable. Alternative disposal sites were discussed in the EIS. The State and the city of Chignik have shown interest in using the disposed material from the selected site for future airport or road projects. The proximity of the airport site to the proposed harbor and the use of an efficient hydraulic dredging operation are responsible for the low disposal cost.

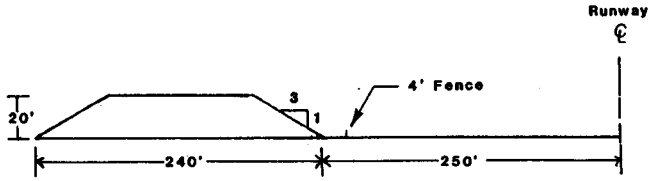
5.1.4 Pier or Dock. The city of Chignik is developing plans to construct a dock independently of the proposed harbor. There are no plans for fueling facilities within the harbor, since these facilities were recently reconstructed at the Chignik Pride pier and are present at the Aleutian Dragon Fisheries pier.

5.2 Plan Benefits

Benefits of the selected plan are presented in table 7. Details of benefit calculations are in section 4 of appendix B. Total benefits are $1,531,200 without NED employment benefits (benefit/cost ratio = 1.7) and $1,695,400 with NED employment benefits (benefit/cost ratio = 2.0).



PROFILE OF DEPOSIT ON AIRPORT PROPERTY



TYPICAL FILL CROSS SECTION

DISPOSAL SITE		
US Army Corps of Engineers Alaska District	CHIGNIK, ALASKA SMALL BOAT HARBOR	9

TABLE 7.--*Summary of benefits*

Item	Annual amount
Operating and opportunity costs prevented	$1,071,300
Overcrowding damage prevented	178,800
Dry storage costs prevented	31,300
Vessel delays prevented	25,000
Subsistence	192,800
Harbor of refuge	32,000
NED employment	164,200
Total annual NED benefits	**$1,695,400**

5.3 Plan Costs

Table 3 (in section 3) presents the detailed estimated costs of the selected plan based on 1995 prices. Table 8 presents the annual operation and maintenance costs.

TABLE 8.--*Annual NED costs of operation, maintenance, and replacement (OM&R), recommended plan (2B)*

		EQUIVALENT ANNUAL COSTS ($)			
Item	Interval	Corps	Other Fed.	Local	Total
Breakwater					
Replace 20% of armor	N/A	9,500			9,500
Hydrographic surveys	4 yrs; start yr 2	5,200			5,200
Disposal site					
Land rental	10 yrs			100	100
Sand removal	12x/yr			3,200	3,200
Fence replacement	5 yrs			1,200	1,200
Maintain navigation aids	5 yrs		600		600
Float system					
Maintain floats, stalls, & piles	1 yr			4,000	4,000
Replace floats, stalls, & piles	40 yrs			4,600	4,600
TOTAL OM&R COSTS		$14,700	$600	$13,100	$28,400

5.4 Risk and Uncertainty

As in any planning process, some of the assumptions made in this report are subject to error. Elements of risk and uncertainty could affect the harbor design, costs, and/or benefits. These elements are discussed in the pertinent portions of the report and appendixes. Table 9 provides a brief summary of the parameters most subject to uncertainty.

TABLE 9.--*Project parameters most subject to uncertainty*

Parameter	Assumption	Refer to section
Benefits	Based on expert opinion, interviews, and experience with other harbors. Subject to considerable interpretation. The operating costs and the number of vessels are the factors most subject to uncertainty.	Appendix B
Cost of quarried rock or Core-Loc armor units	Dependent on quarry location selected by contractor. Cost estimate assumes nearest operating quarry, then includes 20 percent contingency. Core-Loc would likely be constructed in Puget Sound area.	Main Report, 5.1.1
Design wave	50-year wave, based on *Climatic Atlas* and generally conservative design procedures. Substantiated by numerical modeling. Both rubblemound and core-loc structures would perform satisfactorily for a 70-year design wave.	Appendix A
Dredging costs	Borehole logs indicate easily dredgeable material. A new hydrographic survey would be used to verify quantities. Maintenance dredging is not anticipated, based on analysis of the wave climate.	Appendix C

Table 10 shows how much of an increase in certain costs or quantities, or how much of a decrease in benefits, could be tolerated for the project to maintain economic feasibility (benefit/cost ratio of 1.0 or greater). Each factor shown is adjusted to the limit of project feasibility, while all others are kept at the values assumed elsewhere in this report. This analysis supports the soundness of project feasibility.

TABLE 10.--*Sensitivity analysis of project economic feasibility using selected factors*

		Maximum change to retain 1.0 BCR		
Factor	**Original value**	**Value**	**Percent**	**New value**
Total annual benefits	$1,695,400	- $812,100	- 48%	$883,300
Total NED construction cost	$10,365,000	+$10,380,900	+100%	$20,745,900
Cost of armor rock	$74/yd^3	$463/yd^3	626%	$537/yd^3
Maintenance dredging	0	+$833,200/yr	—	$833,200/yr

5.5 Construction Considerations

Construction activities would be scheduled to avoid affecting use of the area by juvenile anadromous salmon. To avoid causing such impacts, in-water work is recommended to avoid spring migration (March 20 to May 15). No construction work would be conducted during the spring migration period. An adult salmon migration window (July 30 to September 10) is also recommended. A construction scenario to protect fish as much as possible but still take advantage of the summer construction season was discussed with the USFWS and the Alaska Department of Fish and Game. This scenario would be to start construction on May 16 on the southern breakwater, moving northward. Construction is expected to last 2 months per breakwater. The northern breakwater can be constructed during the restricted period. The shallow water conditions in the area would lessen fish disturbances because during low tides work can be conducted in the dry. After the breakwaters are constructed, the basin and entrance channel would be dredged.

A constructability analysis indicated that all of the material can be hauled during the period of May 15 through July 29. If construction is running smoothly, both breakwaters can be constructed during that time, and most or all of the dredging can

occur. If rough weather or other construction problems occur, the work should be far enough along that the remainder of work can be completed after September 10 but prior to winter. Dredging can continue during normally inclement weather because the area to be dredged will be protected by the newly constructed breakwaters.

Most of the dredged materials not used for the staging area would be piped to the airport disposal site and placed inside a berm. The upland disposal site is described more fully in the EIS. The berm would contain the water so that particulates could settle out, thereby minimizing water pollution.

5.6 Plan Accomplishments

The recommended plan would meet the planning objectives for Chignik in the following ways:

a. Providing year-round, convenient moorage for 105 commercial vessels, the anticipated demand for moorage in the near future;

b. Reducing vessel damage and losses resulting from storms and local dry-docking of vessels due to a lack of moorage space;

c. Reducing lost opportunity costs and improving the local economy and subsistence harvests by providing vessel availability on a year-round basis, including short-term vessel use during the rough season;

d. Preserving environmental resources to the maximum level consistent with maximizing NED net benefits and other objectives; and

e. Providing employment during harbor construction in the Chignik area, which has had persistent unemployment.

5.7 Plan Implementation

5.7.1 Construction.

Federal. The Corps of Engineers would be responsible for construction of the breakwater and entrance channel. The Coast Guard would be responsible for installing the navigation aids.

Local. The local sponsor would be responsible for providing all lands, easements, and rights-of-way (including suitable dredged material disposal sites) necessary for the project; for utility service to the harbor; for dredging of the inner harbor and construction of the floats; and for funding its share of the Federal major navigational items. Land interests necessary for the project are discussed in subsection 5.7.3. Cost sharing of the General Navigation Features is further explained in subsection 5.7.4.

5.7.2 Operation, Maintenance, and Replacement (OM&R). Activities would include the following:

Federal. The Corps of Engineers would maintain the breakwaters and channels. Navigational aids would be maintained by the Coast Guard. Maintenance dredging is not anticipated, although periodic hydrographic surveys would be conducted to monitor channel depths. If armor rock is used to construct the breakwaters, an estimated 20 percent of the armor rock would be replaced during the project's 50-year life. The dredgings would be disposed of at the airport disposal site. Alternatively, the dredgings could be used by the State for road or airport projects or by the city for fill. They could also be deposited in the ocean at sites discussed in the EIS. Table 8 indicates OM&R intervals and costs.

Local. The local sponsor would perform maintenance dredging of the interior boat basin, maintain the floats, utilities, etc., and operate the completed project. The local sponsor would also be responsible for providing a disposal site at the airport as required for dredged material during construction and periodic maintenance. The sponsor may use the dredged material for approved fill activities or other construction activities. The sponsor would periodically remove sand from behind the fence (2,200 ft long), which is designed to trap sand blowing toward the

runway. The sponsor would also replace the fence when necessary. The Federal Government must be held free from responsibility or cost in connection with the upland disposal site.

5.7.3 Real Property Interests. The project concept would require that the local sponsor provide all necessary real property rights. After execution of a Project Cooperation Agreement and completion of project specifications, information would be provided to the sponsor as to the areas and property interests required to enable acquisition of necessary rights in time to accommodate proposed construction schedules. Table 11 indicates the areas and interests that would be required.

TABLE 11.--*Land interests required for essential portions of project*

Feature/portion	Acres	Current owner	Interest	GNF*/Local
Breakwater	3.4	State tidal lands	Navigational servitude	GNF
Breakwater	.3	Private (uplands)	Permanent easement	GNF
Entrance and access channels	1.9	State tidal lands	Navigational servitude	GNF
Basin and float system above MHHW (including dredged slopes)	2.1	City/private	Permanent easement	Local
Basin and float system below MHHW (including dredged slopes)	9	State tidal lands	Permanent easement	Local
Permanent public access	0.2	City/State	Permanent easement	Local
Temporary construction	2.1	City/State/private	Temporary easement	GNF
Dredge disposal site	2.9	State	Temporary easement	GNF
(including fence)	11.1	State	Temporary easement	Local
Staging area	2.9	City	Temporary easement	GNF

* General Navigation Features (Federal parts of project).

Figure 10 depicts the real estate interests required for the Federal portions of the project (General Navigation Features), and figure 11 shows the interests required for the non-Federal portions.

Table 12 presents itemized real estate costs for both the Federal and the local portions of the project. Lands below the mean high water line would not have any real estate costs, since the U.S. Government has the rights to this land for the purpose of developing navigation projects.

TABLE 12.--*Real estate costs ($), Federal and non-Federal project portions*

Federal portions of project (GNF)				
Item	**Federal**	**Local[a]**	**Subtotal**	**Total**
Acquisitions (labor)	5,000	5,000	10,000	
Appraisals	2,500[b]	5,000	7,500	
Payments for real estate	2,500[b]	70,000	72,500	90,000
Non-Federal portions of project				
Item	**Federal**	**Local**		
Acquisitions (labor)		3,000	3,000	
Appraisals		2,000	2,000	
Payments for real estate		50,000	50,000	55,000
GRAND TOTAL, REAL ESTATE COSTS				145,000

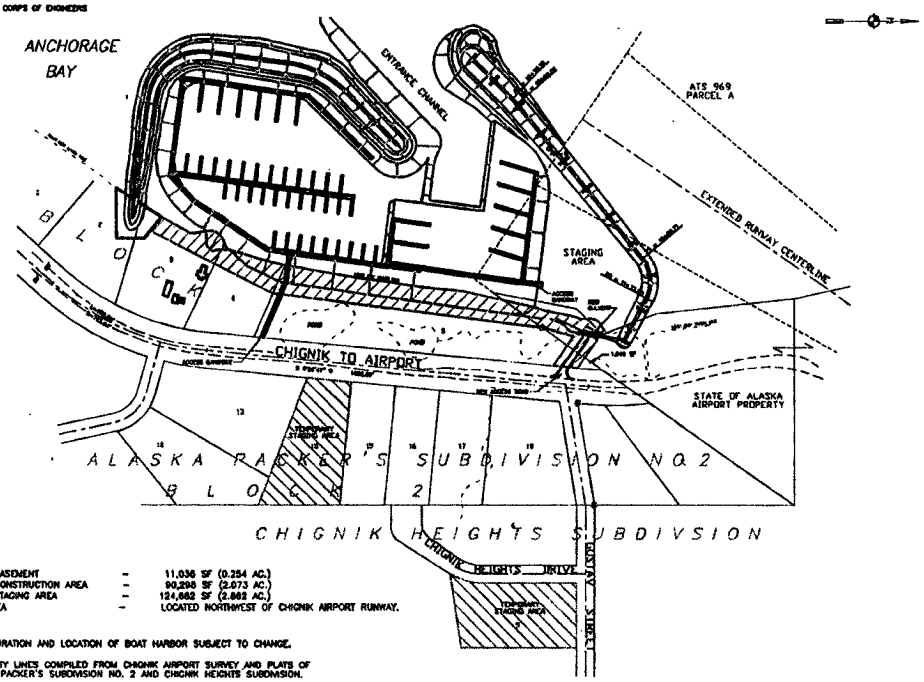
[a] For Federal project portions only, amounts paid by the local sponsor may be creditable toward reimbursement.
[b] For Government review of the local sponsor's activity.

5.7.4 Cost Apportionment. Construction costs for the project would be apportioned in accordance with Section 101 of the Water Resources Development Act of 1986.

The initial construction cost of the General Navigation Features is $5,614,000 (fully funded). The initial Federal investment is 90 percent of the construction cost for these features, or $5,053,000. The initial local share is 10 percent of the construction cost, or $561,000. The local sponsor (city of Chignik) must also contribute an

CHK-10

CORPS OF ENGINEERS



PERMANENT EASEMENT	-	11,036 SF (0.254 AC.)
TEMPORARY CONSTRUCTION AREA	-	90,295 SF (2.073 AC.)
TEMPORARY STAGING AREA	-	124,682 SF (2.862 AC.)
DISPOSAL AREA	-	LOCATED NORTHWEST OF CHIGNIK AIRPORT RUNWAY.

NOTE:
1. CONFIGURATION AND LOCATION OF BOAT HARBOR SUBJECT TO CHANGE.
2. PROPERTY LINES COMPILED FROM CHIGNIK AIRPORT SURVEY AND PLATS OF ALASKA PACKER'S SUBDIVISION NO. 2 AND CHIGNIK HEIGHTS SUBDIVISION.

N.T.S.

ALASKA DISTRICT
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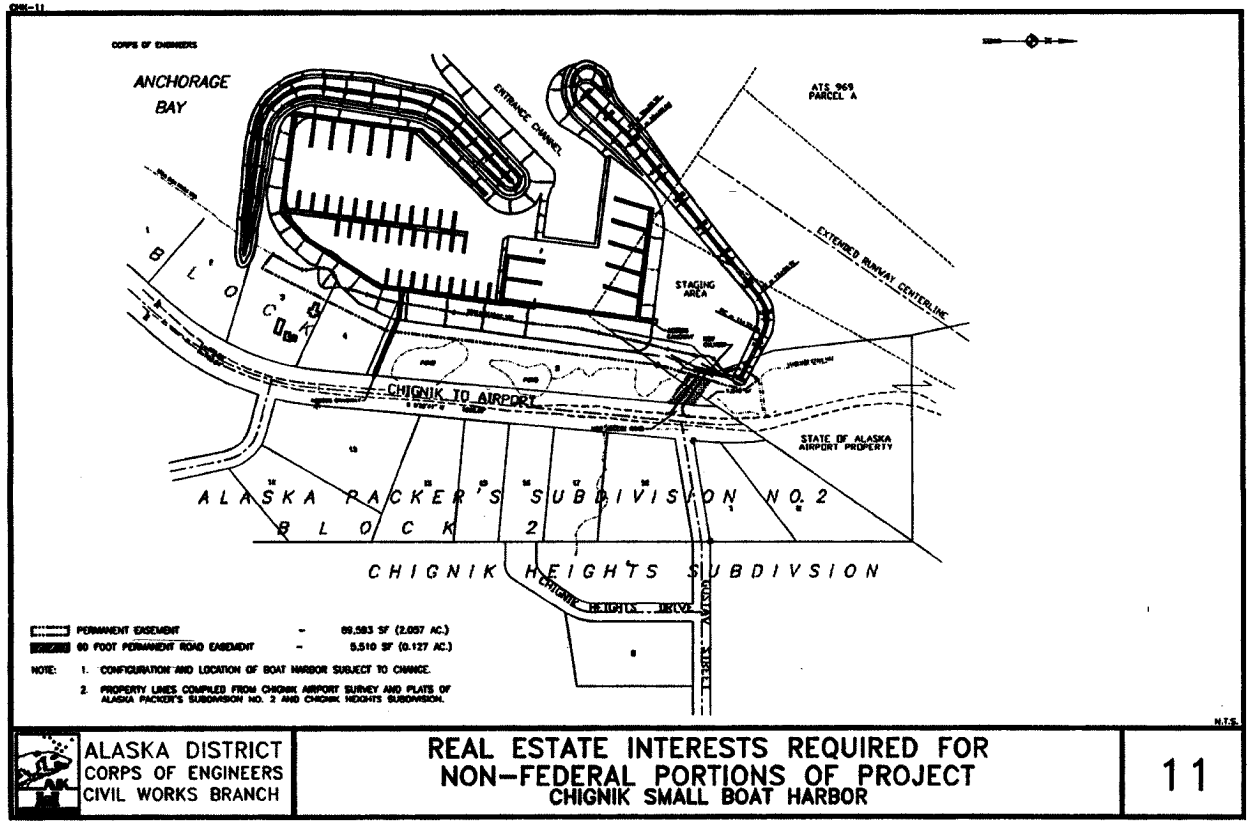
CIVIL WORKS BRANCH

REAL ESTATE INTERESTS REQUIRED FOR FEDERAL PORTIONS OF PROJECT
CHIGNIK SMALL BOAT HARBOR

10



ALASKA DISTRICT
CORPS OF ENGINEERS
CIVIL WORKS BRANCH

REAL ESTATE INTERESTS REQUIRED FOR NON-FEDERAL PORTIONS OF PROJECT
CHIGNIK SMALL BOAT HARBOR

11

additional 10 percent ($562,000), plus interest, over 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 lands, easements, rights-of-way, utility relocations, and dredge spoil disposal areas (LERRD) necessary for construction, operation, and maintenance of the general navigation features, an estimated $80,000. The sponsor is also responsible for 100 percent of the construction cost of the inner harbor facilities ($5,503,000), which includes dredging the inner harbor and construction of 105 slips. The fully funded cost apportionment for both the general navigation features and the inner harbor facilities is summarized in table 13.

TABLE 13.--*Apportionment of construction costs ($000)*

	Fully funded expenditures	
Item	**Federal**	**Non-Federal**
General Navigation Features		
Initial cost	5,053	561[a]
Final 10% payment	(562)	562[b]
TOTAL	4,491	1,123
Inner harbor facilities		5,503

[a] Initial local share of 10% cash payment of cost of general navigation features. Assumes July 1998 as midpoint construction date.
[b] Final 10% may be repaid to the Federal Government over a period not to exceed 30 years after completion of the project.

The Federal Government would assume 100 percent of the operation and maintenance costs for the Federal portions of the project. The local sponsor would assume all other operation and maintenance costs. The local sponsor would be responsible for providing LERRD for construction and future maintenance of the project.

In addition to the sponsor's share of costs for General Navigation Features, the sponsor is responsible for costs associated with other NED and non-NED features. These features are identified in the Detailed Cost Estimate (table 3) as having no Federal cost share. The Pertinent Data table, page ii, provides a summary of all shared costs.

5.7.5 Financial Analysis. The city, as the project's local sponsor, would depend on funding from the State of Alaska or State guarantee of municipal bonds, possibly combined with a grant from a non-Corps Federal agency such as the Economic Development Administration. The local share of construction costs exceeds $6 million. The city of Chignik would be dependent on assistance from the State.

Possible funding sources include the ADOT&PF; the Federal Economic Development Administration; Community Development Block Grants; and a grant from the State Department of Administration. A combination of these grants is proposed to make up the local share. The community strongly supports the harbor project and sees it as essential.

5.8 Public Involvement

At a series of public meetings between 1981 and 1986, residents of Chignik responded in favor of the construction of a small boat harbor for their community. On March 6, 1986, a public meeting took place at the City Hall in Chignik with approximately 10 persons in attendance. Representatives from the city government and the general public were present. The community supported the site 2 plan.

Since initiation of this feasibility study, the city administrator and mayor have worked closely with the project team, and local concerns have been addressed. Cooperation between the staffs of the Corps of Engineers and the ADOT&PF, together with input from the city of Chignik, resulted in the recommended plan.

5.9 Consultation Requirements

This study has been coordinated with all relevant Federal and State agencies. Information on this coordination is provided in the supplemental EIS and in correspondence. Specifically, table EIS-1 lists all applicable environmental laws and requirements. A list of report recipients and pertinent correspondence from all previous documents is presented as appendix D. The harbor plans will be in full compliance with each requirement when the final supplemental EIS is accepted.

Comments generated from public review on the draft and final EIS are summarized. The Environmental Protection Agency (EPA) wanted more detailed descriptions of the

site 3 alternative, which is the environmentally preferred alternative. EPA also believed the north access to the alternative staging area would further protect the marsh and ponds near site 2.

EPA was concerned with the testing and disposal of dredged material, especially the maintenance dredged material. The newly selected plan will not require maintenance dredging.

From the State of Alaska, the Department of Environmental Conservation wanted information on how the breakwater would affect water circulation and flushing in the harbor area. Numerical calculations of the flushing potential for the selected plan are included in this document. The department also had questions about the construction camp at the quarry site (the Alaska District quarry policy allows the construction contractor to select the quarry and submit for review a quarry development plan) and about fueling facilities (not planned as part of the harbor). The Department of Natural Resources noted that permits are necessary for construction on State-owned tideland, although Federal navigational servitude applies to Federal projects. All such permits are the responsibility of the city of Chignik.

Agencies concurring on the draft and final EIS with no major concerns included ADOT&PF, ADF&G, the Bristol Bay Coastal Resource Service Area, the National Marine Fisheries Service, and the National Oceanic and Atmospheric Administration.

Letters from the USFWS and from the National Marine Fisheries Service attested to the selected plan's compliance with the Threatened and Endangered Species Act. Although not deemed eligible for the National Register, a small archeological site adjacent to the project location was excavated and the data preserved. The disposal site for dredged material was also cleared for cultural resources.

The Federal Aviation Administration review of the draft supplemental EIS and Feasibility Report resulted in a change in the north breakwater alignment and the inner harbor configuration for the selected plan. The trunk of the breakwater was realigned and the inner harbor reconfigured so that boat masts would not penetrate the airport runway approach zone. The staging area was reduced to limit encroachment in the approach zone. The area in question would be fenced to prevent storage of

equipment and material there. No pole-mounted lighting would be installed in the staging area.

Scoping meetings were held with Federal and State agencies to identify issues on the revised alternative at site 2 for the supplemental EIS. The Fish and Wildlife Coordination Act Report was revised in response to the selected plan presented here.

5.10 Alaska Coastal Management Program Consistency Determination

The Chignik harbor project would be undertaken in a manner consistent to the maximum extent practicable with the Alaska Coastal Management Program (ACMP), as discussed in the EIS. The previous plan was found to be consistent.

5.11 Views of U.S. Fish and Wildlife Service (USFWS)

Under provisions of the Fish and Wildlife Coordination Act, the USFWS has identified potential project impacts to fish and wildlife and made recommendations for avoiding or mitigating these impacts. The EIS discusses these recommendations and the Corps' responses in design and implementation of the project. Table 14 summarizes the recommendations and responses pertinent to the selected plan.

TABLE 14.--*Summary of USFWS recommendations and Corps of Engineers (COE) responses*

FWS recommendation	COE response
Conduct hydraulic modeling to ensure that proper flushing and water quality can be maintained with the preferred design.	The Alaska District believes the harbor's numerical calculations indicate good flushing and water quality. Modeling would be ideal, and will be considered in the plans and specifications phase.
Avoid dredge material deposition and staging area construction in the wetlands and ponds landward of the boat harbor.	Agreed.
Prohibit dredging from March 30 to May 15 and July 29 to September 10 to prevent impacts to out-migrating juvenile salmon and migrating adult salmon.	Dredging should not occur from March 30 to May 15 and July 30 to September 10 to prevent adverse impacts to migrating salmon. The south breakwater should be built first during the open construction window (May 15 to July 29). Harbor construction should then proceed from south to north since completion of the harbor northward would have fewer impacts to salmon. If necessary, construction on the north end of the harbor could be accomplished during the fall migratory window (July 29 to September 10). This construction scenario was revised after submittal of the USFWS Coordination Report and is a draft recommendation.
Avoid impacts to or rerouting of the streams to the north and south of the boat basin during construction and future maintenance activities.	There will be no rerouting of the stream beds except in the tidal delta. The delta formation would be affected by the breakwater. The streams would rechannel through the tidal delta which would abut the breakwater. No maintenance activities would occur here.
If Castle Bay is chosen as the preferred quarry site, the contractor should be required to consult with State and Federal resource agencies to design a quarry development plan that minimizes adverse environmental impacts.	The contractor is required by our Letters of Agreement on Quarries to submit its quarry selection and development plan for State and Federal review. No quarry will be specified by the Alaska District.
Locate and mark bald eagle nests prior to project construction and consult with the Service regarding construction within 1 mile of any nest.	There are no bald eagle nesting trees within 1 mile of the harbor site.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The studies documented in this report indicate that Federal construction of a small boat harbor with a rubblemound breakwater at site 2B, as described in the selected plan, is technically possible, economically justified, and environmentally and socially acceptable. This plan was found to be the best for maximizing net benefits; thus it was designated the NED plan. The city of Chignik is willing to act as local sponsor for the project and fulfill all the necessary local cooperation requirements. The State of Alaska has indicated its willingness to pursue funding for the non-Federal costs of the project. Thus it is concluded that the recommended alternative should be pursued by the United States in cooperation with the city of Chignik and the State of Alaska.

6.2 Recommendations

I hereby recommend that the small boat harbor at Chignik, Alaska, be constructed as described in the recommended plan in this report at an estimated construction cost of $4,344,000 to the Federal Government, including $8,000 worth of navigation aids to be provided by the U.S. Coast Guard, and $15,300 annually for Federal maintenance, including $600 for maintaining navigation aids, provided that prior to construction the local sponsor agrees to:

a. Provide and maintain, at its own expense, the local service facilities, consisting of the mooring basin and the mooring facilities.

b. Provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction, operation, and maintenance of the general navigation features and the local service facilities.

c. Provide all improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the construction, operation, and maintenance of the general navigation features and the local service facilities. Such improvements may include, but are not necessarily limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and dewatering pumps and pipes.

d. 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:

- *10 percent of the costs attributable to dredging to a depth not in excess of 20 feet;*

- *25 percent of the costs attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet;*

- *50 percent of the costs attributable to dredging to a depth in excess of 45 feet.*

e. Repay with interest, over a period not to exceed 30 years following completion of the period of construction of the Project, an additional 0 to 10 percent of the total cost of construction of general navigation features depending upon the amount of credit given for the value of lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas provided by the Non-Federal Sponsor for the general navigation features. If the amount of credit exceeds 10% 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, right-of-way, relocations, and dredged or excavated material disposal areas, in excess of 10% of the total cost of construction of the general navigation features.

f. For so long as the Project remains authorized, operate and maintain the local service facilities and 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.

g. 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 and maintaining the general navigation features.

h. Hold and save the United States free from all damages arising from the construction, operation, and maintenance 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.

i. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Project, for a minimum of three 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 C.F.R. Section 33.20.

j. 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 USC 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, and maintenance of the general navigation features. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigations 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.

k. 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, or maintenance of the general navigation features.

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

m. 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 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, and maintenance, of the general navigation features, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

n. 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".

o. Provide a cash contribution equal to the following percentages of total historic preservation mitigation and data recovery costs attributable to commercial navigation that are in excess of one percent of the total amount authorized to be appropriated for commercial navigation:

- *10 percent of the costs attributable to dredging to a depth not in excess of 20 feet;*
- *25 percent of the costs attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet;*
- *50 percent of the costs attributable to dredging to a depth in excess of 45 feet.*

Date: 21 FEB96

PETER A. TOPP
Colonel, Corps of Engineers
District Engineer

[First Endorsement]

CENPD-ET-P (CENPA-EN-CW/Feb 96)
Mr. Wagner/kb/503-326-3830
SUBJECT: Chignik, Alaska, Small Boat Harbor, Interim Feasibility Report

CDR, North Pacific Division, Corps of Engineers, PO Box 2870, Portland, OR 97208-2870 22 FEB 1996

FOR CDR, USACE (CECW-ZA), 20 MASS AVE NW, WASH, DC 20314-1000

I concur in the conclusions and recommendations of the District Commander.

for Bartholomew B Bohn
RUSSELL L. FUHRMAN
Major General, USA
Commanding

COL, EN
Deputy Cdr

FSEIS APPENDIX 1: EVALUATION UNDER SECTION 404(b)(1), CLEAN WATER ACT

FSEIS APPENDIX 2: FISH AND WILDLIFE COORDINATION ACT REPORT

CHIGNIK SMALL BOAT HARBOR
CHIGNIK, ALASKA

The responsible lead agency is the U.S. Army Engineer District, Alaska.

ABSTRACT:

Chignik is a fishing community on the Pacific side of the Alaska Peninsula at the head of Anchorage Bay, approximately 250 air miles southwest of Kodiak Island. The community has no small boat harbor facilities. Four alternative harbor sites, all on the east side of Anchorage Bay, were initially identified by the Corps for study. Two of the alternatives, sites 2 and 3, were studied in detail. Site 2 is considered the best harbor site.

The Plan 2B design at site 2 is the preferred alternative. Refinements were made in the draft harbor design due to Federal Aviation Administration concerns. The harbor area is a shallow, sandy flat bordered by a small marsh. The harbor breakwaters would enclose a 9.0-acre mooring basin and a 2.3-acre tideland staging area. Moorage basin dredging and breakwater and staging area fill would affect 22.7 acres of tideland and seabed. Plan 2B was selected because it met identified public concerns and because of its net positive contributions to the goals of National Economic Development.

If you would like further information regarding this statement, please contact:

Mr. Guy R. McConnell
U.S. Army Engineer District, Alaska
ATTN: CENPA-EN-CW-ER
P.O. Box 898
Anchorage, Alaska 99506-0898

Commercial telephone:
(907) 753-2640.

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT CHIGNIK SMALL BOAT HARBOR CHIGNIK, ALASKA

SUMMARY

Major Findings and Conclusions

Alternative site 2 with plan B was chosen as the National Economic Development (NED) plan for construction of a harbor at Chignik because it had the maximum net benefits (difference between annual cost and annual benefits). The plan for alternative site 3 is more costly and conflicts with recent local plans for a new dock. Alternative site 3 had been identified by the U.S. Fish and Wildlife Service (USFWS) in previous documents as the environmentally preferred plan because of its siting away from a marsh and local clam beds. The USFWS favors the new alternative plan B because the design takes into account fish migration and water quality, and eliminates maintenance dredging. The marsh would be further protected by eliminating the marsh perimeter road alternative and constructing the north access road instead.

A 404(b)(1) evaluation under the Clean Water Act for the selected plan involved investigating impacts from dredging and filling. The areas that would be affected by project development include 22.7 acres of intertidal/ subtidal habitat. Although a staging area is not directly water-dependent, the proposed tideland for staging area was determined to be a necessary component of the harbor. No upland site was available; the marsh, a productive wetland, would be protected. The fill and dredge sites for the proposed harbor alternative can be specified through evaluation under Section 404(b)(1) of the Clean Water Act. The 404(b)(1) evaluation is in Final Supplemental Environmental Impact Statement (FSEIS) appendix 1.

No endangered species, archeological sites, or marine mammals would be affected by the project.

Coordination with the USFWS occurred throughout the project study. In 1995, the USFWS submitted a revised Draft Coordination Act Report, which is in FSEIS appendix 2. The most recent USFWS coordination letter is at the beginning of the appendix. The USFWS agreed that no changes to the draft report were necessary.

Public Involvement and Major Issues

Public and agency concerns were identified in scoping correspondences and public review of the draft and final Detailed Project Report (DPR) and Environmental Impact Statement (EIS), Small Boat Harbor, Chignik, Alaska, published in 1988.

The Environmental Protection Agency (EPA) had concerns about disturbances to the freshwater marsh at site 2 from the marsh perimeter road. EPA recommended selecting the north access route to the staging area. With the new selected plan, the north access route would be the vehicular access to the staging/harbor area. EPA also had concerns about harbor sediments becoming contaminated over time and the need for baseline sediment testing to compare with material from maintenance dredging. The EPA said the upland disposal site was not designed to confine contaminated sediments. The new selected plan B is not expected to require maintenance dredging. A revised 404 (b)(1) evaluation is in FSEIS appendix 1.

The USFWS recommended designing near-shore breaches in the breakwaters to benefit water quality and movement of juvenile salmon fry. Available research indicates that very small fry in the 35- to 40-millimeter range tend to concentrate in large numbers rather than move into deeper water around breakwaters or bulkheads. These shallow-water concentrations of fry are thought to be subject to predation. Riprap structures constructed at a 45-degree angle or less help reduce these impacts by providing habitat that more nearly resembles rocky shoreline areas. Breaches were designed into plan A at site 2. It was also thought that the breaches would benefit water circulation and flushing. The issues of protecting juvenile salmon and water quality remain the key issues challenging the harbor design. Plan B at site 2 does not have breaches but does incorporate a bench in the breakwater toe, which would provide a shallow-water path (between +5 and 0 feet Mean Lower Low Water) for fry into and out of the harbor. Water quality in the harbor would be maintained by good tidal exchange.

After the final DPR and EIS documents, a DSEIS was circulated for review in October 1989 to update the public on the procedure to obtain and evaluate the project's quarry site. The final supplemental EIS for the quarry issue was never completed. The subject of the quarry supplemental EIS was the Alaska District's proposed policy not to designate armor stone quarries for Corps projects. The EIS analyzed a typical existing quarry operation. Included was a comparative analysis of the generic quarry operation and the previously selected Castle Bay undeveloped quarry site. Remedial/mitigative measures were listed for noise, vibration and dust control, visual intrusions, and other concerns. Resources of concern were developed. Resources on the list were designated as indicators in a quarry area. If any of these indicators were present, additional environmental review could be required.

Issues concerning the Alaska District's quarry policy that were discussed in meetings, correspondence, and the quarry DSEIS review are summarized below.

The EPA commented that many significant impacts could occur as a result of quarry operation as well as quarry development. The Corps contended that the developmental effects had already occurred, were approved by local entities, and should be considered the existing condition. Mitigation measures for expansion of an existing quarry would be looked at on a case-by-case basis during the review of the

quarry development plan. Monitoring of the quarry operation by the Corps would be part of the project's overall quality assurance program.

A coordinated State of Alaska review under the Division of Governmental Coordination (DGC) expressed concern over the lack of alternative assessment of existing quarries pursuant to NEPA. The Corps position is that existing quarry sites are similar enough to be examined in a generic scenario. No specific quarry can be identified in a NEPA document, and to evaluate every quarry in Alaska is not reasonable (quarries need not be in Alaska to be selected).

The outcome of the quarry DSEIS effort prompted formal letters of agreement specifying review procedures as follows: The contractor selects either an existing quarry or an undeveloped quarry. The contractor submits a quarry development plan to the Corps for review by the USFWS and the State of Alaska Division of Governmental Coordination (DGC). This review procedure was agreed to by formal Letters of Agreement (appendix D). Selection of an existing quarry could either require a more exhaustive review resulting in mitigative stipulations, or no further review indicating no environmental problems. Selection of an undeveloped quarry site by the contractor would initiate the normal NEPA process.

The Federal Aviation Administration (FAA) review of the current DSEIS and Feasibility Report resulted in a change in the north breakwater alignment and inner harbor configuration. The north breakwater and staging area were within the FAA runway approach. No other significant review comments were submitted.

Relationships of Alternatives to Environmental Requirements

Table EIS-1 presents the relationships of the plans to environmental laws and other environmental requirements.

TABLE EIS-1.--*Relationship of alternatives to environmental requirements*

Federal Policy	Plan 2A	Plan 2B	Site 3
Archeological and Historical Preservation Act of 1974	Full compliance, all plans		
Clean Air Act	Full compliance, all plans		
Clean Water Act	Full compliance, all plans		
Coastal Zone Management Act of 1972	Full compliance, all plans		
Endangered Species Act of 1973	Full compliance, all plans		
Estuary Protection Act	Full compliance, all plans		
Federal Water Protection Recreation Act	Full compliance, all plans		
Fish and Wildlife Coordination Act	Full compliance, all plans		
National Environmental Policy Act	Full compliance, all plans		
Land and Water Conservation Fund Act	Full compliance, all plans		
Marine Protection Research and Sanctuaries Act of 1972	Full compliance, all plans		
National Historic Preservation Act of 1972	Full compliance, all plans		
River and Harbor Act of 1899	Full compliance, all plans		
Watershed Protection and Flood Prevention Act	Full compliance, all plans		
Wild and Scenic Rivers Act	Full compliance, all plans		
Executive Order 11593, Protection and Enhancement of the Cultural Environment	Full compliance, all plans		
Executive Order 11988, Flood Plain Management	Full compliance, all plans		
Executive Order 11990, Protection of Wetlands	Full compliance, all plans		
State and Local Policies			
State Water Quality Certification	Full compliance, all plans		
Alaska Coastal Management Program	Full compliance, all plans		

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1. NEED FOR AND OBJECTIVES OF ACTION

1.1 Study Authority and Public Concerns

In a letter to the Alaska District Corps of Engineers, dated March 30, 1981, the Chignik Village Council requested a study for navigation improvements for Chignik under Section 107 of the 1960 River and Harbor Act, as amended. A Reconnaissance Report, submitted in December 1981, and an Expanded Reconnaissance Report, submitted in September 1983, found that further study of navigation improvements for Chignik was warranted.

Feasibility-level studies were initiated in 1986, and a DPR and final EIS were completed in January 1988. Plans and Specifications were completed in 1991 as a Section 107 Continuing Authorities project. Final approval of the plans was not sought because the city of Chignik could not finance its share of the project cost. In 1993 the city of Chignik requested the Corps to pursue the project under the General Investigation Authority, which was expected to reduce the local cost share.

The General Investigation Feasibility Report (FR) was initiated in 1994. The 1987/88 DPR and EIS were used for the majority of the project's background information and are incorporated by reference.

The community's marine-oriented lifestyle and dependence on the commercial fishing industry are the main reasons for developing a protected harbor at Chignik. The Chignik area fishing district is one of the major salmon producing districts in the State. Currently, fishing vessels have no storm protection during the fishing season. In the off-season, fishermen must transport their vessels to distant harbors.

1.2 Planning Objectives

Planning objectives for the FR and supplemental EIS over and above the original study are to review the design criteria and to evaluate additional harbor designs and the environmental effects of those designs. Further planning criteria are listed in section 3 of the feasibility report.

2. ALTERNATIVES

2.1 Plans Eliminated From Further Study

Four sites in Anchorage Bay were considered for possible development (see figure 4, FR). Sites 2 and 3 were examined in the most detail because they offered the greatest potential. Sites 1 and 4 were eliminated, as discussed below.

2.1.1 Site 1. This site is located just inside a land spit on the northeast entrance to the bay. The spit would provide partial protection from waves, but a rubblemound breakwater also would be needed.

The Chignik airport is located near this site. Locating the harbor near the airport creates numerous safety hazards. According to the Federal Aviation Administration (FAA), for every 20 feet horizontally, 1 foot vertically must be left unobstructed from the end of a runway. Even if the harbor were designed to avoid being in the direct approach to the runway, the increased boat activity in that area might place obstructions such as masts or antennas in the airport clear zone and the approach area. Aircraft safety concerns and FAA regulations eliminated this site from further consideration.

2.1.2 Site 4. This site is at the south end of Anchorage Bay, just east of Aleutian Dragon Fisheries (formerly Sea Alaska). Cliffs rise close to the water at this site. The road, which runs from the town to the airstrip, is along the base of the cliffs. The cliffs are somewhat unstable, with rocks occasionally falling and blocking the road. Due to the cliffs and road, the staging area would have to be built on intertidal and subtidal land. This would push the breakwater into deeper water, thus increasing the size and cost of the project. Therefore, this site was eliminated from further consideration.

2.2 No Action

This alternative is the least environmentally damaging, as no change to the existing physical/biological conditions would occur. However, human needs, as part of the environmental whole, must be considered in the evaluation process. The need for the proposed facilities has been identified and will escalate as the fishing industry grows. Boat repair, replacement, and transport are increasing in cost, which could be kept to a minimum if access to boat repair facilities in a protected harbor were developed. For these reasons, the no-development alternative is not a viable response to the local need.

2.3 Plans Considered in Detail

Two alternative sites were evaluated: site 2, near the base of the spit, and site 3, which is 200 feet northeast of the Chignik Pride dock. Sites 2 and 3 are approximately 1,000 feet apart. Detailed designs and varying layouts were investigated for both sites. However, site 2 was selected as the best harbor location in the 1987 DPR. The harbor design presented in the 1987/88 report is again discussed here, and called plan 2A. An additional design for this site (plan 2B) is included for study. Plan 2B is the preferred plan.

2.3.1 Site 2.

Plan 2A. This plan was the selected plan in the 1987/88 DPR and final EIS. The plan view is shown in figure 5 in the feasibility report (FR). Additional discussion on the plan is on pages 28-30 in the FR.

The harbor would provide year-round protection for vessels from 30 feet to more than 120 feet long. Because the Chignik area is accessible only by air or sea, there is no requirement for boat launching facilities. A small staging area would be needed for equipment storage, minimal parking, and gangway access. The breakwater and inner harbor facilities would be designed for a 50-year storm event. Maintenance dredging would be necessary every 10 years over the life of the project.

Breakwater. The rubblemound breakwater was developed for a non-breaking wave height of 8.5 feet; however, this has been revised down to 6 feet. One structure would be required to protect the inner harbor. The length of the breakwater would be 1,460 feet. The side slope of 1 vertical (V) to 1.5 horizontal (H) would be stable. The design crest elevation due to design wave updates would be 18.5 feet (ft) Mean Lower Low Water (MLLW), down from 20.5 ft MLLW.

Moorage Basin. The mooring area would be 4.8 acres. This is the space required using conventional double-berth mooring for 55 vessels from 31 to 60 feet long, and single- and double-berth mooring for 15 larger vessels from 61 feet to 120 feet long or longer. Basin depths would range from -12 to -17.5 ft MLLW.

The length-to-width (L/W) ratio of the basin is 2.3. The basin width is restricted due to rapidly increasing depths in Anchorage Bay; therefore, the L/W ratio is not adjustable by increasing the width of the harbor plan. Circulation would be optimized by several design characteristics. The entrance is aligned so that the inflow direction is parallel to the long axis of the basin to provide improved circulation characteristics. A breach between the breakwater and shore was designed to provide adequate water depth for fish migration, and the toe of the staging area fill is limited to elevations greater than 0.0 feet MLLW. The breach also would allow a significant opening to provide for increased water exchange through the basin.

Entrance Channel. The entrance channel would be cut through the near-shore zone and would be subject to the erosive effects of wave conditions. The severity of erosion would depend on the tide and wave climate. The entrance channel side slopes would need protection to prevent erosion, excessive shoaling in the entrance channel, and undercutting of the breakwater. The design is as follows:

Armor the entrance channel adjacent to the breakwater. This slope would be cut at 1V:3H. The other entrance channel side slope would be cut at 1V:4H.

The entrance channel is designed to allow two-way traffic for the 85-foot design vessel. The vessels require an entrance channel depth of -20 ft MLLW. To maintain project depth, 16,000 cubic yards (yd^3) of dredging would be required every 10 years.

Access Channel. The access channel would provide vessel access to the mooring basin and maneuvering area at the extreme low water level (-4 feet MLLW). The access channel design depth is -16.5 feet MLLW. The access channel provides for the draft of the design vessel, safety clearance, and allowances for boat wake in the basin.

Staging Area and Harbor Facilities. Chignik harbor would be used by fishing vessels operating in the Chignik area. Chignik's remote location negates the need for a large staging area, which normally provides parking space and expansion for other facilities. No launch ramp is required, eliminating the need for an access and staging area for vehicles and trailers. The staging area of 4.1 acres is for limited parking, gangway access, and storage. Staging area is considered to be the minimum necessary to provide adequate access to the harbor gangways and floats. The staging area in this location also would provide the harbor a certain amount of wave protection.

The staging area would extend onto the tidal lands on the north side of the basin. It also would continue on the basin side of the ponds and then connect to the airport and town road on the south side of the ponds for vehicle access. The width would vary from approximately 300 feet on the tidal lands to 25 feet between the ponds and basin. Additional parking and access were anticipated from the marsh perimeter road. The elevation primarily would be +15 feet MLLW, although it would slope up to +20 feet MLLW by the road.

An alternative vehicle access corridor would lie across a creek on the north side of the ponds. This road access alternative is the selected route for Plan 2B's harbor/staging area.

A conceptual design of the inner harbor facilities would include two gangways, eight dolphins, and an extensive float system. These features would require approximately 100 pilings.

Dredged Material Disposal. There would be approximately 264,000 yd^3 of excess dredged material. There are two alternative dredged material disposal sites, one deep-water and one upland.

The selected disposal site is upland in the area northeast of the airport runway shown in figure EIS-3. There are two alternative ways of disposing of the dredged material at this site: vehicle transport and hydraulic piping. Vehicle transport would be much more time-consuming, but the dredged material would be less water-laden than the

slurry resulting from the hydraulic pipe technique. The hydraulic method would require a near-shore pipeline and a confined disposal facility.

An appropriately constructed containment dike would be required to allow the dredged material to settle and to allow water to drain from it. Specifications also are necessary to ensure that sediment-laden drainage water does not enter wetlands or the bay.

A confined disposal facility would consist of an earthen berm sufficiently high to allow ponding for settlement of suspended solids. The creation of divided compartments within the dike would facilitate sedimentation by filling one compartment at a time. The clarified water would be discharged from the containment dike over a weir. This effluent can be characterized by its suspended solids concentration and flow rate. The receiving water would be Anchorage Bay.

To design the site-specific containment dike, three factors must be considered: volume of material, type of material, and settlement rates to ensure adequate retention. The detailed design is to be submitted by the construction contractor, if this disposal method is selected.

Plan 2B. This is the preferred plan. The design has been modified slightly in the final report to shift the north breakwater away from the FAA clear zone for the airport. The revised plan view is shown in figure 6 in the main report. The trunk of the north breakwater was realigned and the inner harbor reconfigured so that boat masts would not penetrate the runway approach zone. The staging area was reduced so that there would be limited encroachment in the approach zone. The area in question would be fenced to prevent storage of equipment and material there. No pole-mounted area lighting is to be installed in the staging area. These design changes would also reduce rock and staging area fill quantities. No maintenance dredging would be required.

Breakwater. The breakwater configuration is the significant change in this design compared with plan 2A. Two breakwaters with a combined length of 2,060 feet would curve out to a single entrance channel and would protect the entrance channel and moorage basin. The south breakwater would connect to shore just inside the small stream. The north breakwater would end a short distance from shore to allow an outlet to another small stream.

Moorage Basin. The moorage area would be 9.0 acres, providing space for more vessels and future expansion than plan 2A. Depths would range from -12 to -16.5 feet MLLW.

Entrance Channel. In plan 2B, the entrance channel side slopes would not need stabilization because the breakwaters would provide protection from the erosive effects of waves. The side slopes would be cut at 1V:3H.

Staging Area and Harbor Facilities. A small staging area similar to plan 2A's would be constructed from dredged material. The staging area is further reduced in the final design. Access to the harbor from the main road would be by improving paths on either side of the wetland complex. The south access would be a boardwalk-type footpath connecting to a harbor gangway. The city of Chignik owns property across the main road where parking would be available. The north access road requires crossing a small stream, which would require a culvert. The single-lane road (16 feet wide) would access the staging area. The culvert would be an arch design compatible with Alaska Department of Fish and Game specifications. The road is shown on the plan drawing, figure 6 in the main report.

Because the harbor would be enclosed, the breakwater in water deeper than -5 ft MLLW would include an 8-foot-wide bench at the toe, providing a shallow-water corridor to benefit juvenile salmon migration. A cross section of the bench is shown in figure 8 in the FR. Plan 2B optimizes space to accommodate a greater number of vessels (105 total), and eliminates maintenance dredging. A comparison of harbor features of plans 2A and 2B is presented in table EIS-2.

Dredged Material Disposal. There would be 281,800 yd^3 of excess dredged material for plan 2B. The same preferred disposal option and consideration would apply for this plan.

2.3.2 Site 3. This site is north of the pier and stream mouth at the Chignik Pride dock and south of the stream mouth, which marks the southern boundary of site 2. The site was initially chosen because local interests preferred its location near existing facilities. Several harbor layout designs, none of which proved economically feasible, were analyzed for site 3. One is presented in figure 7 in the FR. Recent calculations indicate that this site is more exposed to severe wave and wind conditions. Site 2 receives more protection from the spit. In addition, the city of Chignik proposes to construct a municipal dock in this location to accommodate fishing vessels.

Two factors contribute to the high breakwater quantity requirements. First, the ocean bottom drops to more than -40 ft MLLW fairly near shore, leaving only a thin band of area between the shore and the breakwater. This would make the basin relatively long and narrow, requiring a long breakwater. Second, a submarine trench lies perpendicular to shore near the middle of the shoreline at the site, leaving inadequate area for basin development either north or south of the trench.

The harbor layout developed for site 3 would provide year-round protection for 70 vessels from 30 feet to more than 120 feet long. Like plan 2A, this plan would feature a rectangular basin and access channel totaling 6.5 acres. Vessels longer than 60 feet would have the diagonal stalls used in Alaskan harbors for large vessels. Small vessels would be in stalls perpendicular to the finger floats. The harbor would be dredged to -12 ft MLLW for the shallow portion of the basin up to -22 ft MLLW

TABLE EIS-2.--*Site 2 project feature comparisons, plans 2A and 2B*

Feature	Plan 2A	Plan 2B
Vessels accommodated	70	105
Total affected area	29.5 acres	22.7 acres
Breakwater		
Area covered	4.4 acres	3.7 acres
Armor rock	20,000 cubic yards	22,400 cubic yards
Secondary rock	19,000 cubic yards	21,600 cubic yards
Core material	21,000 cubic yards	24,000 cubic yards
Core-Loc (option)	6,300 units	7,400 units
Moorage basin		
Area covered	4.8 acres	9.0 acres
Dredging	175,000 cubic yards	252,000 cubic yards
Depths	-12 ft to -16.5 ft MLLW	-12 ft to -16.5 ft MLLW
Maintenance dredging	16,000 cubic yards, 10-year cycle	None
Entrance channel		
Area covered	6.0 acres	3.4 acres
Dredging	136,000 cubic yards	65,600 cubic yards
Secondary rock	8,000 cubic yards	None
Depth	-19.5 ft MLLW	-19.5 ft MLLW
Access channel		
Area covered	2.9 acres	None
Dredging	48,600 cubic yards	
Depth	-16.5 ft MLLW	
Total dredging volume	360,000 cubic yards	317,600 cubic yards
Staging area		
Area covered	4.4 acres	2.3 acres
Fill quantity	96,000 cubic yards	35,800 cubic yards
Secondary rock	7,700 cubic yards	2,150 cubic yards
Roads	1,035 linear feet along marsh area, included in staging area total	200-linear-foot access road with a 30-foot culvert on stream

for the deepest portion of the channel. The deepest portion was designed for the deeper-draft vessels, the lowest expected tide, and safety factors. A staging area for parking, storage, and gangway access could be located between the shoreline and the

basin boundary. A small additional staging area could be provided on the side of the basin. The plan would require initial dredging of approximately 212,000 yd^3 of mostly sandy material, including an estimated 1 percent dredged shale bedrock. All but 3,000 yd^3 of this material would be disposed of in a 240-foot-wide mound, nearly 20 feet high and 2,000 feet long, between the airport northwest boundary and a line 250 feet from the runway center line. The breakwater would consist of 53,000 yd^3 of armor rock between 4,000 and 6,700 pounds, 48,000 yd^3 of secondary rock between 350 and 4,000 pounds, and 60,000 yd^3 of core material up to 350 pounds. To maintain project depth, dredging of 16,000 yd^3 would be required every 10 years.

2.4 Comparative Impacts of Alternatives

Table EIS-3 compares the environmental impacts of harbor plans at site 2 (plans 2A and 2B) and site 3. A fuller explanation of the alternative plan effects is in Section 4, Environmental Consequences.

TABLE EIS-3.--*Comparative impacts of alternatives*

Significant resources	Site 2, plan 2A	Site 2, plan 2B	Site 3
Freshwater marsh	Indirect wildlife effects from perimeter road.	Access road on border of wetlands, culvert on stream.	No effects
Intertidal/subtidal	29.5 acres of habitat lost/altered from dredging, filling for harbor. Maintenance every 10 years.	22.7 acres of habitat lost/altered from dredging and filling.	21 acres of habitat lost/altered from dredging and filling. More diverse intertidal species affected. Maintenance dredging every 10 years.
Water quality	Turbidity effects from construction and maintenance activity. Tidal exchange/near-shore breach would flush harbor-generated pollutants. Entrance aligned with long axis of basin.	Turbidity effects from construction activity. Tidal exchange would flush harbor-generated pollutants. Basins with rounded corners, single entrance channels create good circulation gyres.	Same effects as site 2, plan 2A.

TABLE EIS-3.--*Comparative impacts of alternatives*--Continued

Significant resources	Site 2, plan 2A	Site 2, plan 2B	Site 3
Fish	Short-term displacement of fish species during construction. Near-shore feeding, rearing habitat replaced with harbor. Breach assists migration into harbor.	Short-term displacement of fish species during construction. Near-shore feeding, rearing habitat replaced with harbor. Breakwater bench assists migration into harbor.	Same effects as site 2, plan 2A.
Birds	Passerines, waterfowl, shore birds and sea birds may be dislocated because of construction activities and harbor operation. The marsh perimeter road encroaches into the marsh/bird habitat.	Same effects to shore birds and sea birds as plan 2A. However, the north access road would lessen the effects to the marsh habitat.	Harbor construction and operation is distant from the marsh but would affect shore birds and sea birds in the proposed harbor area.
Marine mammals	Reduction in invertebrate prey species caused by dredge and fill activity.	Reduction in invertebrate prey species caused by dredge and fill activity.	Reduction in invertebrate prey species caused by dredge and fill activity.
Dredged material disposal sites	Upland disposal favored over deep-water disposal. Upland disposal containment site would allow for settlement and effluent control if necessary.	Same effects as plan 2A.	Same effects as site 2 plans.
Threatened and endangered species	No impact.	No impact.	No impact.
Quarry site	Quarry site selection would be made by project contractor. Agency review of quarry development plan if existing quarry chosen. New quarry would require further NEPA review.	Same as plan 2A.	Same as site 2, plan 2A.
Social/cultural	Harbor provides year-round moorage for fishing fleet (accommodates 70 vessels). Less dependence on cannery docks. Benefits economics of region.	Harbor provides year-round moorage for fishing fleet (accommodates 105 vessels). Less dependence on cannery docks. Benefits economics of region.	Same as site 2, plan 2A.

3. AFFECTED ENVIRONMENT

3.1 Environmental Conditions

Background environmental conditions were described in the "Final Environmental Impact Statement and Detailed Project Report, Chignik, Alaska," dated January 1988, and are incorporated here by reference. This FSEIS addresses new issues and updates and summarizes the project alternatives as necessary for an understanding of the new project features in the context of the overall project.

The village of Chignik is at the head of Anchorage Bay within Chignik Bay on the south side of the Alaska Peninsula. Within the Chignik area, the lowlands are extremely narrow and limited, with mountains rising directly from the ocean in many places.

Tides in the area range from a mean higher high water (MHHW) level of approximately +8.9 feet to an extreme low of -4 feet. Mean tide level is 4.8 feet. High water levels from offshore storms occur each year.

Vegetation along the ridgetops is relatively barren because of the harsh environment of broken rock and steep topography. At lower elevations, the vegetation is predominantly alder-willow scrub with a dense understory of bluejoint grass and a mixture of herbs. Beach fringe and wetland meadow vegetation grows along the shoreline and in the lowlands.

Bears are common throughout this region and are often seen in and about Chignik. Smaller mammals occur throughout the alder and willow thickets, especially where the more open areas have extensive stands of grasses and herbs for food. Furbearers such as red foxes, weasels, mink, wolverine, and beaver have been noted in the general area. Many species of birds are seasonally abundant in the Chignik area.

Marine biological resources are productive and diverse. Commercial fishing is the main industry for Chignik-area residents. The fishery is concentrated on salmon; shellfish and halibut are of lesser importance. Shellfish stocks are in decline. Those species, other fish species, butter clams, and other marine life also are harvested by subsistence fishermen. Marine mammals abundant in the region include sea otters, Steller sea lions, and whales.

3.2 Significant Resources

Resources identified as significant by national or State of Alaska policy and local government or public interests are addressed in this section if they might be affected by any of the project alternatives.

3.2.1 Freshwater Marsh. A freshwater/brackish wetland is adjacent to harbor site 2. The wetland is fed by creeks draining from the steep coastal bluffs. The highest flood tide mixes saline water with fresh waters of the creek. A small series of sand dunes, vegetated primarily by beach rye grass, border the beach. Along the periphery of several shallow ponds and creek banks are sedges, rushes, dwarf willow, and other types of salt marsh vegetation. Salt marshes contain many plant species of high value to wildlife. Marshes also are a major source of detritus important to the aquatic ecosystem, especially detritivorous invertebrates, which are prey for fish species.

Corps of Engineers and U.S. Fish and Wildlife Service biologists conducted a preliminary inventory of resources in the area in the spring of 1984. Minnow traps and a fyke net were set over a period of several days in the ponds and the streams to sample fish species. The only fish trapped were Dolly Varden. The unnamed streams feeding the wetland support small populations of pink salmon (State Anadromous Fish Streams No. 271-10-10126 and 271-10-10124). Waterfowl were observed resting and feeding and may use the area for nesting. Perching birds were observed throughout the area and probably nest in the area also.

3.2.2 Marine Intertidal/Subtidal Resources. The two project sites are adjacent to each other along the east windswept shoreline of Anchorage Bay. The northeast shore is partially protected where currents have deposited sand, forming a spit. Sand deposition extends from the spit approximately 800 yards along the shoreline. Some sand dune formation is occurring. The remainder of the shoreline is a rocky shingle beach.

Following are summarized descriptions of the intertidal and subtidal resources of the harbor sites:

Site 2. The upper intertidal zone is largely devoid of flora and fauna. Somewhat lower, below the sharp break in the slope of the beach, low densities of polychaetes occur. They become more abundant toward the lower intertidal zone. Several species of clams occur in the mid- to lower tidal zones. Cockles, Pacific littleneck, and butter clams are gathered as subsistence food items along the beach. Barnacles and blue mussels live on widely scattered boulders in the mid-intertidal zone; the lack of rocky substrates limits their abundance at this site.

Toward the mean lower low water line, patches of eelgrass and several species of marine algae form moderately dense stands. Hermit crabs, juvenile Dungeness crabs, sea anemones, and starfish were noted in the lower intertidal zone.

Site 3. The boulder and cobble substrate of the upper intertidal zone is inhabited by periwinkles, limpets, blue mussels, and barnacles. Marine algae form a very prominent band at the mid- to lower tidal zones. Eelgrass beds are interspersed with the algae in sandy spots. Polychaete holes were first noted in the vicinity of

these algae, and quadrant samples indicated that these were occupied by *Nereis*, *Nephtys*, *Glycera*, *Owenia*, and cone worms, *Pectinaria*. They extended to the water's edge. The benthic communities within the mid- and lower intertidal zones include polychaetes, chitons, channeled dogwinkles, periwinkles, and clams. Hermit crabs, juvenile dungeness crabs, and crescent gunnels live among the rocks.

Biota in the intertidal area show patterns of zonation that correspond to substrate and elevation. The upper intertidal zone of harbor site 3 has a boulder/cobble substrate that supports more diverse biological assemblages than the sand/gravel substrate of harbor site 2. However, the sand/gravel substrate supports the dense clam populations, which are more easily accessible for local subsistence gathering. The lower intertidal and subtidal areas of both harbor sites have predominantly sand bottoms and support what appear to be similar biological communities.

3.2.3 Water Quality. No water quality data exist for the marine waters in the Chignik area. Visual observations during field visits suggest the waters are pristine and clear. The vigorous exchange of water within the bay with larger bodies of water and the remoteness of the area contribute to this pristine quality.

3.2.4 Fish. Salmon is the dominant commercial species taken in the Chignik area. Virtually all of the Chignik Bay District catch is generated by the highly productive Chignik River system. The Chignik Bay District is confined to those waters southwest of a line extending from Jack Point on the south to Neketa Creek on the north, including Anchorage Bay. This district accounts for a large percentage of the entire Chignik Fishery Management Area. Species include sockeye, coho, pink, chum, and king salmon. Dolly Varden char are also common in area streams.

Three streams flowing into Anchorage Bay support salmon populations. Indian Creek, near the village of Chignik, has a small population of pink salmon. Habitat alteration has occurred, however, so no population estimates are available. The other two creeks on either side of the proposed harbor are noted in the Alaska Department of Fish and Game (ADF&G) *Alaska Habitat Management Guide*, 1985, as having small populations of pink salmon. Dolly Varden were observed in these creeks and in the ponds. Recent observations indicate adult pink salmon returns in both creeks during 1995. The southern stream had the majority of salmon. Juvenile salmon were observed schooling near shore.

Surveys show that Chignik Bay has high relative densities of several species of commercially important groundfish, such as walleye pollock, Pacific cod, sablefish, and arrowtooth flounder. Local fishermen currently fish for halibut.

Nursery areas for many demersal fish are located in the estuaries, bays, and near-shore waters of the region. With growth and development, the juveniles of many of the important commercial fish species move to progressively deeper areas of the continental shelf until finally merging with the adult populations.

Three species of commercially important shellfish inhabit the waters near the project study area: red king, tanner, and dungeness crab. King crab inhabit bottom depths of the continental shelf and may be found at water depths of 400 meters. They prefer mud or sand substrates. During field studies, a few crabs were netted. However, the project site is too shallow to have substantial habitat value.

3.2.5 Birds. Many species of birds are seasonally abundant in the Chignik area. Most passerines (perching birds) prefer alder and willow stands and are encountered along streams and wetlands. Bald eagles are common along the coastline. Local residents report that no nesting occurs along the cliffs closest to the harbor project.

Chignik is on the edge of a major north-south migration route for waterfowl, shorebirds, and marine birds that follow the Alaska Peninsula and colonize major rookeries near Chignik.

3.2.6 Marine Mammals. Several species of great whales may occur in the northern Gulf of Alaska. It is unlikely that any of these species would be found in the immediate project area. Great whale species that may be found in the northern Gulf of Alaska are the blue, black right, fin, Sei, gray, and humpback. All these species are on the endangered species list. Beluga whale, killer whale, harbor porpoise, and Dall porpoise may also range throughout the region.

Steller sea lions are present in Chignik Bay. They concentrate and haul out on rocky islands. No haul-out areas are in the project area. Sea otters also range throughout the area. Sea otters are believed to be an influential component in the ecology of the Chignik near-shore zone.

3.3 Dredged Material Disposal Sites

Project alternatives (site 2, plans 2A and 2B, and site 3) would have varying quantities of excess dredged material. Some of this material could be used for fill in creating an intertidal staging area. The composition of the dredged material would be a combination of silty sand and gravels.

To evaluate and select an in-water disposal site, several depths were investigated: the shallowest depths in and around the project site, discussed in previous sections; an intermediate depth of 19-20 fathoms in Anchorage Bay; and a deep hole of 40 to 50 fathoms in Chignik Bay. The upland site proposal offered an alternative to disposal in water, proximity to the dredging project, and a place to stockpile fill for local use.

3.3.1 Alternative 1 - Deep-Water Disposal (at 40 to 50 fathoms). Investigations of deep-water areas in Chignik Bay were conducted in June 1985 by CE, FWS, and ADF&G biologists using underwater video equipment and a Van Veer grab sampler. Surveys were along transects cross-cutting designated areas delineated

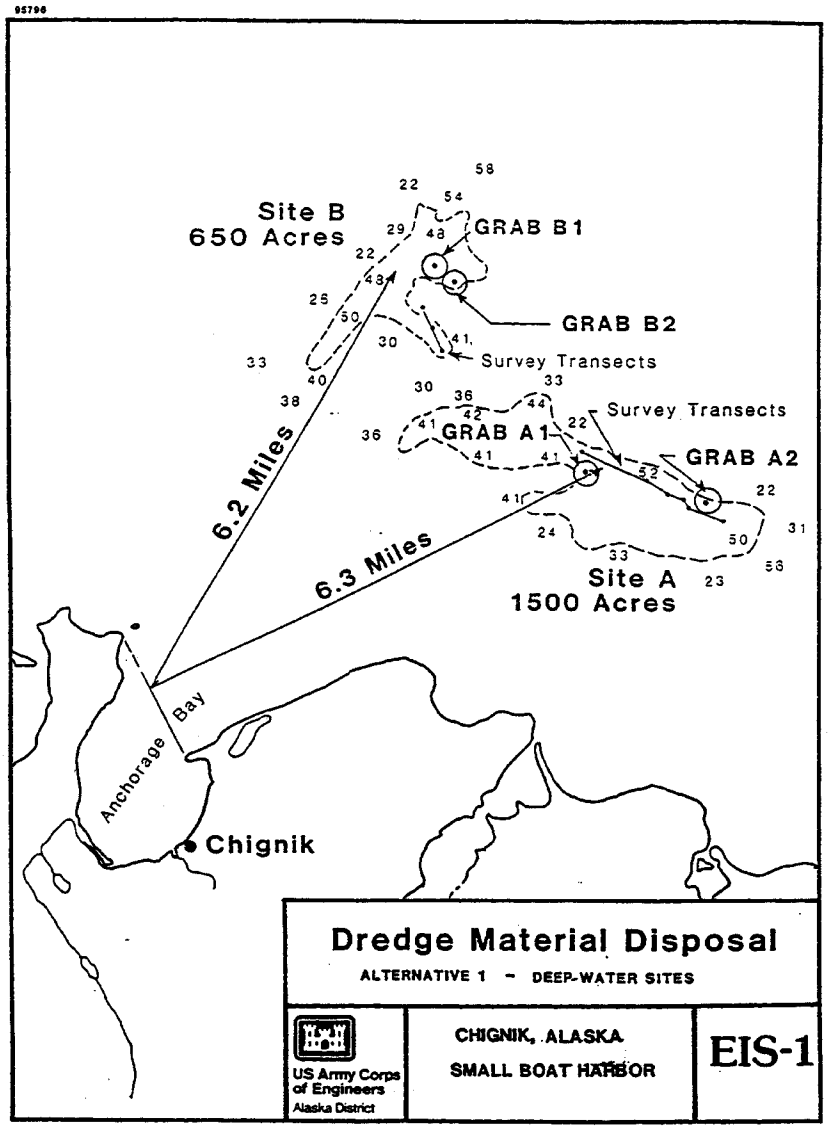
on a National Oceanic and Atmospheric Administration (NOAA) chart. The approximate transect locations are illustrated in figure EIS-1. A shallower (19-20 fathoms) transect was filmed within Anchorage Bay to compare habitats (figure EIS-2).

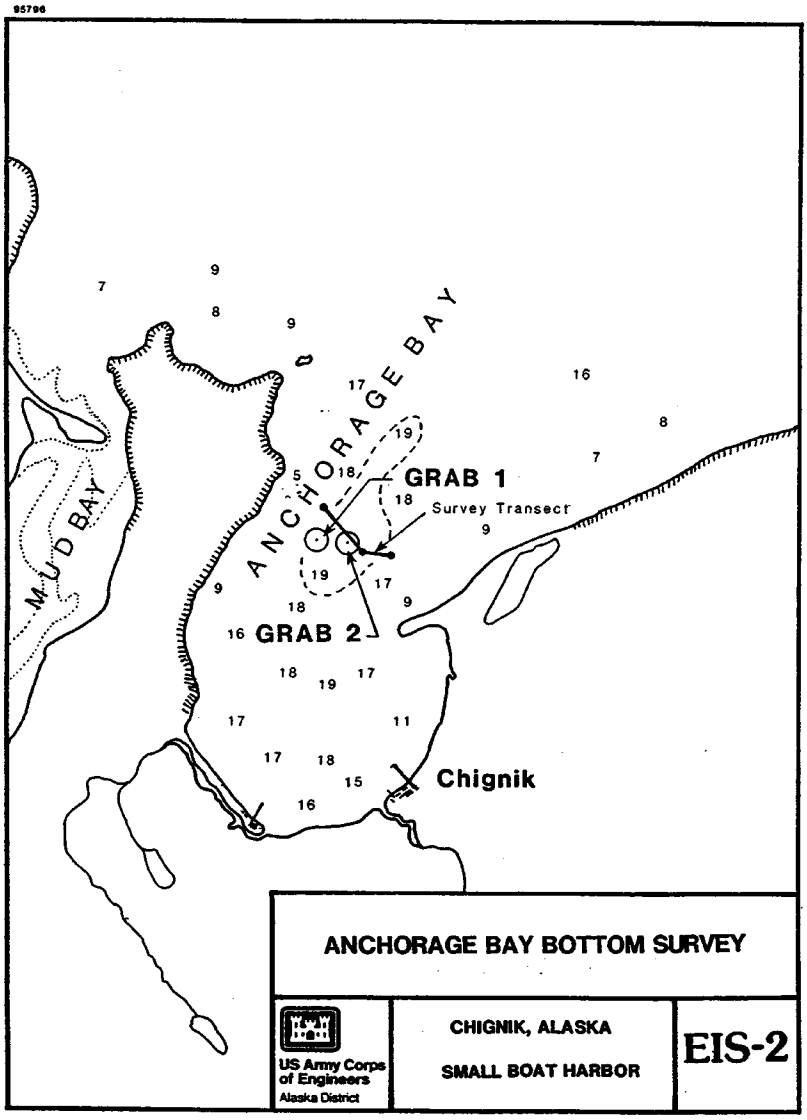
The bottom substrate at the deep-water site has a thin layer of productive sediments, predominantly silt over a thick anoxic silt mud layer. Areas A and B were surveyed. Interspersed among shell fragments are worm tubes and bivalve siphons. Tanner crab, small halibut, brittle stars, and shrimp occur occasionally. Steep-sloped areas between 30 and 35 fathoms are heavily littered with shell debris and support populations of scallops (*Chlamys* sp., *Pecten* sp.) and shrimp. The most numerous bivalve collected in bottom samples was *Nuculana pernula*. Other less numerous bivalves include species of *Macoma, Turbonilla* and *Turritellopis*. Identifiable shell fragments collected from samples included *Nuculana* and *Clinocardium*, with the former showing evidence of gastropod predation. Three unidentified species of polychaetes appeared abundantly throughout all the bottom samples obtained at site A. A subjective comparison of site B's benthic habitat with that of site A concludes that site B appears more diverse, as a rocky bottom commonly occurs as boulder patches or large heaps of rock slabs. Organisms inhabiting this habitat include encrusting bryozoans, sea urchins, sand dollars, sea anemones, scallops, tanner crab, flounder, and shrimp. Silty, featureless areas at site B support the same organisms associated with such habitat at site A.

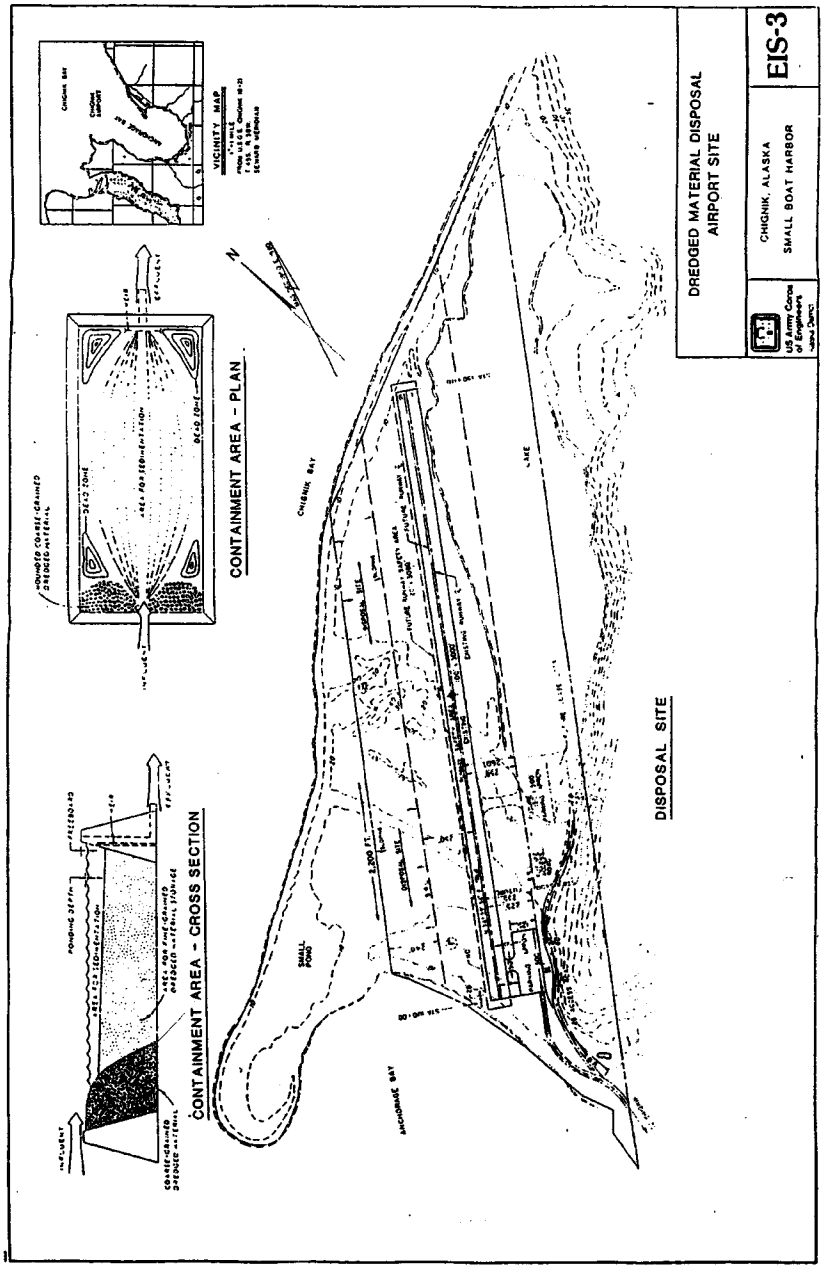
The shallower transect in Anchorage Bay had a sand/silt substrate with a deeper layer of productive sediments. Significantly more free-swimming and epibenthic organisms were observed. Those bottom-dwelling organisms observed included polychaete (tube worms), shrimp, brittle stars, halibut, sea pen, flounder, *Pycnopodia*, tanner crab, cod, gunnels, amphipods, and sole. King and tanner crabs overwinter in deep water and are known to inhabit Chignik Bay, as well as species of groundfish such as halibut, walleye, pollock, yellowfin sole, flathead sole, arrowtooth flounder, Pacific cod and sablefish.

In summary, the bottom habitat in the 40- to 50-fathom site is markedly less productive than at the 19-fathom site in Anchorage Bay. The habitat becomes progressively more productive with shallower depths.

3.3.2 Alternative 2 - Airport Site. This is an upland site located along the airstrip within the Alaska Department of Transportation and Public Facilities (ADOT-PF) right-of-way (figure EIS-3). The location of the disposal site with respect to the harbor site (site 2) and the community is shown in figure 4, main report. This area would be a stockpile site for the dredge material, which would be used as needed by the city of Chignik. The site is situated on an old beach ridge or bench, sparsely vegetated with beach rye grass. A small shallow pond/wetland is located to the north of the site. The substrate is primarily sand and gravel. Most of the material would be deposited between the northwest airport boundary and the building restriction line,


95798
Site B
650 Acres
GRAB B1
GRAB B2
Survey Transects
Survey Transects
GRAB A1
GRAB A2
6.2 Miles
6.3 Miles
Site A
1500 Acres
Anchorage Bay
Chignik
Dredge Material Disposal
ALTERNATIVE 1 - DEEP-WATER SITES
US Army Corps of Engineers
Alaska District
CHIGNIK, ALASKA
SMALL BOAT HARBOR
EIS-1


95796
ANCHORAGE BAY
MUD BAY
GRAB 1
Survey Transect
GRAB 2
Chignik
ANCHORAGE BAY BOTTOM SURVEY
US Army Corps of Engineers
Alaska District
CHIGNIK, ALASKA
SMALL BOAT HARBOR
EIS-2


DREDGED MATERIAL DISPOSAL
AIRPORT SITE
CHIGNIK, ALASKA
SMALL BOAT HARBOR
EIS-3
US Army Corps of Engineers
VICINITY MAP
CONTAINMENT AREA - PLAN
CONTAINMENT AREA - CROSS SECTION
DISPOSAL SITE
CHIGNIK BAY
LAKE
SMALL POND
ANCHORAGE BAY
INFLUENT
EFFLUENT
DEAD ZONE
AREA FOR SEDIMENTATION
POINDING DEPTH
FREEBOARD
COARSE-GRAINED DREDGED MATERIAL
AREA FOR FINE-GRAINED DREDGED MATERIAL STORAGE

which is 250 feet from the runway center line. Material deposited within the building restriction line would be used only to fill in existing non-wetland low areas. The main disposal area is approximately 2,200 feet long by 240 feet wide.

3.4 Threatened and Endangered Species

There are no threatened or endangered species or their habitats in the project area that would be affected by the proposed project. The Steller sea lion and previously mentioned species of whales do range in the general area. Correspondence is in appendix D.

3.5 Quarry Site

The current Alaska District Corps of Engineers policy is that quarry sites will not be designated or studied by the Government. The selected contractor for breakwater construction would have the option to either select an existing quarry for the rock, develop a new quarry source, or use a manufactured concrete armor system called Core-Loc in place of rock. In the final EIS for the Chignik Small Boat Harbor, Castle Bay was identified as a quarry site. The Castle Bay quarry site is no longer designated as the quarry alternative because of the Alaska District quarry policy. The 1989 DSEIS for the Chignik Small Boat Harbor evaluated the merits of using an unspecified existing quarry as compared to developing Castle Bay quarry. This report is incorporated by reference.

The EIS analyzed a typical existing quarry operation. Included was a comparative analysis of the generic quarry operation and the previously selected Castle Bay undeveloped quarry site. The operating procedures and the affected environmental conditions that could be present were described. The resources discussed were geology, surface and ground water, aquatic and terrestrial wildlife, vegetation, air quality, noise, cultural resources, visual intrusions, socioeconomics and wilderness/land use issues. Remedial/mitigative measures were listed. Resources of concern were developed by the Corps and the USFWS to indicate, if the listed resources are present, when an operating quarry should have a more exhaustive review.

Questions and concerns generated by the review of the 1989 DSEIS are addressed in this section. A generic quarry evaluation was developed to illustrate the relatively low impacts from a contractor obtaining rock from an existing operating quarry. This was not meant to evaluate all the existing quarries in Alaska. Each quarry would have to be evaluated by its quarry development plan at the time a specific existing quarry was selected by a government contractor. Agreements with State and Federal agencies are in place to review the quarry development plans after contractor selection. The generic quarry evaluation gives guidelines to judge potential impacts of an operating quarry on the environment. The Resources of Concern are the minimum evaluation criteria. The contention of the generic impact assessment is that

an operating quarry is the baseline, existing condition, and the commercial quarrying of rock is subject to State and local ordinances and controls, thus making the environmental effects insignificant. The environmental review would focus on the quarry development plan for obtaining and delivery of rock to the Federal project. Mitigative measures, some of which are described in the evaluation, are available on a case by case basis to lessen any additional impacts that might occur with the operation. It would not be possible to evaluate the mitigative measure's effectiveness unless it was directed to a specific quarry operation. Any development because of the Federal project would be subject to oversight review. A decision could be made through the initial review process that an additional NEPA document should be prepared and circulated. However, the extent of Federal control over a private sector quarry is not clear. A reviewer questioned how the Government could judge the economics of a project when a specific quarry is not known. The quarry policy has been tested in Alaska for several years and the economic analyses for a project have not been affected. The armor rock cost estimates are based on rock prices from several likely quarries.

3.6 Archeology

No cultural resources eligible for the National Register of Historic Places are in the project area.

3.7 Social/Cultural Resources

Chignik was established by non-Natives as a fishing village and cannery. The Fisherman's Packing Co. established itself in nearby Chignik Lagoon in 1888, and in the following years, three companies were present in the area. By 1896, the Pacific Steam Whaling Co. and the Hume Brothers cannery were located in Anchorage Bay. Many businesses closed during the 1920's. Today, Aleutian Dragon Fisheries and Chignik Pride own the two seafood processing plants that operate in Chignik.

Fishing is the mainstay of the cash economy of the village. Beginning around the second week in June, residents fish for red salmon and successional runs of pink, dog (chum), and silver salmon. Fish are taken in purse seiners and delivered to the local cannery or to floating processors anchored in Anchorage Bay. Boats, crews, and families from several area villages and elsewhere congregate in Chignik during the salmon season. Boats tie up to both cannery docks. There is not enough room for all the boats; therefore, boats tie up side by side or anchor in the bay. The economic well-being of the whole region depends on the success of commercial salmon fishing. Salmon runs have been good the last several years.

The Chignik people use the marine and coastal areas of their environment extensively for subsistence hunting and fishing. Subsistence is an important part of the residents' lifestyle, Native cultural heritage, and a major source of food. Salmon are caught by seining from spring until early winter. Marine fish, such as cod, black bass, and

halibut, are caught year-round. Rainbow trout are taken in winter and summer. Dolly Varden are caught during the summer and early fall. Residents fish for crab (Dungeness, king, and tanner) and octopus through the year. The east side of Anchorage Bay has productive butter clam beds. Moose, caribou, ptarmigan, ducks, and geese are hunted in season (villagers travel extensively for hunting). In the fall, residents pick blueberries, cranberries, mooseberries, and salmonberries.

4. ENVIRONMENTAL CONSEQUENCES

This section provides a summary of the potential physical, biological, and socio-cultural effects that would result from construction of a harbor at either of the two alternative sites. Particular emphasis is placed on the new harbor configuration (plan 2B) at site 2. Reduced wave height criteria at site 2 would correspondingly lower the breakwater height for plans 2A and 2B. The no-action alternative is also discussed.

4.1 Evaluation of the Chignik Boat Harbor Proposal

4.1.1 Benefits. The major benefit would be derived from harboring the Chignik fishing district boats in an all-season harbor. Boats would be protected from storms and overcrowded dock tieups, as well as having the benefit of winter storage. Off-season storage needs have led fishermen to moor in Seattle, Seward, Kodiak, Sand Point, and other harbors, or to pull boats into dry dock.

4.1.2 No Action. The no-action alternative would have no effect on the natural environment, but it would not solve the current problem of harbor facilities for the local fishing fleet.

4.1.3 Unavoidable Adverse Impacts. Varying amounts of intertidal/subtidal habitat would be affected as a direct result of all the project alternatives. Ocean currents and waves would be deflected by the breakwater, resulting in changes in water quality and circulation. Operation of the boat harbor could result in unknown amounts of heavy metals and hydrocarbons entering the water and bottom sediments. The occurrence of pollutants, reduced circulation, and the elimination of some habitat could result in a depression of benthic species diversity to favor species less sensitive to fluctuations in water quality and species more adapted to a low-energy environment. Water birds in the vicinity of the harbor would lose nesting and feeding habitat, particularly in the area of the freshwater marsh. Indirect disturbances caused by increased activities would deter use of the area and possibly lower habitat values. The effects on key elements of the environment have been described in the previously referenced documents. The following subsections describe and analyze the new plan 2B in comparison to plan 2A and the site 3 alternative.

4.1.4 Construction Scenario. The construction of any harbor alternative would require the use of a construction staging area for heavy equipment, including a barge and crane for breakwater placement, and either a clamshell or hydraulic dredge with vehicles or pipelines to transport the dredged material to the disposal site. The conceptual scenario is that the armor, secondary, and core material would be off-loaded from the barge to construct the breakwater. The basin would be dredged after the breakwater was completed. The access road and staging area would be the third phase. The construction camp would be located on property owned by the city of Chignik across the main road. This area would eventually become the main parking lot. The city of Chignik may also construct temporary quarters for construction workers near the Chignik airport.

4.2 Significant Resources

4.2.1 Freshwater Marsh.

Plan 2A. The peripheral fringes of the marsh would be unavoidably impacted by harbor construction. Access from the main road along the marsh to the staging area and harbor floats would affect marsh and sand dune vegetation. The road and staging area along the harbor would be approximately 1,035 linear feet. The staging area/road above high tide is estimated at 1.79 acres, which is included in the staging area total (4.4 acres). The ponds would be avoided. The perimeter road was the preferred route from the main road with this plan because of greater access to the harbor float system and the additional parking it afforded. The perimeter road is shown in the plan design, figure 5 in the FR. It is expected that only peripheral edges of the wetland would be affected by the road.

The north access road being considered as an alternative would require crossing a small salmon-supporting creek by placing a culvert. An arched culvert carefully designed to allow fish passage is the favored solution for crossing the stream.

A site-specific culvert design would include the hydrologic and physical characteristics of the creek to ensure fish passage. Degradation below the culvert outfall is a major problem at many culvert sites, as is increased water velocity caused by streambed constrictions. Lack of water in the culvert to provide access to spawning beds during low flows can also cause adverse impacts to fish. The Alaska Department of Fish and Game requires the invert of all culverts to be set below the streambed. Specifically, the inlet and outlet of round culverts must be buried at a depth of either 20 percent of the culvert's diameter or 18 inches, whichever is less. The invert of elliptical or arch culverts must be set at least 12 inches below the streambed. In most instances culverts up to 80 feet long must be set at an effective slope of not more than 1 percent. Culverts longer than 80 feet must be set at an effective slope of 0.5 percent or less.

The standard-width road (16 feet) would connect the main road to the staging area. The road would be placed on the highest point (+20 feet elevation), sloping down to the staging area at +15 feet elevation. The road's estimated length is 200 feet, with a 30-foot culvert. The road would avoid the wetlands, as much as possible, and already is an access point to the beach used by locals.

Indirect impacts to the marsh would be long-term in nature, caused by the increased human activities in the area. The consequences involve increased noise, littering in the marsh (including potential contaminants), and human traffic. Vegetation may be disturbed. Water quality of the streams and ponds might be lowered. All of the above would lower the wildlife habitat value of this wetland.

Impacts could be minimized by controls placed on the harbor/marsh area. The city of Chignik has designated the marsh as city park land and, therefore, could exercise controls, such as regular litter maintenance and fencing, to ensure that disturbance is kept to a minimum.

Plan 2B. The staging area for this design has been reduced in size. The north access road alternative with the culvert would be selected. It was determined that access to the harbor/staging is adequate with one vehicular access road and a footpath (boardwalk) on the south end. The footpath would lead from a city-owned parking lot across the main road to the harbor gangway and float system.

Site 3. This alternative is sufficiently distant from the marsh that no impact would occur.

4.2.2 Marine Intertidal/Subtidal Resources.

General. The construction of a boat harbor by placing breakwaters and dredging to a required depth, or any other construction-associated activity that disturbs the bottom sediment, increases turbidity. This construction activity can impact bottom-dwelling aquatic organisms, remove submerged vegetation beds, drive away fish and other mobile organisms, and alter the existing habitat.

Plan 2A.

Physical Impacts. The total affected area is estimated at 29.5 acres. Most of this area is tidelands and seabed. A small amount is upland staging area. The direct effects would be caused by dredging and filling in both intertidal and subtidal habitats to create the boat basin and entrance and access channels, thus destroying the organisms in these areas. Approximately 360,000 yd^3 of material would be dredged, 96,000 yd^3 of which would be placed as fill to create a 4.4-acre staging area in the tidelands and adjacent to the harbor.

Biological Impacts. Impacts on aquatic species identified in the area would be from water quality degradation, habitat loss, local food web disruption, and the direct elimination of organisms by dredging and filling. The productivity of the proposed breakwater alignment, basin, and channels is moderately high, with populations of bivalves, kelp, and eelgrass.

Recolonization after dredging would depend upon (1) adjacent undisturbed communities providing a source of replacement organisms capable of recolonizing the site by adult migration or larval recolonization; (2) water quality; and (3) substrate quality. The time frame and degree of habitat reclamation are unknown. However, any recolonization in the entrance channel would be disrupted every 10 years by the required maintenance dredging.

Plan 2B. This plan would occupy essentially the same area as plan 2A, with the same physical and biological effects. The breakwaters, moorage basin and staging area would occupy a little less tideland and sea bottom. Approximately 22.7 acres would be affected. The significant difference from plan 2A is that maintenance dredging would be eliminated because the shore-connected breakwater would prevent stream sedimentation from entering the harbor.

Site 3. Filling (161,000 yd^3) to create the rubblemound breakwater would bury 7 acres of subtidal seabed. To create the mooring basin and the access and entrance channel, 9 acres (approximately 212,000 $yd^{3)}$ of intertidal habitat and associated benthic organisms would be dredged. Dredged material would be used as fill to create a 1-acre staging area in adjacent tidelands. Excess dredged material would be disposed at the upland airport disposal site.

Biologically the two harbor sites are very similar. Site 3 has a rocky intertidal zone that provides habitat for more diversified organisms compared with site 2, where sand predominates, providing habitat for more clams. The surficial rocks at site 3 are the result of erosion from the cliff abutting the harbor site.

The key comparison of harbor design features concerns the different amounts of filling and dredging. Site 3, having deeper water, would require more breakwater rock and would require the harbor to be very long and narrow, but it also would allow dredging quantities to be reduced. Site 3 is in a more exposed location, so the wave height would require a higher breakwater.

4.2.3 Water Quality.

All Plans. Water quality would be affected during the construction phases of dredging and filling by the increase of suspended sediments. These sediments increase water temperatures, decrease light penetration, absorb carbon dioxide, and decrease pH levels. No ambient water quality data exist for the project area. However, there is no evidence of pollution sources in the area. Water quality

impacts would be high during construction of the project, but temporary because of sediment mixing and dispersal through tidal action.

Operation of the proposed harbor would have a long-term effect upon water quality. A decrease in alongshore littoral currents would result from breakwater construction. This decrease in water circulation, along with increased vessel activity and the release of harbor-related pollutants (paints, gas, grease, and oils from boats; discarded unsanitary debris and runoff from the staging area and the road) could greatly decrease water quality within the proposed harbor. To what degree depends upon tidal exchange within the basin and the proper handling of sewage, refuse, runoff wastes, and other pollutants. Fuel would not be dispensed at the harbor. Fuel is available to fishing vessels at the cannery docks. The new municipal dock would also provide fuel and sanitation facilities, making it unnecessary for the harbor to have bathrooms. Solid and petroleum waste containment and disposal would be provided at the harbor. All commercial unloading of fish would be conducted at the docks.

Circulation.

Plan 2A. The length-to-width (L/W) ratio of the basin is 2.3. The basin width is restricted due to rapidly increasing depths in Anchorage Bay; therefore, the L/W ratio is not adjustable by increasing the width of the harbor plan. Circulation within the harbor might be impeded, as L/W is greater than 2; however, circulation is improved by several design characteristics. A breach between the breakwater and shore was designed to provide adequate water depth for fish migration, and the toe of the staging area fill would be limited to elevations greater than 0.0 feet MLLW.

Changes to other parameters were made to increase the harbor's effectiveness in flushing. When the aspect ratio exceeds 2.0, it is recommended that a single asymmetric entrance be used with the entrance aligned parallel to the long axis of the basin. This plan's entrance channel is aligned parallel to the long axis of the basin. Rounded corners also were incorporated to enhance mixing of water within the basin to improve the exchange of water during normal tide cycles.

The ratio of the planform area (805 feet by 350 feet) of the basin (A), including the mooring area, access channel, and a portion of the entrance channel, to the cross-sectional area of the entrance channel (a) is as follows:

$$A/a = \frac{365{,}905\ ft^2}{3{,}880\ ft^2} = 94$$

A ratio of less than 400 indicates an optimal basin configuration for flushing. The Chignik basin, with A/a = 94, is well under 400.

A ratio used to evaluate the water quality expected in a harbor basin is the "tidal prism ratio" (TPR). It is an expression that evaluates the relative exchange of water due to tidal exchange. The TPR is defined as follows:

$$\text{TPR} = \frac{\text{(Basin volume at high tide - Basin volume at low tide)}}{\text{Basin volume at high tide}}$$

The TPR in the case of Plan 2A is difficult to define because it is not a completely enclosed basin. The TPR calculated for Chignik is 0.47. This indicates that approximately 47 percent of the basin water can be exchanged during a tidal cycle, assuming that water in the basin at low water is thoroughly mixed with ambient water on the flood tide. A TPR of 0.47 indicates very good basin flushing characteristics.

Plan 2A should provide adequate circulation and tidal flushing as designed. The mean tide range of approximately 8.0 feet, coupled with rounded basin geometry, a single asymmetric entrance parallel with the long axis of the basin, a breach between the rubblemound breakwater and staging area, a planform aspect ratio of 2.3, an A/a ratio of 94, and a TPR of 0.47 would provide optimum mixing characteristics and water exchange.

Plan 2B. Studies on harbor flushing and design indicate that centrally located single entrance channels into enclosed basins with good aspect ratios and rounded corners provide the best flushing. A single entrance channel creates velocities from the inflow jet that penetrate the farthest reaches of the harbor. The inflow jet causes gyres to form, mixing ambient waters with basin waters with every tidal cycle (Nece *et al.* 1979). The large tidal range is also a key benefit.

The numerical flushing calculations for Plan 2B are as follows:

L/W=2.6
A/a=102
TPR=.43

The numerical calculations indicate good flushing potential for the harbor configuration.

Site 3. The L/W ratio of the draft harbor concept for this site is even more restricted because of the greater depths at the site, resulting in a longer, narrower harbor. Numerical calculations were not done for this alternative configuration.

4.2.4 Fish. Salmon is of particular importance in this region. Studies indicated that juvenile salmon species use the shallows near shore for feeding and rearing before migrating into deeper water. Indian Creek, with a small population of pink salmon, is the largest stream in the area close to the harbor sites. Pink salmon

juveniles outmigrate when very small (35 to 40 millimeters), and therefore are very sensitive and vulnerable to predation. Pink salmon are noted for staying close to shore in shallow waters until they reach sufficient size to migrate offshore (usually 1 to 2 months).

The proposed basin and breakwater in all plans would change a relatively flat, sandy slope area of shallow water to a steep-banked deeper water habitat, which is not as suitable for rearing. Steep banks decrease the area of preferred shallow-water habitat and increase susceptibility of the fish to predation. Other impacts on juvenile salmon from the project include the loss of preferred food sources associated with the sandy substrate and eelgrass beds.

To offset some impacts caused by shoreline alteration with plan 2A, the breakwater is separated from shore, allowing shoreline access through the harbor during all but the minus tide stages for migrating fish. Studies have indicated that shore-connected breakwaters and bulkheads that extend into deep water may discourage small fry from migrating around them. Fry are attracted to the calmer waters within harbors, making water quality maintenance of key importance to protect area fisheries.

Plan 2B would have shore-connected breakwaters for wave protection and to prevent sedimentation from entering the harbor. To offset fish migration impacts, a breakwater toe or bench is designed to provide shallow water around the breakwater into the harbor. Figure 8 in the FR shows a cross section of the 8-foot bench. The bench would ensure shallow water around, into, and out of the harbor at a minimum of 0 ft Mean Lower Low Water. The breakwater would have a slope of 1V:1.5H.

Construction activities would be scheduled to avoid affecting use of the area by juvenile anadromous salmon. To avoid causing such impacts, in-water work is recommended to avoid spring migration (March 20 to May 15). No construction work would be conducted during the spring migration period. An adult salmon migration window (July 30 to September 10) is also recommended. A construction scenario to protect fish as much as possible but still take advantage of the summer construction season was discussed with the USFWS and the Alaska Department of Fish and Game. This scenario would be to start construction on May 16 on the southern breakwater, moving northward. Construction is expected to last 2 months per breakwater. Provided that the work on the southern breakwater has been completed, the northern breakwater can be constructed during the restricted period (July 30 to September 10). The shallow water conditions in the area would lessen fish disturbances because during low tides work can be conducted in the dry. After the breakwaters are constructed, the basin and entrance channel would be dredged.

4.2.5 Birds. Perching birds and water birds near the harbor would lose nesting and feeding habitat, particularly in the area of the freshwater marsh. Indirect disturbance caused by increased activities would deter use of the area and possibly lower habitat values.

4.2.6 Marine Mammals. The sea otters and seals in the vicinity would be less likely to use harbor waters because forage species would be reduced and harbor activities could be a deterrent.

4.3 Dredged Material Disposal Sites

Some of the dredged material would be disposed of in the intertidal and shallow subtidal areas for a staging area. With any of the harbor alternatives, there would be excess dredged material.

Both in-water and upland disposal locations were considered for the excess material. The upland airport disposal site is the preferred disposal site for the dredged material. The upland disposal site is the least environmentally damaging, even compared with deep-water disposal. In addition, the material would be available for local fill projects.

Disposal within the containment dike at this site (figure EIS-3) would smother the vegetation, which is sparse and composed primarily of grasses. No wildlife impacts would result. This would be a temporary stockpile. There are two alternative ways of disposing of the dredged material at this site: vehicle transport and hydraulic piping. The contractor would have the option between these two methods. The hydraulic method would require a near-shore pipeline and a confined disposal facility. The contractor would be required to monitor the effluent for turbidity levels to comply with Alaska water quality standards.

These standards state that turbidity shall not exceed 25 Nephelometric Turbidity Units (NTU) above ambient conditions beyond a reasonable mixing zone. Figure EIS-3 shows a plan and cross section of a dredged material containment area.

Another factor in dredged material disposal is the amount and quality of the dredged material. Plan 2A would require maintenance dredging. The material would be composed of coarse sand, which would not normally retain contaminants. However, over time in an operating harbor contaminants could accumulate, so sediment testing before maintenance dredging and disposal would be required.

4.4 Threatened and Endangered Species

According to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (NMFS), there are no known threatened or endangered species that would be adversely impacted by the proposed project. (See coordination letters, appendix D.) The NMFS stated that the Steller sea lion (listed after the 1987 EIS) would not be affected by this project (Brad Smith personal communication, 1995).

4.5 Quarry Site

No significant effects would be expected if an existing quarry is selected. However, another review is required and will be postponed until after the quarry is known.

4.6 Archeology

4.6.1 Site 2. Testing and mitigation of the site 2 archeological site (CHK-030) was conducted in September 1985, culminating in a determination of noneligibility for listing in the National Register of Historic Places.

4.6.2 Site 3. No impact.

4.7 Social/Cultural Resources

Moorage space for local fishermen would benefit the economic climate of Chignik. Owners who now transport their boats every season would be able to keep them year-round in Chignik. This opportunity may encourage seasonal residents to live year-round in the village. It may also encourage new people to settle in Chignik. However, due to land and housing shortages, this appears unlikely. Dependence on cannery-owned facilities, such as the docks, would be lessened. The municipal dock facilities would be available to all fishermen or other vessels.

Addition of the proposed harbor facilities would support the economic base of the community by providing work for the local labor force, by developing facilities to encourage expansion and upgrading of the commercial fishing industry, by promoting industrial development, and by improving transportation and waterborne commerce.

5. LIST OF PREPARERS

The preparers of this FSEIS and other important parts of the Chignik Small Boat Harbor feasibility study and report are listed in table EIS-4.

TABLE EIS-4.--*List of preparers*

Name	Discipline	Experience	Role in Preparing EIS, FR
Lizette Boyer	Biologist	Alaska District, Corps of Engineers, 13 years environmental studies	Principal preparer of FSEIS
Steve Bredthauer	Civil Engineer	Corps of Engineers, 17 years, 10 years Alaska District	Study Manager, Feasibility Report
Ken Eisses	Coastal Engineer	Alaska District, Corps of Engineers, 14 years	Harbor design
Laura Fairchild	Biologist	U.S. Fish and Wildlife Service, 6 years	Revised Fish and Wildlife Coordination Act Report
Janice Kara	Economist	Alaska District, Corps of Engineers, 2 years	Economic analysis
Harvey Smith	Coastal Engineer	U. of Wash., 10 years, Alaska Dept. of Trans., 13 years	Harbor design
Sofia Troutman	Economist	Alaska District, Corps of Engineers, 1 year	Economic analysis
Carolyn Rinehart	Writer/ Editor	Alaska District, Corps of Engineers, 11 years	Edited FSEIS, FR
Mel Zimmermann	Cost Estimator	Alaska District, Corps of Engineers, 10 years	Project costs

6. PUBLIC INVOLVEMENT

6.1 Public Involvement Program

A notice was published in the Federal Register dated February 16, 1995, to begin scoping for the DSEIS, Chignik Small Boat Harbor. The reinitiation of the harbor study was coordinated with the Alaska Department of Transportation and Public Facilities as well as the local Chignik community, which is the sponsor of the project. Letters about the project were sent to the interested public and State and Federal agencies for comment. The DSEIS had a 45-day public review starting with the notice in the Federal Register dated December 15, 1995.

6.2 Required Coordination

Pertinent Federal and State laws and statutes contained in table EIS-1 have been reviewed for the proposed project. Consultation correspondence is in appendix D. The USFWS has been involved with project planning throughout the project life under the authority of the Fish and Wildlife Coordination Act. Funding was transferred to the USFWS to revise the Final Coordination Act Report to include an analysis of the new alternative (plan 2B).

Under provisions of the Fish and Wildlife Coordination Act, the USFWS describes significant resources in the vicinity of the proposed project, identifies potential project impacts, and makes recommendations for avoiding or mitigating project impacts. The revised Coordination Act Report is in FSEIS appendix 2.

Section 404(b)(1) of the Clean Water Act, which discusses discharge of dredged or fill material, has been prepared for the new selected plan (plan 2B). Coordination and review under the State Coastal Zone Management Program will be concluded with the circulation of the final SEIS. A Certificate of Reasonable Assurance, Section 401 of the Clean Water Act, will be applied for during the final SEIS review.

Locally funded features, such as the inner harbor dredging and staging area, would require a Department of Army 404 permit. Additional details on layout would be finalized if needed during permit application. An expedited review is expected, since project features would be evaluated and reviewed in the draft and final SEIS.

6.3 USFWS Recommendations and Alaska District Corps of Engineers Comments

The USFWS recommendations in the revised Coordination Act Report follow:

a. Conduct hydrological modeling to ensure that proper flushing and water quality can be maintained with the preferred design.

b. Avoid dredged material deposition and staging area construction in the wetlands and ponds landward of the boat basin.

c. Dredging should not occur from March 30 to May 15 and July 30 to September 10 to prevent adverse impacts to migrating salmon. The south breakwater should be built first during the open construction window (May 15 to July 30). Harbor construction should then proceed from south to north since completion of the harbor northward would have fewer impacts to salmon. If necessary, construction on the north end of the harbor could be accomplished during the fall migratory window (July 30 to September 10). This construction scenario was revised after submittal of the USFWS Coordination Report.

d. Avoid impacts to or rerouting of the streams to the north and south of the boat basin during construction and future maintenance activities.

e. The following mitigative measures should be incorporated into the quarry plan: (1) construction camp and/or support facilities should be barge-based; (2) sorting yards and stockpiling of breakwater material should be confined to the borrow site's immediate area; and (3) disturbed land surfaces should be graded and seeded to promote vegetation and the regeneration of optimal fish and wildlife habitat.

f. Consult with the Service regarding construction within 1 mile of any bald eagle nest (where appropriate).

Alaska District, Corps of Engineers Comments:

a. The Alaska District believes the harbor's numerical calculations indicate good flushing and water quality. Modeling would be the ideal, and will be considered during the plans and specifications phase.

b. Agreed.

c. The vulnerability of the small numbers of out-migrating juvenile salmon justify the avoidance of this period (March 30 to May 15); however, the adult salmon are less vulnerable, and probably return in small numbers to the creeks. The contractor would start construction after May 15 on the south breakwater and move northward to avoid the southern stream during the July 30-through-September 10 period. Dredging of the entrance channel and inner harbor would be done after the breakwaters are constructed, so that timing restrictions should not be necessary.

d. There will be no rerouting of the stream beds except in the tidal delta. The delta formation would be affected by the breakwater. The streams would re-channel through the tidal delta, which would abut the breakwater. No maintenance activities would occur here.

e. The contractor is required by the Letters of Agreement on Quarries to submit its quarry selection and development plan for State and Federal review. If Castle Bay is selected, a review with these and other stipulations will be discussed.

f. Additional information about nesting eagle sites was collected. No bald eagle nests are within the project area.

6.4 Alaska Coastal Management Program Consistency Determination

The Chignik Small Boat Harbor design was reviewed under the Alaska Coastal Management Program (ACMP) in 1987 and found to be consistent (letters in appendix D). Another review will be conducted of the FSEIS with emphasis on the

tentatively selected plan 2B. The proposed harbor project at Chignik would be undertaken in a manner consistent to the maximum extent practicable with the ACMP.

This determination is based upon the description of the proposed project and its effect, and upon an evaluation of the relevant provisions of the management program.

6.5 Public Views and Responses

The local community feels a harbor in Chignik is essential to village development and to its economic well-being. The Department of Transportation has long supported the Chignik Harbor Project and was instrumental in the redesign of the breakwater. The city of Chignik reinitiated the study after many years and was involved in the planning and design. Few new issues surfaced in the scoping of the new alternative breakwater design. The Alaska Department of Transportation believed that a shore-connected breakwater was very important to deflect waves from the south and to prevent sediment from entering the harbor, thus eliminating the need for maintenance dredging. Juvenile salmon impacts caused by the breakwater had been a concern. Their preference for the littoral zone for migration and feeding needed to be considered in the breakwater design, either by a near-shore opening or some other structure to ease their migration around, into or out of the harbor. Juvenile fish are attracted to calm harbor waters. A bench concept was developed and designed into the breakwater to benefit migration.

6.6 Statement Recipients and Correspondence

The mailing list, pertinent correspondence, and public comments on the DSEIS and FR with Corps responses are in appendix D.

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(additional references for FSEIS only)

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1981 *Biological considerations for the Siting and Design of Marina and Affiliated Structures in Puget Sound.* State of Washington Department of Fisheries Technical Report No. 60.

Heizer, David W. and Earl L. Finn
1970 *Observations of Juvenile Chum and Pink Salmon in Marina and Bulkhead Areas.* State of Washington Department of Fisheries.

Nece, Ronald E. *et al.*
1979 *Effects of Planform Geometry on Tidal Flushing and Mixing in Marinas.* Technical Report No. 62, University of Washington, Seattle, Washington.

U.S. Fish and Wildlife Service
1995 *Chignik Small Boat Harbor, Revised Final Coordination Act Report.*

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
APPENDIX 1

CHIGNIK SMALL BOAT HARBOR
EVALUATION UNDER SECTION 404(b)(1), CLEAN WATER ACT

Chignik Small Boat Harbor, Chignik, Alaska
Plan 2B Alternative

1. PROJECT DESCRIPTION

A. General Description

The Chignik Small Boat Harbor project is proposed for construction on the east side of Anchorage Bay, a few miles from the village of Chignik. Chignik is on the Pacific side of the Alaska Peninsula, approximately 250 air miles southwest of Kodiak Island. The preferred project alternative is plan 2B at site 2. This 23-acre site would provide a harbor for the local salmon fishing fleet of approximately 105 vessels. Two curved breakwaters totaling 2,060 feet in length would be constructed out of rock or concrete manufactured Core-Loc, creating a 9-acre moorage basin. Dredging of approximately 317,600 cubic yards (yd^3) is required to achieve basin and entrance channel depths. A 2.3-acre intertidal staging area would be created from some of the dredged material (approximately 35,800 yd^3). An access road would be constructed from the main road to the staging area. The road would be 200 feet long and 16 feet wide. The small creek to the north of the harbor would require a 30-foot culvert. Peripheral areas of the wetlands could be affected by the road. The excess dredged material would be placed in an upland disposal site near the Chignik Airport. The sandy material would be stockpiled and used for various fill projects for the city of Chignik. The dredged material would be transported to the airport disposal area, either by truck or hydraulic pipe. If hydraulically piped, the water-laden slurry would be contained so that effluent could be controlled. Additional project descriptions are contained in the accompanying Draft Supplemental Environmental Impact Statement, Chignik Small Boat Harbor. Inner harbor facilities were designed by the State of Alaska Department of Transportation. The current plan includes several gangways, dolphins, and an extensive float system. These features would require approximately 100 permanent piles.

B. Description of Dredged and Fill Material

The project area is a flat sandy beach. Numerous soil borings in the project area indicate that the majority of material consists of sand and silty sand with gravel and boulders. No bedrock was encountered.

Fill material would consist of dredged material for the staging area. Armor stone would come from an unspecified quarry or a manufactured concrete called Core-Loc.

C. Description of the Proposed Discharge Site

The intertidal/subtidal zone in the proposed breakwater, moorage, and staging areas is classified as sandy unconsolidated bottom habitat. The substrate is predominantly sand with gravel, with lesser percentages of fines and boulders on the surface. The upper intertidal area is sparsely covered with barnacles, periwinkles, limpets, and blue mussels. In the mid- to lower intertidal zone, a prominent band of algae is attached to available rocks, including *Fucus* sp., *Alaria* sp., *Ulva* sp., and *Rhodemela larix*. The benthic fauna is a moderately rich and productive assemblage, including marine worms, marine snails, and the bivalve genera: *Macoma, Protothaca, Saxidomus,* and *Clinocardium*. This area also is used for local clam digging. Eel grass and kelp beds extend into the subtidal zone with similar benthic fauna. Nearshore fish species observed using this habitat are typical of the north Pacific seas, including Pacific cod, great sculpin, buffalo sculpin, yellowfin sole, starry flounder, rock greenling, masked greenling, and red and brown Irish lords. Unknown numbers of juvenile salmon are seasonal migrants in the area. Three species have been noted.

The preferred disposal site for the excess dredged material is an upland site near the Chignik airport. The alternative site is in a deep-water area 7 miles from shore in Chignik Bay. The 50-fathom site was investigated and found to be minimally productive. Disposal would take place over several acres.

The airport site is on the north side of the airstrip within the Department of Transportation right-of-way. The area is sparsely vegetated with grasses. The dredged material would be stockpiled for local use. There are two methods of dredging: clamshell or hydraulic. The clamshell dredge method uses a mechanical bucket that dumps onto tugs or barges. The hydraulic method creates a water-laden dredged material slurry that is transported through a pipeline to the disposal site. A specially designed disposal containment berm is required to control effluent and to assist in the settlement of the material. Figure EIS-3 shows a conceptual drawing of the containment berm. Methods of dredging and disposal site details would be submitted by the construction contractor.

No maintenance dredging is anticipated for this harbor project alternative.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

Construction of the breakwater, moorage, and staging areas would completely destroy benthos and the sandy flat habitat in those areas, estimated at a total of 22.7 acres. The breakwater would create a rock reef attractive to sessile organisms and rocky reef fish, which would eventually colonize it.

B. Water Circulation, Fluctuation and Salinity Determinations

The proposed breakwater is designed to deflect waves, creating a protected calm water area. Tidal fluctuation would maintain circulation, flushing, and water quality. Salinity concentrations would not change.

C. Description of the Proposed Discharge Site

The placement of fill for the breakwater and staging area would cause temporary sedimentation and turbidity in the water column. The breakwater fill material (armor stone, secondary stone, and core material) would be clean material with few fines. The breakwater would be constructed of large armor stone and smaller sized material for the core. The fine-grained material would cause sedimentation and turbidity. Tidal action and currents would disperse the material quickly with little effect. Light penetration in the vicinity would be reduced temporarily due to the turbidity. Dissolved oxygen would be slightly depleted due to absorption of oxygen molecules into silt particles or oxygen uptake by organic acids. Research has shown that oxygen depletion related to disposal of dredged material is a temporary occurrence, with oxygen levels usually returning to normal shortly after completion of the operation. Breakwater construction would be scheduled to avoid fish migration periods. Dredging of the moorage basin and entrance channel would occur after breakwater construction, so much of the suspended sediments and plumes would settle out within the confines of the breakwaters. Dilution and mixing with incoming water is expected to occur rapidly.

D. Contaminant Determinations

The fill material is not associated with any pollutants or toxicant, either natural or man-induced. The project site is in a moderately high energy environment; no known sources of pollutants are in the area. The sediments are predominantly course-grained, with little capacity for retaining contaminants.

E. Aquatic Ecosystem and Organism Determination

An increase in suspended sediments could cause a decrease in light penetration, which could impact plankton populations in the immediate project area. The impacts would be temporary and minor.

Free-swimming organisms would avoid the immediate area near the fill site because of the rise in turbidity, decrease in dissolved oxygen, increased agitation, and other disturbances to the substrate and water column. Most of these organisms would be able to avoid the area during the project. Impacts to the aquatic food web would be insignificant.

The proposed action would have no effect on endangered whales or the threatened Steller sea lion. No critical habitat for these species is in the project area.

F. Proposed Disposal Site Determinations

Dredging would take place mostly within the confines of the newly constructed breakwaters. Dredging the entrance channel at the mouth of the harbor would result in turbidity plumes out into Anchorage Bay. Water circulation derived from currents and wind is generally vigorous; therefore, plumes could be carried a considerable distance but would dissipate rapidly. Stratification is not a problem in the well-mixed cold waters. The predominantly coarse nature of the dredged material also aids in rapid settlement.

Dredged material from the moorage basin would be placed as fill to create the staging area. The same type of substrate and biota exist in this general area.

The preferred disposal site for the excess dredged material is an upland site. The disposal action could cause effluent to drain into waters of the United States; therefore, special conditions would be in place to monitor the effluent to meet water quality standards.

The proposed action would comply with applicable water quality standards and would have no detrimental effects on any of the following:

1. Municipal and private water supplies;

2. Recreational and commercial fisheries;

3. Water-related recreation; or

4. Esthetics.

The breakwater and staging area construction fill would have only a temporary effect on the water column. The breakwater would create rock reef habitat suitable for colonization. The staging area fill would create an upland area replacing the sandy tideland. Recreational and commercial fisheries would be positively affected by the harbor construction. Chignik is in a rich salmon-producing area. No parks, national or historical monuments, cultural resources, national seashores, wilderness areas, research sites, or similar preserves are located in the area.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

The harbor area would be permanently changed from tidelands to commercial/ industrial use. Harbor operations could degrade sediment/water quality over time. Sufficient flushing of harbor pollutants is expected. No fuel dispensing would occur

at the harbor. Solid waste and petroleum waste products would have appropriate containers on site.

H. Determination of Secondary Effects on the Aquatic Ecosystem

No significant secondary impacts are expected to result from the harbor construction. The marsh may experience declines in habitat use because of the increased activities in the area.

III. FINDING OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

A. Adoption of the Section 404(b)(1) Guidelines

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

B. Evaluation of Availability of Practical Alternatives

A draft and final environmental impact statement (EIS) was circulated in 1987. A draft supplemental EIS accompanies this evaluation. A discussion of the alternatives is contained in the reports. The selected alternative is the most practical alternative for the harbor needs in the Chignik area. Breakwater placement is the only practical solution for creating safe moorage in Chignik. Moorage facilities are water dependent. The staging area fill (generated by dredging the moorage basin) is needed to support the float system and for minimal parking and storage.

C. Compliance with Applicable State Water Quality Standards

The project complies with State water quality standards.

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

The proposed project complies with the toxic effluent standards of Section 307 of the Clean Water Act.

E. Compliance with the Endangered Species Act of 1973

The proposed project complies with the Endangered Species Act.

F. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research and Sanctuaries Act of 1972

The proposed project complies with the Marine Protection, Research and Sanctuaries Act of 1972.

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

Municipal and private water supplies would not be affected by this project. Recreation and commercial interests would benefit from the boat harbor facility. There would be no significant adverse impacts to plankton, fish, shellfish, wildlife, and/or special aquatic sites caused by this project.

The dredging and disposal aspects of this project would cause no significant adverse effects on aquatic life and/or other wildlife dependent on aquatic ecosystems.

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

All appropriate and practicable steps would be taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem. These include scheduling construction and dredging activities to avoid sensitive fish resource periods. Dredged material disposal containment would be designed so that water quality standards were met.

On the basis of the guidelines, the proposed breakwater construction fill, staging area fill, and moorage and entrance channel dredging are specified as complying with the requirements of these guidelines.

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
APPENDIX 2

CHIGNIK SMALL BOAT HARBOR
FISH AND WILDLIFE COORDINATION ACT REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services Anchorage
605 West 4th Avenue, Room 62
Anchorage, Alaska 99501

IN REPLY REFER TO:
WAES

NOV 21 1995

Ms. Lizette Boyer
Project Manager
Alaska District, Corps of Engineers
Post Office Box 898
Anchorage, Alaska 99506-0898

Dear Ms. Boyer:

In response to your request, we have reviewed the recommendations made in the draft Fish and Wildlife Coordination Act (FWCA) report for Chignik Small Boat Harbor (1995). Our project biologist, Laurie Fairchild, has contacted Wayne Dolezal, ADFG biologist, and Donald Braun, Chignik City Manager, regarding those recommendations. In a meeting held October 31, 1995, the three met to specifically discuss Recommendation 3, which prescribes timing windows for construction, to avoid adverse impacts to migrating pink salmon. It was mutually agreed the fall timing window could be adjusted and sequence of construction changed without additional impact to juvenile salmon, in the manner described below:

> To protect emigrating juvenile salmon, in-water work (dredging and/or filling) should not occur during the period March 30 through May 15. To protect immigrating adult salmon, in-water work should not occur during the period July 30 through September 10. The south breakwater shall be built first, commencing during the in-water construction window of May 16 through July 29. Harbor construction should then proceed from south to north since completion of the harbor northward will have fewer impacts to salmon. If necessary, construction on the north end of the harbor could be accomplished during the fall migratory window (July 30 to September 10).

In addition, Mr. Braun has collected information regarding bald eagle use of the surrounding cliffs. He concluded they may roost there, but are not nesting. The other area of uncertainty pertains to the quarry location. If a new quarry site is chosen, additional impacts will occur. These cannot be analyzed without site selection and a development plan. We urge the Corps to coordinate with the resource agencies an assessment of quarry impacts before committing resources to or authorizing quarry operations.

I believe this information will be valuable to your completion of the draft Environmental Assessment for the harbor project. Please contact Laurie Fairchild at 271-2788 if you have questions regarding our comments.

Sincerely,

Ann G. Rappoport
Field Supervisor

cc: Alaska Department of Fish and Game
National Marine Fisheries Service
City of Chignik

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services Anchorage
605 West 4th Avenue, Room 62
Anchorage, Alaska 99501

TAKE PRIDE IN AMERICA

IN REPLY REFER TO: WAES/F273

JUN 19 1995

Colonel Peter A. Topp
District Engineer, Alaska District
U.S. Army Corps of Engineers
Attention: Ms. Lizette Boyer
Post Office Box 898
Anchorage, Alaska 99506-0898

Re: Draft Fish and Wildlife Coordination Act Report: Chignick Small Boat Harbor

Dear Colonel Topp:

The document referenced above was prepared in accordance with the Fiscal Year 1995 scope of work and the FWCA [PL 85-624 Section 2 (b)], and is being provided for equal consideration of fish and wildlife conservation with other project purposes as planning proceeds. The document also contains the Service's Biological Opinion on threatened and endangered species, pursuant to Section 7 of the Endangered Species Act of 1973, as amended. No further consultation will be necessary if there are no significant changes in the project and mitigation recommendations are accepted.

Findings herein are based on information provided by Corps' project biologist, Ms. Lizette Boyer. Biological data are based on a literature review, site visits conducted during project planning in the 1980's, and previous FWCA reports for the project. This report is being coordinated with the National Marine Fisheries Service and the Alaska Department of Fish and Game. Please review the enclosed document and provide comments within 30 days. The Service will then provide a final FWCA report based on comments received. We have tentative plans to visit the site sometime in early August and will incorporate information from that site visit into the final report.

If you have questions or need more information, please contact project biologist Laurie Fairchild at 271-2788.

Sincerely,

Ann G. Rappoport
Field Supervisor

Enclosure

CHIGNIK SMALL BOAT HARBOR
Chignik, Alaska

Draft

Fish and Wildlife
Coordination Act Report

Submitted to:

Alaska District
U.S. Corps of Engineers
Anchorage, Alaska

prepared by:

Laurie Fairchild
Anchorage Ecological Services
Anchorage, Alaska

June 1995

Department of the Interior
U.S. Fish and Wildlife Service
Alaska Region

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Figure 5 - Breakwater Bench design 124

PREFACE

In September of 1983 the U.S. Army Corps of Engineers (Corps) produced a reconnaissance report on the feasibility and need for harbor facilities in Chignik. The 1983 report indicated a moorage demand for 70 commercial fishing vessels; an updated reconnaissance report has not been completed. In addition to the harbor, staging areas and access roads would be constructed to support the facility.

This Fish and Wildlife Coordination Act (FWCA) Report constitutes the U.S. Fish and Wildlife's (Service) report on the U.S. Army Corps of Engineer's (Corps) proposed small boat harbor at Chignik, Alaska. It has been prepared under the authority of the Fish and Wildlife Coordination Act, P.L. 85-624 Section 2(b), and in keeping with the spirit and intent of the National Environmental Policy Act.

Chignik has experienced increasing demand for a small boat harbor and associated facilities from commercial fishermen. The Service completed a FWCA report in June 1987 for this project. The Corps has modified the harbor design and has requested an updated FWCA report to aid its environmental analysis of the proposed project.

The purposes of the Service in study involvement are to 1) evaluate the prinicipal alternative's potential impacts on fish and wildlife resources and their habitats; and 2) update recommendations for mitigating adverse impacts to these resources. The Service's findings are based on a literature review and coordination with the Corps' Environmental Resources Section.

This document has been prepared as a supplement to the 1987 FWCA report for this project.

STUDY AREA

Chignik is located on the south side of the Alaska Peninsula at the head of Anchorage Bay (Figure 1). The project area is located on private lands within the U.S. Fish and Wildlife Service's (Service) Alaska Peninsula National Wildlife Refuge. Chignik is approximately 250 air miles southwest of Kodiak Island and 450 air miles southwest of Anchorage. The Chignik area is characterized by long mountain slopes and a maritime climate.

The project site is located near the base of a spit between the Chignik airport right-of-way and the northernmost stream in Anchorage Bay.

PLAN DESCRIPTION

Four geographic alternatives were presented in 1987, all utilizing the same detached breakwater harbor configuration (Figure 2). A detailed review of environmental impacts for each alternative can be found in the 1987 FWCA report. Under the current plan, only the harbor configuration and associated fill and dredge amounts have changed; the preferred location (Site 2) remains the same.

In the 1987 FWCA report, the Service recommended Site 3 as the least environmentally damaging. Both Site 2 and Site 3 utilized the same harbor design. The Service provided a set of recommendations that would sufficiently mitigate fish and wildlife habitat loss if Site 2 were selected as the preferred site. Site 2 is briefly described below as background for the two alternative harbor configurations and associated impacts evaluated in this report.

Design Alternative 1 (1987 Preferred Alternative)

The boat basin would be accessed from the south via a dredged entrance channel (Figure 3). A breakwater would extend 1,460 feet northward to the storage area. A break between these two structures would accommodate passage for salmon in the unnamed creeks bracketing the harbor.

The original harbor design (Figure 3) included a detached rubblemound breakwater, allowing water exchange from the north and south. The staging area was located to the north of the boat basin with additional fill extending along the shoreline in a rough outline of the ponds and wetland complex and finally connecting with existing public access to the south. A channel would be dredged at the south entrance to facilitate access.

The staging area would require approximately 12,700 cy of fill material and extend from the northern tidelands, along the basin and south to connect with an existing road for access.

Several methods for disposal of dredged material were evaluated including: 1) depositing a portion of the material intertidally to construct a staging area and access road, 2) stockpiling material upland for future use by the City of Chignik, and 3) depositing any remaining amounts in deep water (40-50 fathoms). Excess dredged material for this alternative was estimated at 264,000 cy in 1987.

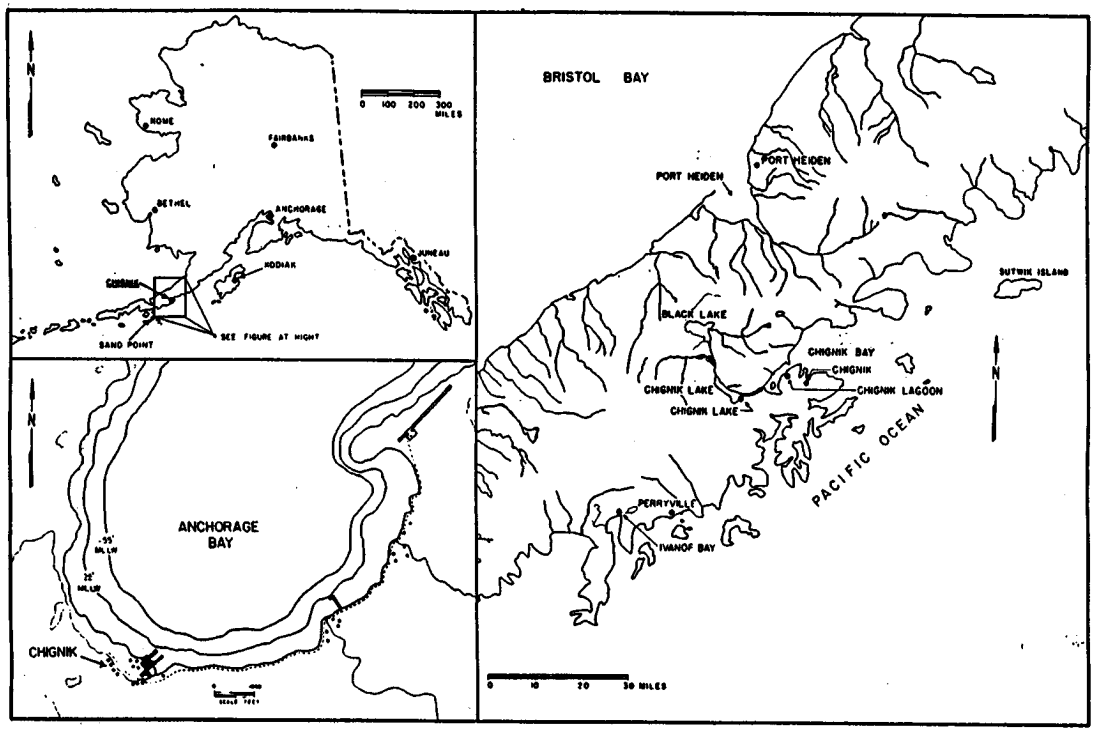


Figure 1. Chignik, Alaska and vicinity map.

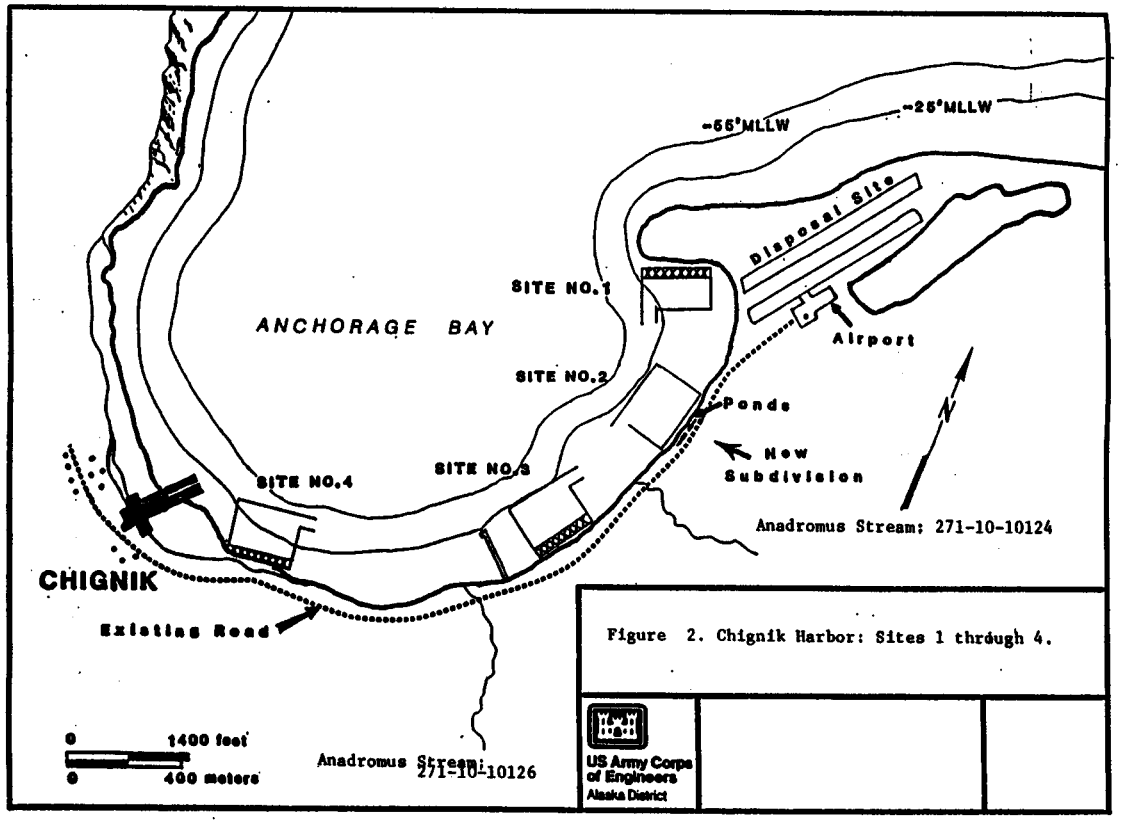


Figure 2. Chignik Harbor: Sites 1 through 4.

Design Alternative 2 (1995 Preferred Alternative)

The 1995 project site is identical to the proposed 1987 alternative. The difference lies in harbor configuration, which reverts to the more typical oval-shaped harbor with one centrally located entrance (Figure 4). This change from the 1987 design was made to address concerns regarding rapid sediment transfer and increased facility maintenance and boat repair costs due to wave action within the harbor.

The harbor (Figure 4) would be configured with a single central entrance/exit channel and would accommodate up to 112 vessels, compared to 70 vessels in Alternative 1. A staging area would be located on the north end of the harbor and would be linked to the existing village road by a 200-foot long access road. A culvert would be used to cross the small northernmost stream. The outer toe of breakwater walls would be crafted to provide an 8-foot wide bench replacing natural shallow-water habitat lost to harbor construction and used by migrating juvenile salmon (Figure 5).

Fill requirements for the breakwater and staging areas would be approximately 35,500 cubic yards, or 5,500 cys less than Alternative 1. Basin depths would remain similar to Alternative 1 (between -12 and -20 feet MLLW). Approximately 300,500 cys of material would be dredged for the boat basin, 55,000 cys less than Alternative 1. The Corp's early plans do not anticipate the need for maintenance dredging with this design.

BIOLOGICAL RESOURCES

Biological resources were discussed in detail in the 1987 FWCA report. A summary of those resources and additional information available since 1987 are presented here. Scientific names for all species are listed in Appendix A.

Project Area

Alpine tundra and thickets of willow, alder and resin birch are characteristic of vegetation surrounding Anchorage Bay. Wetlands occur mostly at the head of the bay and near the village airport. The Chignik area supports a variety of wildlife. However, no site-specific wildlife surveys are available regarding populations or range of birds and mammals. Accordingly, the lists below represent a partial accounting of species for the area.

Birds

Anchorage Bay is along the migratory route of a variety of ducks and geese, and is designated as important waterfowl habitat in the APNWR Comprehensive Conservation Plan (1985). The shoreline near Chignik is populated by wintering waterfowl and adjacent wetlands provide nesting habitat in summer months. Seabirds are seen occasionally in Anchorage Bay although there are no colonies nearby. Bald eagles frequent the streams feeding into Anchorage Bay during summer salmon runs and are also seen in winter months. Bald eagles may nest near the project site; however, no nests have been confirmed (pers. comm,

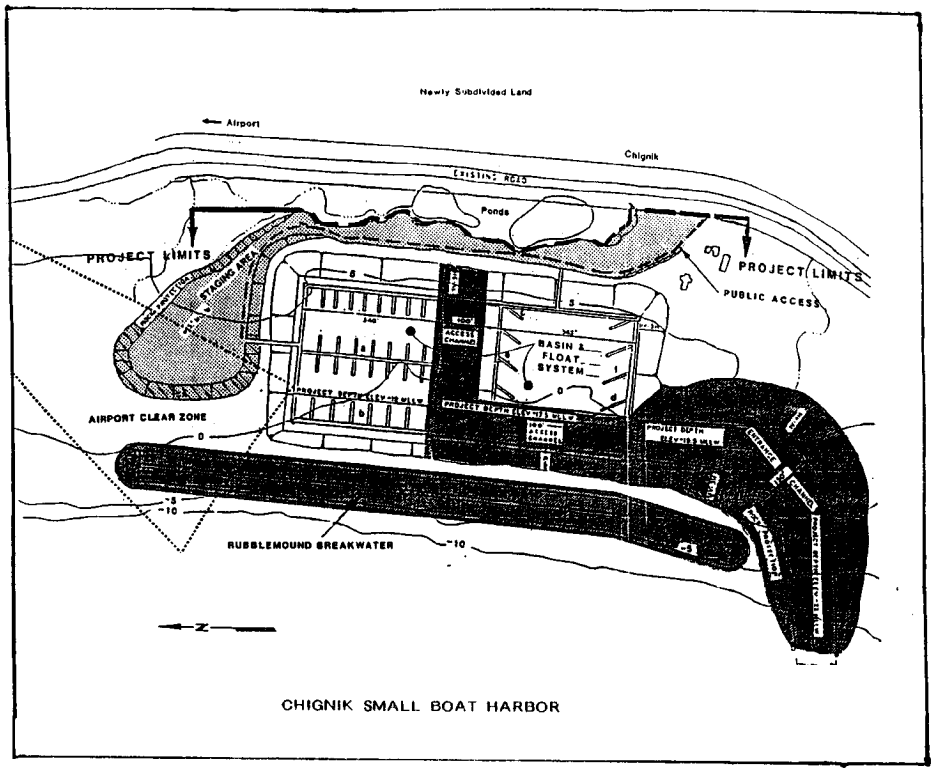
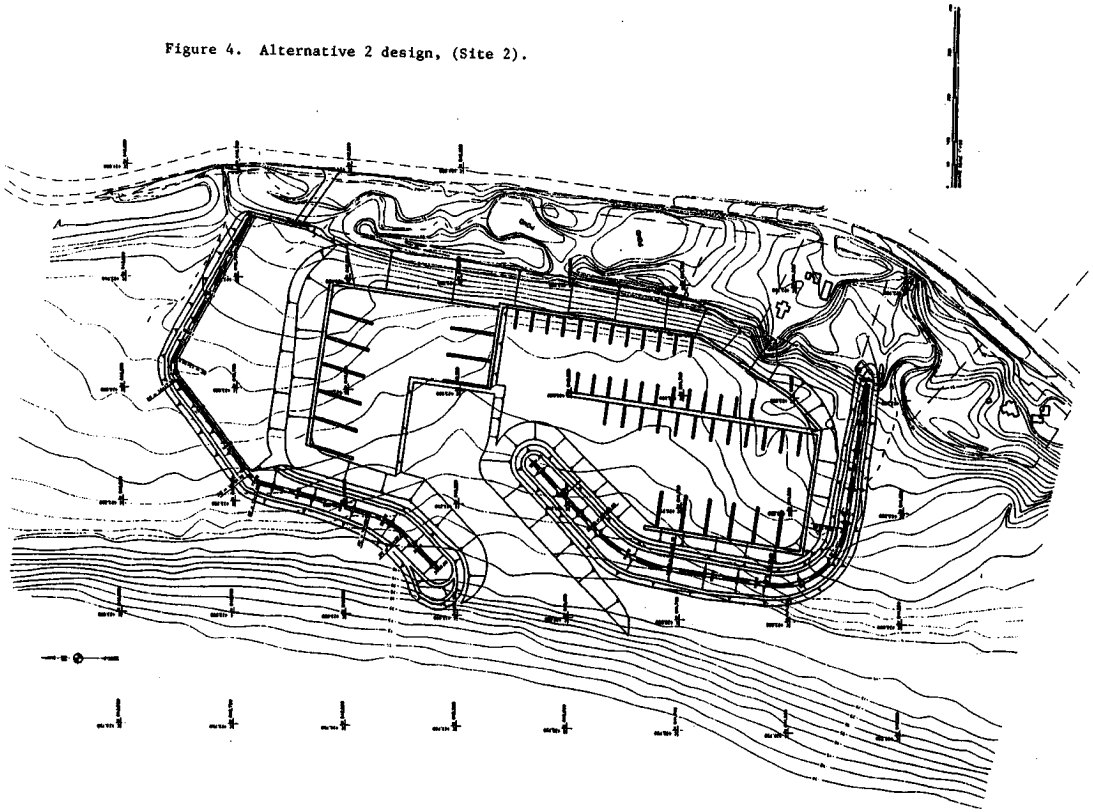


Figure 3. Alternative 1 design. (Site 2).

Figure 4. Alternative 2 design, (Site 2).



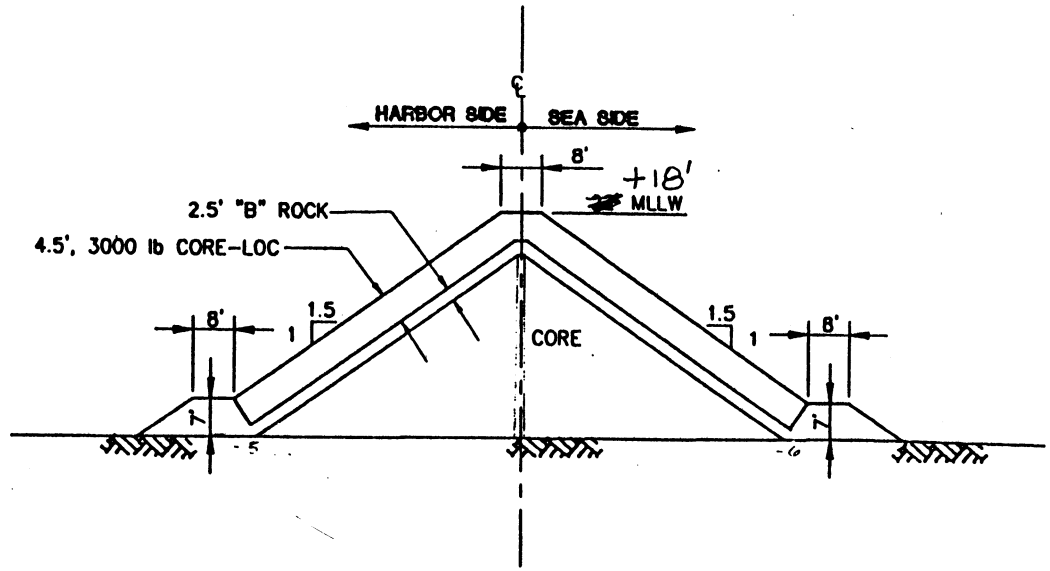


Figure 5. Cross section, bench design for fish habitat.

Rick Poetter). The following is a partial list of birds known to frequent the Anchorage Bay/Chignik area:

loon	cormorant
black brant	Canada goose
green-winged teal	Northern pintail
Steller's eider	harlequin duck
bald eagle	semipalmated plover
bar-tailed godwit	western sandpiper
least sandpiper	rock sandpiper
dunlin	common snipe
jaeger	Larus spp.
black-legged kittiwake	tern
common murre	marbled murrelet
Kittlitz's murrelet	puffin
golden-crowned sparrow	

Mammals

The Chignik Lake-Black Lake area supports one of the densest populations of brown bear in North America. The proposed project site is within the range of bears using this area. The following list details these and other mammal species occuring in the Chignik area and most are present year round:

brown bear	moose
caribou	red fox
porcupine	weasel
lemming	vole
ground squirrel	snowshoe hare
mink	river otter
beaver	muskrat

Aquatic Resources

All five species of North American Pacific salmon (pink, chum, coho, sockeye, and chinook) spawn in Chignik area streams. Three anadromous fish streams feed into Anchorage Bay. Indian Creek, located west of the village, supports pink salmon and Dolly Varden. Data representing size of fish stocks in Anchorage Bay streams is not available.

The 1987 FWCA report included an extensive description of the biota of Anchorage Bay and in particular, Alternative 1 (called Site 2 in that report). The project site is largely devoid of flora and fauna in the upper intertidal zone, graduating to low-medium densities of polychaetes in the lower intertidal zone. A diversity of bivalves, barnacles, eelgrass, and various algae as well as hermit crabs, dungeness crabs and sea anemones populate this zone. Additional fish species occurring near the project site include Pacific cod, rock greenlings, gunnels, starry flounder, rock sole and numerous sculpin species.

Marine mammals are abundant along the Alaska Peninsula coastline. Sea otters were observed within the project area during site visits in 1987. There are no marine mammal rookeries or haul-outs in Anchorage Bay.

Endangered, Threatened and Candidate Species

The project site is within the wintering range of the Steller's eider. This species is proposed for listing as threatened (59 FR 35896) under the Endangered Species Act of 1973, as amended.

The project site is also within the range of the following Category 2 Candidate species: harlequin duck, marbled murrelet, and Kittlitz's murrelet. Category 2 candidates are perceived to be subject to some threat, however the Service lacks sufficient information to propose listing. These species are provided for project planning purposes. However, it is unlikely these species would be directly impacted by the proposed project.

Anchorage Bay is within the range of the endangered humpback whale and threatened Steller sea lion. The National Marine Fisheries Service has management responsibility for these species and should be consulted before project construction for the most up to date information.

PROJECT IMPACTS

Under the Fish and Wildlife Coordination Act and the National Environmental Policy Act, the Service has responsibilities to identify impacts and make recommendations that, if implemented, would insure that project-related losses to fish and wildlife resources are mitigated (Appendix B).

Because both alternatives are expected to have similar impacts, we have chosen the same evaluation species and associated habitat to assess potential environmental impacts of the proposed project. Evaluation species in 1987 and here are 1) pink salmon 2) chum salmon, 3) sockeye salmon, 4) sea otter, 5) brown bear, and 6) northern pintail. Habitats associated with these species were designated as Category 3 due to their medium to high value to wildlife and relative abundance.

Evaluation species are chosen for their representation of typical wildlife use and interaction with a particular habitat type impacted by a proposed project. By mitigating environmental impacts to these species, it is likely that impacts to other species utilizing the same habitat types can be minimized. The project will impact four main types of habitat: 1) intertidal and nearshore/shallow waters; 2) offshore/deep waters; 3) coastal areas used by foraging mammals; and 4) the wetlands and pond complex between the proposed small boat harbor and existing village road.

Interruption of adult and juvenile salmon migration and elimination of shallow, protected waters for juvenile salmon are concerns at this site and will be addressed during following discussions of project design and mitigation measures. Temporary sediment load to deeper waters during construction and smothering of invertebrates through sediment transfer/settling and potential deep-water dredge material dumping are issues that may affect marine mammals such as the sea otter, which daily forages in such waters for food. Noise and increased human activity, especially at the Castle Bay quarry site, may adversely impact brown bears and potentially create a "problem bear" situation for field camp crew. Waterfowl and shorebirds using the wetlands and pond complex for nesting and staging habitat will be adversely impacted by harbor construction and may be displaced (to an

extent unknown without intensive study) given the percentage of persistent increased human activity at the small boat harbor. Degradation of wetlands due to changes in drainage patterns could also cause the area to become less valuable to birds.

Because of the aquatic nature of the project, salmon are expected to be most impacted. Loss of shallow, near-shore habitat appears to be the most direct impact as well as the project's possible influence on sedimentation patterns in the two streams bracketing the boat basin. Boat basins have been well documented as attractive to juvenile fish; accordingly, some level of impact to salmon species is expected (whether adverse or beneficial). Several studies have been conducted in Washington state regarding similar concerns and will be used in evaluation of project alternatives.

A minimum flushing rate of 30% appears essential to aquatic health to prevent accumulation of phytoplankton and introduced contaminants. Hydrologic modeling is recommended to determine if the current preferred harbor design meets this criteria. A list of the flushing criteria discussed in Cardwell and Koons is included as Appendix C.

Design Alternative 1

This design has been used in Puget Sound and other coastal areas to enhance water quality (increased circulation), fish passage, and mitigate for the loss of littoral habitat. This habitat is especially important to chum and pink salmon, which migrate immediately upon emergence and rely heavily upon the shallow near-shore waters during rearing. Given the proximity of the two creeks bracketing the boat basin, this habitat is expected to be of special importance during salmon out-migrating periods.

Dredge material disposal

Disposing of dredged material near shore would result in loss of rocky intertidal habitat of medium value to salmon, marine birds and sea otters. It would also cause a short-term water quality degradation problem.

Relatively little data is available documenting environmental impacts of deep water disposal. Dredge material disposed in deeper waters would be suspended in the water column short-term but would disperse over a wider range and have less chance to smother benthic organisims than other methods of disposal. Accordingly, this method would likely allow faster recolonization of benthic organisms found in offshore habitats. The Service has made past recommendations for deep water disposal over fill in wetlands and/or intertidal habitat.

Depositing dredge material around ponds and wetlands near the harbor basin would avoid direct impacts but cause degradation through secondary impacts. These include increased predation on eggs and adults and displacment of nesting waterfowl, such as northern pintails, due to human disturbance. Other predators (mammals and birds) may be attracted to trash and odors associated with the harbor and could also present increased predation problems for waterfowl using the wetlands and ponds.

Quarry sites

Impacts associated with quarry development include 1) construction of staging and sorting yards, 2) inter- and subtidal fills for barge access, 3) roads and support facilities and 4) blasting. Human/wildlife interactions could also cause disturbance, especially to bears. Food and construction camp waste should be properly disposed of to avoid attracting bears. Blasting disturbance may cause bears and other mammals, such as fox, to restrict their normal foraging territories. This issue was discussed in the 1987 report for the potential Castle Bay quarry site.

The Corps' policy of designating quarry sites for projects has changed since the 1987 project review. The Corps now leaves site selection and permit responsibilities to the contractor.

Design Alternative 2 (Preferred Alternative)

Boat basins with a single entrance/exit channel have historically been of concern for three main reasons: 1) water quality degradation due to poor water circulation and introduced contaminants; 2) fish entrapment; and 3) increased fish predation and mortality caused by disruption of normal habitat. Cardwell and Koons (1981) summarized several studies in their report on biological considerations for marinas which showed that fish entrapment and predation were not significant concerns. They believed water quality was the single most important factor governing biological health in boat basin design and presented several design standards that, if implemented, would provide adequate flushing. Alternative 2 incorporates several of the recommended provisions, specifically: 1) rounded corners to aid natural water circulation patterns, and 2) a bench at the outer toe and around the entrance corners of the breakwater to approximate littoral habitat being displaced by construction. Once inside, a bench becomes unnecessary as the harbor is protected and attractive to juvenile fish as mentioned above.

Dredge material disposal

Impacts would be similar to those described in Alternative 1.

Quarry sites

Environmental impacts would be similar to those for Alternative 1.

SUMMARY

In general, environmental impacts are not expected to be significantly different between Alternatives 1 and 2. However, the Service recommends Alternative 2 be chosen as the preferred alternative for the following reasons: 1) Change in harbor design and subsequent restriction of fish passage in Alternative 2 should be offset by the breakwater bench design to approximate natural habitat for juvenile fish; 2) Alternative 2 would decrease the direct impacts to the pond/wetlands complex between the staging areas; 3) it appears that a single entrance harbor design is capable of providing adequate flushing and water circulation; 4) fill and dredge requirements are less with this alternative, therefore lessening the overall direct and indirect impacts of the proposed project, and 5) maintenance dredging will not be required, thereby lessening future, cumulative impacts to the aquatic system near Chignik.

It appears that health of aquatic communities within and influenced by marina construction/operation rely heavily on adequate flushing to maintain water quality. Studies of boat harbor designs suggest adequate flushing can be maintained with either design alternative discussed in this report. Finding the best harbor configuration can best be done through hydrological modeling. This method can be fine tuned by considering all aspects of the geographic location, (e.g., water temperature, stream sedimentation and circulation patterns).

The Castle Bay quarry site is not specifically mentioned in the Corps' description of Alternative 2 but is a likely choice by a contractor. As identified in the 1987 FWCA report, the developing contractor should not disturb the heavily vegetated alluvial fan which supports fox populations and contains tide pools. The Corps' should ensure the contractor's compliance with the State's coastal zone requirement that requires the project proponent to submit a quarry development plan for any new quarry opened associated with the project.

SERVICE POSITION AND RECOMMENDATIONS

The following recommendations should be included in project planning to mitigate adverse impacts to fish and wildlife resources, loss of aquatic habitat, and increased human disturbance at the proposed project site.

1. Conduct hydrological modeling (beyond the scope of this study) or statistical calculations to ensure that proper flushing and water quality can be maintained with the preferred design.

2. Avoid dredge material deposition and staging area construction in the wetlands and ponds landward (east) of the boat basin.

3. Dredging should not occur from March 30 to May 15 and July 10 to August 30 to prevent impacts to out-migrating juvenile salmon. Construction may occur on the northern arm of the breakwater only during the period of July 10 to August 30; if the north breakwater is completed prior to August 30, the contractor may not continue construction until consulation with and approval from the Corps of Engineers, Alaska Department of Fish and Game, and U.S. Fish and Wildlife Service.

4. Avoid restriction or rerouting of the main streams to the north and south of the boat basin during construction and future maintenance activities (if any).

5. The following mitigative measures should be incorporated into the quarry plan: 1) construction camp and/or support facilities should be barge-based; 2) sorting yards and stockpiling of breakwater material should be confined to the borrow site's immediate area; and 3) disturbed land surfaces should be graded and seeded to promote vegetation and the regeneration of optimal fish and wildlife habitat.

6. Consult with the Service regarding construction within one mile of any bald eagle nest (where appropriate).

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Appendix A

WILDLIFE OF CHIGNIK, ALASKA

Common Name	Scientific Name
pink salmon	Oncorhynchus gorbuscha
chum salmon	O. keta
coho salmon	O. kisutch
sockeye salmon	O. nerka
chinook salmon	O. tshawytscha
Pacific cod	Gadus macrocephalus
rock greenling	Hexagrommos lagocephalus
gunnels	Pholis spp.
starry flounder	Plytichthys stellatus
rock sole	Lepidopsetta bilineata
sculpin	Cottus and Clinocottus spp.
sea otter	Enhydra lutris
humpback whale	Megaptera novaeangliae
Steller's sea lion	Eumetopias jubatus
harbor seal	Phoca vitulina
brown bear	Ursus arctos
caribou	Rangifer tarandus
moose	Alces alces
wolf	Canis lupus
wolverine	Gulgulo
river otter	Lutra canadensis
beaver	Castor canadensis
red fox	Vulpes vulpes
mink	Mustela vison
muskrat	Ondatra zibethicus
Alaskan hare	Lepus othus
arctic ground squirel	Spermophilus undulatus
hoary marmot	Marmota caligata
least weasel	Mustela nivalis
porcupine	Erethizon dorsatum
shrew	Sorex spp.
vole	Microtus spp.
Brown lemming	Lemmus sibiricus
common loon	Gavia immer
yellow-billed loon	G. adamsii
Pacific loon	G. arctica
red-throated loon	G. stellata
red-necked grebe	Podiceps grisegena
double-crested cormorant	P. auritus
pelagic cormorant	P. pelagicus
red-faced cormorant	Phalacrocorax urile
sandhill crane	Grus canadensis

WILDLIFE OF CHIGNIK, ALASKA
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Common Name	Scientific Name
tundra swan	Cygnus columbianus
white-fronted goose	Anser albifrons
snow goose	Chen caerulescens
canada goose	Branta canadensis
mallard	Anas platyrhynchos
gadwall	A. strepera
green-winged teal	A. crecca
American wigeon	A. americana
Northern pintail	A. acuta
greater scaup	Aytha marila
common eider	Somateria mollissima
king eider	S. spectabilis
Steller's eider	Polysticta stelleri
black scoter	Melanitta nigra
white-winged scoter	M. fusca
harlequin duck	Histrionicus histrionicus
oldsquaw	Clangula hyemalis
Barrow's goldeneye	Bucephala islandica
common goldeneye	B. clangula
red-breasted merganser	Mergus serrator
bar-tailed godwit	Limosa lapponica
yellowlegs	Trina spp.
short-billed dowitcher	Limnodromus griseus
common snipe	Gallinago gallinago
black turnstone	Arenaria melanocephala
rock sandpiper	Caladris ptilocnemis
dunlin	C. alpina
least sandpiper	C. minutilla
red-necked phalarope	Phalaropus lobatus
glaucous-winged gull	Larus glaucescens
black-legged kittiwake	Rissa tridactyla
common murre	Uria aalge
thick-billed murre	U. lomvia
pigeon guillemot	Cepphus columba
marbled murrelet	Brachyramphus marmoratus
Kittlitz's murrelet	B. brevrostris
horned puffin	Fratercula corniculata
tufted puffin	F. cirrhata
bald eagle	Haliaeetus leucocephalus
northern harrier	Circus cyaneus
rough-legged hawk	Buteo lagopus
osprey	Pandion haliaetus
merlin	Falco columbarius
peregrine falcon	F. peregrinus
gyrfalcon	F. rusticolus
willow ptarmigan	Lagopus lagopus
rock ptarmigan	L. mutus
short-eared owl	Asio flammeus
snowy owl	Nyctea scandiaca

WILDLIFE OF CHIGNIK, ALASKA
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Common Name	Scientific Name
bank swallow	Riparia riparia
common raven	Corvus corax
water pipit	Anthus spinoletta
American dipper	Cinclus mexicanus
yellow warbler	Dendroica petechia
Wilson's warbler	Wilsonia pusilla
song sparrow	Melospiza melodia
fox sparrow	Passerella iliaca
common redpoll	Carduelis flammea
golden-crowned sparrow	Zonotrichia atricapilla
lapland longspur	Calcarius lapponicus
snow bunting	Plectrophenax nivalis
gray-crowned rosy finch	Leucostricte arctoa

APPENDIX B. Fish and Wildlife Service Mitigation Policy Synopsis.

Under the Fish and Wildlife Coordination Act and the National Environmental Policy Act, the Fish and Wildlife Service (Service) has responsibilities to ensure that project-related losses to fish and wildlife resources are identified and mitigated. As part of our participation in project planning, a mitigation plan should be developed in accordance with the Service Mitigation Policy (FR Vol. 46, No. 15, January 23, 1981) and in consultation with the Environmental Protection Agency and alaska Department of Environmental Conservation. The plan would provide guidance for evaluating and mitigating impacts of the proposed project to fish and wildlife.

A mitigation plan is developed by first selecting fish and wildlife habitats from among the full range of habitats occurring within the area to be impacted by both direct as well as indirect impacts. These are chosen either because they represent resources which are most characteristic of the area or because the Fish and Wildlife Service has mandated responsibilities for them. By narrowing the scope in this way, the analysis can focus on areas where significant changes are most likely to occur and not be unduly burdened by inclusion of areas with low wildlife value.

After identifying important habitats, evaluation species, which function as indicators of habitat quality and quantity, are chosen, Selection of evaluation species has an important role in determining the extent and type of mitigation achieved. A combination of two sets of criteria is typically used to choose species for this purpose. The first is to pick species with high pubic interest, subsistence, or economic values while the second is to select species which utilize habitats having significant ecological values.

Fish and wildlife habitats are then assigned to one of the four Resource Categories delineated in the Service Mitigation Policy (Table A-1). Designation of habitat into Resource Categories ensures that the level of mitigation recommended is consistent with the value of the habitat and its relative abundance on an ecoregion or national basis.

The determination of the relative scarcity or abundance of the evaluation species' habitat from the national perspective is based on 1) the historic range and habitat quality, and 2) the current status of that habitat. A significant reduction in either the extent or quality of habitat for an evaluation species indicates that it is scarce or becoming scarce, while maintenance of historical quantity and quality is the basis for considering it abundant.

For all Resource Category 1 habitat, the Service will recommend that all losses of existing habitat be prevented, as these one-of-a-kind areas cannot be replaced. Insignificant changes that do not result in adverse impacts on habitat value may be acceptable provided they will have no significant cumulative impact.

Specific ways to achieve the mitigation goal for Resource Category 2 when loss of habitat value is unavoidable include 1) physical modification of replacement habitat to convert it to the same type which was lost, 2)

restoration of rehabilitation of previously altered habitat, 3) increased management of similar replacement habitat so that in-kind value of lost habitat is replaced, or 4) a combination of these measures. By replacing habitat value losses with similar habitat values, populations of species associated with that habitat may remain relatively stable in the area over time.

The mitigation goal of in-kind replacement of lost habitat, however, cannot always be achieved. When opposition to a project on this basis alone is not warranted, deviation from this goal may be appropriate. Two such instances occur when either different habitats and species available for replacement are determined to be of greater value than those lost, or when in-kind replacement is not physically or biologically attainable in the ecoregion. In either case, replacement involving different habitat kinds may be recommended, provided that the total value of lost habitat is compensated.

For Resource Category 3, in-kind replacement of lost habitat is preferred though not always possible. substituting different habitats, or increasing management of different habitats so that the value of the lost habitat is replaced,1 may be ways of achieving the planning goal of no net loss of habitat value.

For Resource Category 4, the Service will recommend ways to avoid impacts or to immediately rectify them or to reduce or eliminate them over time. If losses remain likely to occur, then the Service may make a recommendation for compensation, depending on the significance of the potential loss. However, because these areas possess relatively low habitat values, they will likely exhibit the greatest potential for significant habitat value improvements. Service personnel will fully investigate these areas' potential for improvement, since they could be used to mitigate Resource Category 2 and 3 losses.

Proposed provisions to maintain water quality in marina design (from Cardwell and Koons, 1981).

1. The gross exchange coefficient of the marina for a 1.82 m (6.0 foot) tidal range should average >30% and the lower 95% confidence limits for all local exchange coefficients should be >15% (Cardwell, 1980b). Local exchange coefficient estimates should be based upon samples collected randomly from the model and statistically represent all possible coefficients for the 1.82 m tidal range. In addition, another tidal range should be modeled that validly represents the minimum anticipated for two consecutive tidal cycles (e.g., over 24 hour) during May through September, the period when water quality degradation is most probable.

2. Marinas should have rounded rather than square corners in order to exploit the natural hydraulic patterns of flow and prevent occurrence of areas where flushing is negligible.

3. The marina's aspect ratio, i.e., the ratio of its length to breadth, should be greater than 0.33 and less than 3.0, preferably between p.5 and 2.0.

4. If it is suspected that currents in channels bordering marinas will affect flushing, they should be simulated in the hydraulic modeling to prevent the possibility of short-circuiting. Short-circuiting is the flow of water in one entrance of the marina and out the other without exchanging with other waters within the marina basin. This could lead to stagnation and water quality problems. If these currents are not simulated, the marina's design--e.g., the location, number and dimensions of entrances, should assure the flushing cannot be impaired by currents.

5. The depth of the marina basin should be less than or equal to the depth of the source water nearest the marina's entrance in order to prevent water quality degradation in the marina's deepest waters.

(Cardwell and Koons report should be consulted for further explanation).

APPENDIX B
ECONOMIC ANALYSIS

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APPENDIX B
ECONOMIC ANALYSIS

1. COMMUNITY PROFILE

The purpose of this section is to provide general background information pertaining to the socioeconomic composition of the study area. A general discussion of this information is necessary to enable planners and report reviewers to gain an understanding of the community infrastructure, the level of economic activity generated from this small rural community, and the potential of the area to support the project under consideration.

1.1 Government

Chignik was incorporated as a second-class city in May 1983. This form of city status is typically given to smaller rural communities within the State. Currently there are more than 200 second-class cities in Alaska. The decision of the residents of Chignik to incorporate has had a positive effect on the community. The city was able to establish municipal boundaries, undertake development projects to improve and expand public services, promote housing construction through available Federal programs, and generate significant income through the Alaska Fisheries Business Tax (also known as the State raw fish tax).

As a second-class city the community is governed by a seven-member city council, with one member serving as mayor. Day-to-day operations of the city are conducted by a full-time city administrator and a staff of six, two of which serve part-time. Available public services in Chignik include police and fire protection, electricity, water, sewer, solid waste disposal, and, in cooperation with the Bristol Bay Area Health Corporation, a health clinic. For fiscal year 1995 (from July 1994 through June 1995) the city had an operating budget of $394,361. Administration consumes 33 percent of the operating budget, 14 percent is used for the community hall, and the balance supports other services.

Four other fishing villages--Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay--lie within the study area. These five communities make up the Chignik economic area. Fishermen from all five communities fish the same waters, harvest the same resources, share a similar historical and cultural background, and have close family ties. Because Chignik is the only incorporated community and is the commercial, transportation, and population hub of the study area, the city of Chignik is the primary focus of this report. However, boat owners who reside in the other four communities support the harbor directly and through the Lake and Peninsula Borough.

The Alaska Fisheries Business Tax provides the City of Chignik with most of its operating revenue. Other revenue sources include state revenue sharing and municipal assistance, Lake & Peninsula Borough revenue sharing, and equipment rent. The city receives rent from the Federal Government for its sub-regional clinic; however, the rent money has to be spent for the clinic facility and its operations. Total general fund revenue in fiscal year 1995 will approximate $400,000.

Funding for the local sponsor's share of the proposed harbor project is expected to come from several sources. The majority will come from State appropriations, though no legislative action has been taken at this time. The second most important source is the Lake and Peninsula Borough. The third source is the city of Chignik and the surrounding communities. These communities have sufficient revenue-generating capacity to cover project operating and maintenance costs.

1.2 Police Protection

Police protection for Chignik residents is provided by a full-time village public safety officer (VPSO). This position is funded by the State and administered by the Bristol Bay Native Association (P.O. Box 310, Dillingham, AK 99576). Operational control, training, and assistance are provided by the Alaska State Troopers. A State Trooper stationed in King Salmon visits Chignik at 2-month intervals or as needed. Transients, primarily fishermen and seafood processors, are required to adhere to established standards of conduct. Infractions generally result in termination. Because of this policy of the processors, similar policies of boat owners and skippers, and the presence of a full-time VPSO, transients create few problems. Social sanctions regulate the conduct of year-round residents.

1.3 Fire Protection

Fire protection in Chignik is provided by a volunteer fire department of 4 to 10 persons. There are two water systems in Chignik, with approximately 30 hydrants between the two systems. Mains of the older system are scheduled to be upgraded before the end of Federal fiscal year 1996. A 1,000-gallon-per-minute triple combination pumper is on hand for fires and other emergencies. The city is in the process of acquiring a second, smaller pumper.

1.4 Health Facilities

Under the operating control of the Bristol Bay Area Health Corporation, the Chignik Health Clinic provides medical treatment for local residents and residents of the other four communities in the Chignik economic area. The facility is operated by a physician's assistant employed by the Bristol Bay Area Health Corporation ("BBAHC," P.O. Box 130, Dillingham, AK 99576). Other than part-time positions paid by the city, the staff, consisting of two or more health aides and a clerk/receptionist, is employed by BBAHC. The present clinic was built in 1988 and is

owned by the city. The U.S. Public Health Service oversees the facility and pays rent to the city. Persons needing further medical care are taken to hospitals in Dillingham, Kodiak, or Anchorage.

1.5 Education

By law, the Lake and Peninsula Borough, via its s the Lake & Peninsula School District (P.O. Box 498, King Salmon, Alas responsible for public education of borough residents. There are no non- ion alternatives in a 200-mile radius. A new school was built in 1994. ginning of the 1994-95 school year, the new school was open for kind gh 12th grade students. It consists of six classrooms, kitchen, s ublic assembly room, and offices. The gymnasium was completed in 19 ool has a staff of three teachers, a preschool teacher, a secretary, a cook, enance person. In the beginning of the 1994-95 school year, there were n grades K-8 and 7 students in grades 9-12.

1.6 Electricity

The city owns and operates two systems that supply electricity to residences, community facilities, and businesses (other than the two fish processing plants) in Chignik. The main power plant has three diesel-powered generators with a combined generating capacity of 525 kilowatts (kW). The city built a new power house for a smaller system. Two generators are interconnected, one of which can produce 35 kW and the other 75 kW.

The city is working independently, with the Lake & Peninsula Borough, and with Aleutian Dragon Fisheries (ADF) to obtain a hydroelectric plant with a production capacity of 1.1 megawatts. Standard texts indicate that Chignik "enjoys" 10-mile-per-hour prevailing winds. Longtime residents consider this a conservative estimate. There is plenty of wind in Chignik. The possibility of using wind-generated electricity is being explored.

1.7 Transportation

Chignik is accessible only by air or boat. Daily flights to Chignik are made throughout most of the year by Peninsula Airways, operating from King Salmon. During the winter the number of flights to all South Alaska Peninsula communities are fewer due to weather and lack of demand. From May through September, Peninsula Airways schedules flights to Chignik from Kodiak.

Aircraft land on the State-owned runway, 2,600 feet by 150 feet long. Recently an automated weather observation and reporting system was installed. This module continuously reports weather information measured by its thermometer, barometer, anemometer, etc., to nearby aircraft.

Because it is situated on a deep, sheltered bay, the city of Chignik is the area center for ocean transportation. Passengers enter and exit Chignik via the Alaska Marine Highway System ferry. The city is attempting to build a dock to provide a better facility for serving ferry traffic and other waterborne local commerce. Freight arrives most frequently via the Coastal Transportation fleet that serves the city and thereby the other four communities of the area. Service is weekly from March through October and biweekly in winter. Other ocean carriers, *e.g.*, Sea-Land and Western Pioneer, serve the community on an on-call basis.

1.8 Fuel

Diesel fuel is purchased from Harbor Enterprises (via its Petro Marine Services subsidiary) and Delta Western. Over the past 3 years, the average price per gallon of diesel has been $0.90. Fuel for the city generators, facilities, and equipment is pumped through a line traversing the ADF property and public rights-of-way to the city tank farm.

Each of the two fish processing plants has storage tanks. The capacity of the 10 tanks at the ADF plant is 176,000 gallons. The capacity of the three tanks at Chignik Pride is 60,000 gallons. ADF is the primary fuel supplier to the year-round residents. The retail price of fuel is about $1.20 per gallon.

1.9 Housing Conditions

There were 30 private homes in Chignik in 1970 and 86 in 1994. All units have plumbing and kitchens, and 62 percent have telephone service. Eighty-six percent of these houses were built between 1980 and 1990.

Housing for transient seafood processing workers is provided in bunkhouses owned and operated by the two shore-based processors. The two companies report that each can house and feed about 300 workers.

Since the community incorporated as a second class city in 1983, it has received title to its townsite lands. Some of this land was used for residences. By the end of 1995, the city and the local (for-profit) village Native corporation, Far West Corporation, will have begun the transfer of about 1,100 acres to the city. About 250 of these acres are designated for residences. The Department of Housing and Urban Development (HUD) has helped build 15 residences in the city via its Mutual Help Housing Program. The local HUD contractor, Bristol Bay Area Housing Authority, plans about five more homes in Chignik. They are scheduled for construction in Federal fiscal year 1997.

2. ECONOMIC BASE

2.1 Demographic Data

The State of Alaska Department of Community and Regional Affairs (ADCRA) has determined that the year-round resident population in Chignik in 1994 was 191. The population in the first official census in 1890 was 193. During the intervening years the population has fluctuated considerably, reaching a reported low of 83 in 1970 and a peak of 253 in 1950.

Most of this fluctuation can be attributed to the state of the local economy. Since Chignik has historically depended on the fishing industry for jobs and income, downward price trends in salmon and crab harvests result in a downward trend in resident population. As the opportunity for local work diminishes, job seekers become attracted to other communities where employment prospects appear more favorable. Table B-1 indicates historical population changes in Chignik from 1890 to 1990, as reported by the U.S. Bureau of the Census.

TABLE B-1.--*Population of Chignik, Alaska: 1890-1994*

Year	Population
1890	193
1939	224[a]
1950	253[a]
1960	99
1970	83
1980	178
1990	188
1994	191[b]

[a] Includes the population of Chignik Lagoon and Chignik Lake.
[b] Source: Alaska Department of Community & Regional Affairs.

From 1980 to 1990 there were substantial improvements in the local fishing industry, particularly in the latter half of the decade. Both catch levels and dollar values of the salmon harvest were at record levels. As a consequence, there was considerable

in-migration. Most immigrants were former residents or were related to local residents.

In addition to the year-round resident population, each summer the community receives a large influx of fish tenders, seafood processing workers, salmon fishermen, and crewmembers on floating processors operating in Anchorage Bay. This influx of people generally begins in late May and early June and extends through September. The transient population peaks in late June and July.

At the height of the 1994 salmon season, 300 employees were residing in bunkhouses owned and operated by the two onshore seafood processing plants. About 125 fishing vessels were in the area at beginning of the season; 106 were salmon fishing boats. The total number of crewmembers aboard these vessels was between 500 and 600. Approximately 125 crewmembers were local residents; most of the rest were extended family or others with roots in the area.

Resident fishermen, local fishermen, transient seafood processing workers, and support workers (*e.g.*, mechanics) cause the local population to swell to nearly 2,000. In addition to the tender and fishing vessels working in the area, a few floating processors operate in or close to Anchorage Bay. The number of crewmembers working on a processing ship generally varies depending on vessel size. A small, 150-foot-class processor will carry from 30 to 40 persons, while a larger 300-foot ship may have a crew of more than 100. Although these crewmembers typically remain aboard the processing vessels while in the area, during slack periods they come into the city for personal supplies, recreation, etc.

2.2 Employment

Because Chignik is situated in a relatively rich salmon area, job opportunities are plentiful for residents during the June-through-September salmon season. There are very few positions available during the off-season. During the fishing season, virtually every Chignik resident willing to work is involved in fishing or ancillary activities.

Most residents are involved in the fish harvesting aspect of the industry. The shore-based and floating seafood processing facilities are staffed by transient workers. About 70 percent of those having salmon limited entry permits own a residence in the communities of the Chignik Economic Zone. Other zone residents generally sign on as crewmembers. At the end of salmon fishing season, some residents are able to find temporary work on local construction projects. Most do not work until the next season. They spend the off-season in other communities.

Relatively few jobs not directly related to the fishing industry are available in the community. The Lake and Peninsula School District employs the bulk of these workers, five full-time and four part-time. Other positions are available with the health clinic, retail stores, and city, State, and Federal governments. The two shore-

based seafood processing facilities in Chignik are the dominant employers in the area, maintaining processing crews during the salmon season. Table B-2 indicates local employment by industry in Chignik.

TABLE B-2.--*Resident employment in Chignik, Alaska, 1994*

Industry	Full-time	Part-time/ seasonal	Total
Manufacturing			
ADF, Inc.		130	130
Chignik Pride		125	125
Inlet Salmon		90	90
Trade			
Wholesale		1.5	1.5
Retail	4	9.5	13.5
Services			
Education	7		7
Government	8		8
Health	5		5
Social	2		2
Construction		16	16
TOTAL	**26**	**372**	**398**

Source: City of Chignik.

To secure a reasonable portion of the salmon harvest for processing and to ensure effective use of processing crews, the processing companies have a number of catcher vessels under contract for their annual salmon harvests. Currently the two local processing plants enjoy a substantial advantage over floating processors. Floating processors do not offer haul-out, storage, and repair services. Relative to the shore-based processors, floating processors have limited capacity to handle freight and food orders. Because they are inherently transient, floating processors limit credit very tightly.

The availability of services and credit has kept the local fleet close to the shore-based processors. The shore-based processors have taken advantage of this oligopoly. For

example, Chignik sockeye salmon are demonstrably the best sockeye in the world. However, for the past 2 years Chignik fishermen have received lower prices for their sockeye than fishermen in other areas harvesting inferior salmon.

According to the U.S. Census Bureau's "Social and Financial Characteristics of American Indian, Eskimo, or Aleut Households: 1990," the median Alaska Native householder in Chignik made $31,250 (in 1990). The median income for homeowners was $31,750, and the median income for the two renting households was $18,750.

2.3 Nonrenewable Resources

Metallic mineral potential in the region is not well established. Bituminous and lignite coal beds have been identified on the west shore of Chignik Bay. The deposits are closely spaced and up to 7 feet thick. This coal was mined from 1899 to 1915. However, transportation, access, and world market conditions make current development of this deposit economically infeasible.

There is some promise in extracting natural gas from the coal beds of the region. Polarconsult, an engineering firm specializing in natural resources, is studying the abundance of the resource and the technology for extracting it. The coal reserves in the State of Alaska approximate the coal reserves of the rest of the United States. According to U.S. Geological Survey data, the region has some lode and placer deposits of gold, silver, copper, lead, zinc, molybdenum, and arsenic.

It is probable that during the life of the harbor, extractive and refining operations (due to the abundance of coal) will occur in the area. Cheap energy near deep water can give the city of Chignik absolute and comparative advantages that can further area economic development. Further economic development implies expanded transportation demand that will help support ancillary services for vessels using the harbor. Most of these services will be performed at or in conjunction with the harbor.

2.4 Commercial Fisheries

The fishing industry is the major component in the Chignik area economy. It provides most of the employment for the residents. Also, by means of subsistence fishing, area fisheries provide a substantial portion of the local diet.

Although salmon is by far the dominant species taken in the area, residents harvest other finfish, *e.g.*, halibut, sablefish (blackcod), herring, and cod. The area follows statewide trends in that king, tanner, and Dungeness crab, shrimp, and scallops are harvested and processed when local stocks are available and when the resource agencies (the Alaska Department of Fish and Game [ADF&G], the National Marine Fisheries Service, and the North Pacific Halibut Commission) are able and willing to manage the resources.

2.4.1 Salmon. With slightly more than 100 permits available for salmon harvesting in the Chignik area, entry by new persons is extremely difficult. Persons seeking access into this fishery may do so only by inheriting a permit or purchasing one from an existing holder. Chignik city officials indicate that seine permits for the Chignik area have an average market value of $225,000.

Before June, the ADF&G puts a counting weir into the Chignik River. Escapement (the number of salmon permitted to escape the nets of fishermen) is determined by counting fish at the weir. ADF&G biologists at the weir correlate fish counts with catch data, historical patterns, etc., to open and close fishing periods. By declaring open and closed fishing periods, total catch is controlled.

In 1973, voters limited entry into commercial salmon fisheries in State waters. In 1976, 77 persons were permitted to harvest salmon commercially at Chignik. Since then, the number of persons permitted to do so has grown to 106. For the past 5 years, the local salmon fishery has had an average of 101 participants per year.

During the 1994 season, 105 vessels participated in the Chignik salmon fishery. More than 70 percent of those vessels were in the 30- to 45-foot range. Approximately 19 percent of the vessels are 30 to 35 feet long, 32 percent are in the 36- to 40-foot class, 19 percent are in the 41- to 45-foot group, and 27 percent are in the 46- to 50-foot range. Very few boats are longer than 52 feet. By State statute, seiners fishing in Alaska are limited to a maximum length of 58 feet.

Data also shows that vessels of the Chignik fleet have an average 15-year life span. Over 50 percent of the fleet was built from 1976 to 1980. The survey of local fishermen shows that the new vessels of this fishery are larger than those being replaced and have at least twice the power.

The salmon fishery in the Chignik area typically begins in early to mid-June and extends through September. Small numbers of chinook (king) salmon are taken early in the season. The major fishing effort begins with the sockeye (red) salmon runs, followed by pink, chum, and coho (silver) runs. As are virtually all commercial salmon fishery areas in Alaska, the Chignik district is closely monitored by the ADF&G.

According to the ADF&G, the initial open period for the 1993 season lasted 14 days, June 7-21. Eleven days were open for commercial fishing in July, with another 16 days in August and 13 days in September. Of the 1984 salmon fishing season of approximately 120 days, only 57 days were available for fishing. In 1994, approximately 50 days were available for fishing.

Published salmon catch statistics released annually by ADF&G show that in the 15 seasons beginning in 1979, total fish landings ranged from a low of 1.2 million in

1985 to a high of 4.4 million in 1988. The average from 1984 to 1993 is more than 2.8 million fish. Table B-3 shows these statistics.

TABLE B-3.--*Total salmon catch by number of fish and value, Chignik Area, Alaska, 1983-93*

Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Value ($)
83	5,488	1,824,175	61,927	321,178	159,412	2,372,180	11,705,781
84	4,318	2,660,619	110,128	444,804	63,303	3,283,172	21,753,490
85	1,888	922,151	191,188	160,128	22,806	1,298,161	9,735,490
86	3,037	1,645,834	116,633	647,125	176,640	2,589,269	18,447,523
87	2,651	1,898,838	150,414	246,775	127,261	2,425,939	26,500,588
88	7,296	795,841	370,420	2,997,159	267,775	4,437,832	27,751,077
89	3,542	1,156,782	68,233	27,691	1,587	1,257,823	13,601,008
90	9,901	2,093,650	130,131	550,008	27,004	3,053,694	24,776,691
91	3,157	1,895,665	165,625	1,169,248	261,096	3,494,791	12,609,213
92	10,832	1,277,449	310,943	1,554,073	222,134	3,375,431	15,294,345
93	19,515	1,697,351	229,459	1,648	122,360	3,717,062	9,938,096

Source: Alaska Department of Fish and Game.

A big jump in salmon ex-vessel value between the 1976 and 1977 seasons, from $5 million to $15 million, is attributed to biological changes as well as to the enactment of the Magnuson Fishery Conservation Act of 1976. By this act, the U.S. Government assumed the conservation and exclusive management of all fishery resources within 200 miles of shore. The effect of the Magnuson Act was the elimination of almost all foreign vessels from this fishing zone, termed the EEZ, the exclusive enterprise zone. This restriction allowed U.S. fishermen access to salmon runs without competition from foreign vessels.

2.4.2 Shellfish. In the Chignik Area, the shellfish biomass has historically consisted of Dungeness crab, shrimp, king crab, tanner crab, and scallops. King crab and shrimp have not been harvested commercially since 1982, and tanner crab has not been harvested since 1989. Dungeness crab and scallops have been harvested to a limited extent.

The king crab fishery has been closed since the 1983-84 season. In 1993 the ADF&G used trawl gear to assess the crab population. It was determined that the king crab

stocks in the Chignik area continued to be depressed. Therefore, no commercial fishing is anticipated in the near future.

Five vessels registered in the area for brown king crab harvest in 1983; no catch was recorded. No vessels registered to fish for brown king crab during 1993. The stock status is unknown at the moment. Some data indicate that commercial quantities have been located.

Tanner crab fishing in Chignik has been closed since 1990 due to the low abundance. The Alaska Board of Fisheries has adopted pot limits for the Chignik district. The limit is 40 pots when the harvest guideline is less than 600,000 pounds and 75 pots when the harvest guideline is greater. Population estimates from trawl surveys in the Chignik district show a decline in legal crab populations from 1989 to 1992. The 1993 survey showed an increase of legal-sized male tanner crabs from 1992 population estimates. The population still remains well below the levels of the 1980's. According to ADF&G data, pre-recruit crab abundance appears weak. The department expects no significant increase in the number of any of the four species of commercially caught crabs in the near future.

During 1992, ADF&G conducted shrimp trawl surveys to determine the stock status in the Chignik area. The Chignik Bay population estimate was 2 million pounds. A minimum of 4.55 million pounds biomass is needed to warrant a commercial fishery in Chignik. According to ADF&G, the shrimp population appears to be rebuilding in the area. During the 1993-94 season, no inshore shrimp sections were open in the Chignik district. From the offshore section, which was open to shrimp fishing, no vessels registered or delivered.

The Dungeness crab harvest has been sporadic and low due to low prices. In 1993, ADF&G recorded abnormally high catches of small Dungeness crab during the summer trawl survey in the Chignik area.

Scallop fishing effort in the Chignik area has been sporadic, with few vessels participating. ADF&G does no assessment of the stock abundance in the Chignik area. The 1993 fishery showed there may be scallop populations available for commercial harvest. Table B-4 summarizes shellfish and octopus data. Some data are confidential because of the limited number of participants.

2.4.3 Bottomfish. Bottomfish are defined in this section as being of two types: groundfish and flatfish. As with the previous category, data on local populations and catches are not as specific as those for salmon. ADF&G data support the statement that significant numbers of these fish are in the area. The data also supports the conclusion that these fish are not being harvested. Thus, harvesting will affect the National Economic Development (NED) benefits positively. Although "bottomfish" and "groundfish" tend to be catchall terms for fish other than herring,

salmon, and shellfish, this section will distinguish between these species. In this section, bottomfish include halibut, cod, and other species.

TABLE B-4.--*Shellfish and octopus harvest, Chignik Area, Alaska (lb), 1984-94*

Year	King	Tanner	Dungeness	Shrimp	Octopus	Sea cucumber
1984	Closed	659,043	647,497	0	-	-
1985	Closed	385,838	462,258	0	Conf.	-
1986	Closed	184,907	179,367	0	-	-
1987	Closed	195,060	182,706	0	-	-
1988	Closed	183,111	179,022	0	43,332	-
1989	Closed	323,120	Conf.	0	14,890	-
1990	Closed	Closed	65,806	0	11,504	-
1991	Closed	Closed	80,248	0	21,812	-
1992	Closed	Closed	Conf.	0	61,943	-
1993	Closed	Closed	273,811	0	24,417	93,701
1994	Closed	Closed	277,639	0	78,790	413,576

Source: ADF&G.

Halibut. This fishery has undergone profound regulatory changes in recent years. Individual Fishing Quotas (IFQ's) were implemented in Alaska on March 15, 1995, for the halibut and sablefish (blackcod) fisheries. Quota shares are rights to a percentage of the harvest. The International Pacific Halibut Commission sets the annual harvest. Each year's harvest level, and an individual's quota share, determines the IFQ - the number of pounds a quota holder can take in a given year. Halibut quota shares are issued for fishing in specific management areas and for specific vessel sizes. Those receiving shares are able to sell or lease them within the same management area and for use on boats in the same size category.

Close to 85 percent of the world's supply of Pacific halibut comes from the waters off Alaska. Fishermen in the Lake and Peninsula Borough, of which Chignik is a part, hold 192 IFQ's.

Cod. The local cod fishery is undergoing substantial changes. Intense and continuous pressure is being put on the State legislature, Congress, the North Pacific Fisheries Management Council, and other Government agencies to make a local cod fishery. By the end of 1996, cod will be second to salmon in economic importance. The possibility of a fishery developing at Chignik appears to have increased in the past year due to the increase in available biomass in the area, as well as to the willingness of ADF&G to manage the local non-salmon species. Table B-5 lists the allocations and catches of Pacific cod in the Gulf of Alaska from 1987 through 1994, with a projection for 1995.

TABLE B-5.--*Final allocations and catches of Pacific cod, Gulf of Alaska, 1987-94*

Year	Allowable catch	Actual catch (metric tons)
1987	125,000	32,939
1988	99,000	33,802
1989	71,200	43,293
1990	90,000	72,517
1991	77,900	76,977
1992	63,500	80,100
1993	56,700	56,487
1994	50,400	45,603
1995 (projected)	108,000	

Source: North Pacific Fishery Management Council, 1994.

Pollock. After the joint-venture fisheries of the mid-1980's, pollock is thought of as a Bering Sea species. Nevertheless, a large biomass is concentrated in the Shelikof Strait or regularly traverses it. Since most of the Shelikof Strait lies within the Chignik salmon fishing area, local fishermen have expressed interest in harvesting this species.

The pollock fishery, however, requires larger boats than those currently operating out of Chignik. If the fleet upgrades to larger vessels in the future, it may be able to take better advantage of this fishery.

Other Bottomfish. The valuable sablefish (blackcod) is managed under an IFQ plan. Alaska supplies about three-fourths of the U.S. sablefish catch and more than half the world catch. Other flatfish species include rock sole and starry flounder, labeled "flatfish" in table B-6. This table summarizes bottomfish catches in the Chignik area for 1984 through 1994.

TABLE B-6.--*Bottomfish harvest, Chignik Area, Alaska, 1984-94*

Year	Halibut[a] (000 lb)	Cod[b] (mt)	Blackcod (mt)	Flatfish[c] (mt)
1984	6,503	5,844	3,436	400
1985	10,888	3,224	4,104	500
1986	5,547	4,092	8,011	1,500
1987	7,700	2,378	10,814	2,700
1988	7,082	2,451	[c] 31,000	7,000
1989	7,843	3,072	[c] 29,800	5,200
1990	8,752	8,248	[c] 27,300	15,400
1991	11,934	13,755	[c] 24,400	34,100
1992	8,620	14,613	[c] 21,600	43,600
1993	7,855	8,215	37,853	39,500
1994	9,950 (preliminary)	8,806	38,363	37,900 (preliminary)

[a] Area 3B data is from table 1 of appendix A of the *Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska as Projected for 1995,* compiled by the North Pacific Fishery Management Council Plan Team for the Groundfish Fisheries of the Gulf of Alaska, November 1994. The quantities are in thousands of pounds.

[b] The quantity landed in the International North Pacific Fisheries Committee (INPFC) Chirikof Statistical Area. Source: *Summary of Major Changes in the Pacific Cod Assessment* by Grant G. Thompson and Harold H. Zenger.

[c] National Oceanic and Atmospheric Administration Fisheries Science Center's domestic figures (round weight) for the Gulf of Alaska, obtained from *Economic Status of the Groundfish Fisheries of Alaska, 1994.*

Note: mt = metric tons.

Herring. Herring in and around Chignik are of minor economic importance. However, many Chignik boats fish herring in the Togiak fishery, the richest herring fishery in the world. Because the bays around Togiak are shallow, the shallow-draft Chignik boats are well suited to this fishery.

An average of 20 vessels fish for herring in the Togiak area, according to local sources. Table B-7 shows total herring harvests for the Togiak area from 1984 through 1994.

TABLE B-7.--*Herring harvest, Togiak Area, Alaska, 1984-94*

Year	Spawn-on-kelp harvest	Inshore catch
1984	406,587	19,300
1985	No fish	25,616
1986	374,142	16,260
1987	307,307	15,204
1988	489,320	14,382
1989	559,780	12,258
1990	413,844	12,253
1991	348,357	14,970
1992	363,600	25,808
1993	383,000	17,925
1994	308,400	30,316

2.5 Fishing Fleet Operations

2.5.1 Salmon Fleet.

General. Catcher vessels operating in the Chignik area for the salmon season begin arriving in late May or early June, with the first open fishing period usually beginning the first or second week of June. The first runs are sockeye salmon, followed by successive runs of pink, chum, and coho salmon. The season is generally concluded at the end of September. The entire season is closely monitored and regulated by the ADF&G. Open and closed fishing periods are set by ADF&G, based primarily on pre-established escapement quotas.

Depending on expected catch levels, some salmon seiners in the area fish herring in April and May prior to the salmon season. The herring fishery, however, is incidental to the predominant salmon harvest.

The seine vessels used during the season are typically operated by a skipper and three or four crew members. ADF&G states that for the early peak runs, most of the fishing effort is concentrated in the Chignik Lagoon area, a short distance from

Anchorage Bay. As the season progresses, vessels tend to travel farther away from Chignik. An average of 101 seine vessels usually fish in the Chignik area.

Seine vessels deliver their product to tenders, which are under contract to either the local shore-based processing facilities or one of the floating processors operating from Anchorage Bay. They are primarily crab vessels that assist in the salmon harvest during the off-season. Approximately 20 tenders operate during the salmon season.

During closed fishing periods, approximately 60 vessels moor against the Aleutian Dragon Fisheries (ADF) dock, and another 30 boats moor at Chignik Pride. Vessels are usually rafted six to seven deep. The remaining vessels stay on moorings in Chignik Lagoon or Anchorage Bay.

Because the vessels are so heavily stacked against each other and the docks, virtually all incur damages caused by natural wave action. Damages occur as a result of vessels banging into pilings and other vessels. The dock itself incurs significant damage because of excessive use. Managers of both fish processing plants report that an average of 11 fender pilings must be replaced annually due to damages received from the vessels, at an average repair cost of $6,000 per piling.

During storms and rough seas, when there is excessive wave action against the dock that causes vessel damage, boat operators must navigate away from the docks to an area that offers some protection. They generally seek shelter in the northeast corner of Anchorage Bay, which offers partial protection because of a natural spit. The vessels attempt to lay anchor as securely as possible. However, the bottom is soft, and during storm conditions vessels frequently drag their anchors. Thus the vessels must maintain steerage by operating the vessel. An average of 18 days per season are spent seeking shelter from rough seas behind the spit.

In 1979, a 42-foot seiner was unable to move away from the dock in time to avoid the continuous excessive wave action against the dock during a storm and was swamped. In 1985, three vessels were grounded when high winds and strong waves broke their anchor lines and allowed the boats to drift. In 1994, six vessels in Chignik Lagoon were blown onto the beach, with total estimated damages of $120,000. Another vessel valued at $230,000 was blown ashore in Anchorage Bay and was declared a total loss.

The average salmon season in the Chignik area lasts 120 days. Roughly 45 of these days are actually spent fishing, with the remainder attributed to closed fishing periods or severe storms. When the salmon season ends, the fishing vessels are dry- or wet-stored in Chignik or other nearby communities until the next season.

Vessel Operating Costs. In calculating the actual daily cost of operating and maintaining these vessels, the individual cost items were classified into three groups: fixed, variable, and direct operating. 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. Depreciation is based on the average value of seiners in the Chignik fleet, $273,000. Return on investment is a 4.4-percent return on the full value of the assets (vessel and gear). This is conservative in light of the long-term rates and does not account for the value of the fishing permit, which has a market value of $225,000. Variable costs for this exercise are those that occur while the vessel is in operation. Such operating costs would include vessel repair and replacement, insurance, maintenance, food, and miscellaneous. The average daily variable cost would be calculated by spreading the total of these identified variable costs over the total number of operating days. In the example of the 42-foot seiner, the total identified variable costs were spread over the 120-day season to derive the average daily cost. Direct operating costs are those incurred in running the vessel engine. These costs include only the cost of fuel and lubricating oil. The oil cost is estimated at 7 percent of the total fuel cost.

The operating cost profile for a typical 46-foot salmon seiner in the Chignik area is shown in table B-8. Information was obtained from Chignik fishermen, the Chignik city manager, and the State of Alaska's Division of Commercial Fisheries. This profile summarizes activities throughout the year. Average daily costs were calculated by spreading the total costs over the number of operating days.

TABLE B-8.--*Daily and hourly vessel operating costs for a Chignik salmon seiner*

Fixed (365 days)		Variable (120 days)		Direct operating	
Item	**Cost**	**Item**	**Cost**	**Item**	**Cost**
Depreciation	$19,650	Gear repair	$9,200	Fuel	$37,800
Return on invest.	13,300	Maintenance	7,080	Lube oil	2,646
		Stores	9,600		
		Moorage	900		
		Insurance	6,830		
		Miscellaneous	2,730		
TOTALS	$32,950		$36,340		$40,446
Daily costs	$90.27		$302.83		$337.05
Hourly costs	$3.76		$12.62		$14.04

2.5.2 Crab and Tender Fleet. Although the three major crab species of king, tanner, and Dungeness have all been harvested in the Chignik area, only the tanner crab fleet has had a significant number of participants. There has been no tanner harvest in the area since 1989. Since the end of the 1982 season, the area has been closed to king crab fishing due to depleted stocks. The Dungeness crab fleet typically contains fewer than 10 vessels.

The only crab fishery in the area which has remained active in the past 10 years has been the Dungeness fishery. From 1985 to 1993 an average of four vessels per year have been involved in this fishery. These vessels range in length from 40 to 250 feet. The average vessel size is 125 feet. The peak effort in this fishery tends to vary and is of limited duration. Most harvesting activity occurs in the early spring, with some effort in October and November.

The king crab fishery in the Chignik area is not expected to change significantly in the near future, remaining closed for at least the next 2 years. Dungeness crab stocks are currently fairly weak and are unable to support the operations of additional vessels. Due to overharvesting and other biological factors, the tanner crab stocks have also declined, and the number of legal-sized crab in the near future is expected to remain relatively low. It is reasonable to assume, however, that this fishery is on the low end of a natural downward cycle. The long-term harvest expectation would likely resemble historical average catches and effort levels. The region has historically provided roughly 3.6 million pounds of tanner crab per year, with an average of 31 vessels.

Vessels engaging in the tanner crab fishery are typical of boats that serve as tenders. Like salmon seiners, they also experience difficulties and inconvenience when operating out of Chignik. Mooring at the Aleutian Dragon Fisheries or Chignik Pride docks subjects the vessels to damages and requires crew on board to move away from the dock.

The average operating cost of tender and crab boats is significantly greater than for the relatively smaller salmon boats. A 105-foot crabber/trawler vessel, typical of boats operating in the Bering Sea, was selected to illustrate the operating costs of similar boats operating in the Chignik area. Table B-9 lists daily and hourly operating costs for these vessels, derived by dividing costs into fixed, variable, and direct operating categories as was done for the salmon seiners.

TABLE B-9.--*Daily and hourly vessel operating costs for a Chignik crabber-tender*

Category	Cost	Days	Daily cost	Hourly cost
Fixed	$337,755	365	$925.36	$38.56
Variable	248,745	285	872.79	$36.37
Direct	146,400	285	513.68	$21.40
TOTAL			$2,311.83	$96.33

2.6 Operations in Adverse Weather

The absence of protected harbor facilities in Chignik makes for a relatively inefficient harvesting operation for both salmon seiners and fish tenders working in the area. Most of these vessels typically return to port during every closed fishing period, awaiting official announcement of the next open period. Information provided by the Aleutian Dragon Fisheries plant manager in Chignik and local fishermen indicates that during closed periods an average of 60 boats moor at the ADF dock, rafted as many as seven deep, and another 30 vessels use dock facilities owned by Chignik Pride. The remaining seiner and tender vessels drop anchor in Anchorage Bay or Chignik Lagoon.

The exposed location of the two unprotected docks at the fish processing plants makes them very susceptible to strong winds and rough seas, leaving the vessels in an extremely vulnerable position. Marine insurance companies require that at least one person capable of moving the vessel be on board at all times when moored at these docks. When the area begins to experience rough seas or excessive wave action, vessel operators must take their boats away from the dock and seek some protection behind a natural spit situated in the northeast corner of Anchorage Bay. Chignik fishermen and ADF&G personnel say severe storm conditions require vessels to seek shelter behind the spit on an average of 18 days per season.

During adverse weather, vessels must first navigate from the docks to the area partially protected by the spit. The boats then drop anchor and attempt to remain in place until the storm subsides. If a seiner is securely anchored to the bottom, the vessel may have to operate its engine for only 1 to 2 hours per 24-hour period, running the engines to recharge the batteries and make steerage adjustments. If, as frequently occurs, the vessel is unable to anchor securely to the bottom and begins drifting, the vessel operator must maintain engine operation continuously to hold position. Seiner operators relate that on average they run their engines for 4 hours every 24 hours. The typical 42-foot salmon seiner incurs direct and variable (less insurance and moorage expenses which remain constant) operating costs of $17.79 per

hour during engine running time. These costs were computed in the following manner.

Operating costs per hour for storm avoidance include direct costs plus a percentage of variable costs. Insurance, gear repair, miscellaneous costs, and moorage fees have been excluded from this calculation, since they would not be avoided if the vessel did not have to seek refuge from storms. However, stores, consisting mainly of foodstuffs, are consumed by crewmembers while on board and remain part of costs. A percentage of maintenance costs are also applicable, since seiners run their engines an average of 4 hours out of every 24 during storms, or one-sixth of each day. One-sixth of $7,080 equals $1,180. Annual direct and variable operating costs for seiners during storms, then, are as follows:

Maintenance	$1,180
Stores	9,600
Subtotal	$10,780
Add direct operating costs	40,446
Total annual operating costs	$51,226
Total daily operating costs (annual/120)	$426.88
Total hourly operating costs (daily/24)	$17.79

While the vessel is anchored in the bay without the use of engines, the total hourly cost (variable only) is $3.75.

In contrast to seiners, tender vessels must keep engines operating throughout the storm, both to maintain position and to operate the vessel's electrical systems. Tenders operating during the salmon season are typical of the crabber vessels that work in the area during the crab season. The average hourly variable (less insurance and moorage) and direct operating cost for tenders is $38.10. The computation of this cost is discussed below.

As with seiners, gear repair, miscellaneous expenses, insurance, and moorage fees are not considered when computing hourly costs for tenders. Stores remain, and 100 percent of maintenance is considered because tenders run their engines at all times during storm avoidance. The annual variable and direct operating costs for tenders during storms are as follows:

Maintenance	$48,505
Stores	65,669
Subtotal	$114,174
Add direct operating costs	146,400
Total annual operating costs	$260,574
Total daily operating costs (annual/285)	$914.30
Total hourly operating costs (daily/24)	$38.10

3. WITHOUT-PROJECT CONDITIONS

If no harbor facility is constructed at Chignik, conditions for commercial and subsistence fishers will likely remain the same, and with time, worsen. According to the ADF&G, the forecast for the Chignik area is positive; fish and shellfish stocks are projected to remain steady.

The absence of protected harbor facilities in Chignik will continue to make for inefficient harvesting operations for all types of fishing.

4. PROJECT BENEFITS

4.1 General

This section is intended to provide an analysis of the potential economic benefits that would be realized with the harbor under consideration in the study. 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 during public meetings, site visits to Chignik, followup telephone conversations, and by review of statistics from the resource and fisheries management agencies. 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 rate. The interest rate used in this analysis is 7-3/4 percent, and a 50-year project life is assumed. Estimated costs and benefits have been made to reflect January 1995 price levels.

4.2 Operating and Opportunity Cost Savings During Storms

4.2.1 Fishing Season. Crew members incur an opportunity cost of time (OCT) associated with storm conditions. OCT is the value of work or leisure activities forgone by having to run and anchor during storms. No direct wage loss occurs because crew members are paid based on a percentage of revenues from the harvest. The opportunity cost premise is based on the concept that the more time a boat's crew is required to spend away from town eluding weather, the more valuable protected moorage becomes.

Chignik fishermen relate that during adverse weather that coincides with closed fishing periods, skippers and crew members are unable to mend nets, perform maintenance, take part in community activities, or obtain fuel, water, and stores. Because the spit is only semiprotected and away from the community, it is impossible to perform these activities while waiting out storms. Operating costs measure the direct out-of-pocket expenses associated with storm avoidance, while the opportunity cost measures the time forgone by a vessel's crew during storm periods. By not including a value for opportunity cost, benefits would be understated.

For OCT calculations, a value of next best use of time has been assigned. For the purpose of this report, the OCT has been assigned a minimum, or leisure time, value. According to Engineering Regulation (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. The Alaska Department of Labor has determined the median Alaska hourly wage rate for fishermen to be $14.00 (*Alaska Economic Trends*, June 1994). One-third of this average hourly wage equals $4.67. This figure will be used in opportunity cost of time calculations.

An average of 90 vessels tie up to the two fish processing docks in Chignik, roughly 75 salmon seiners and 15 tenders. The remaining 26 seiners and 5 tenders must drop anchor in either Chignik Lagoon or Anchorage Bay. Total annual savings associated with improved harbor conditions for salmon and tender vessel operators avoiding storms was calculated by multiplying the number of boats by the number of storm days, average engine running time, and operating cost per hour. Operating costs per hour for storm avoidance include direct costs plus a percentage of variable costs. Insurance and moorage fees were excluded from this calculation, since these costs would not be avoided. Opportunity cost of time benefits were found by multiplying days spent avoiding storms, average number of crew on board, time on board less 8 hours for sleep, and OCT per hour.

Salmon seiners

101 vessels x 18 days (d) x 4 hours (h) x $17.79 cost/h	=	$129,400
101 vessels x 18 d x 16 h x $4.67 OCT x 2 crew	=	$271,700
Total	=	$401,100

Tender vessels

20 vessels x 18 d x 24 h x $38.10 cost/h	=	$329,200
20 vessels x 18 d x 16 h x $4.67 OCT x 2 crew	=	$ 53,800
Total	=	$383,000

4.2.2 Winter. Rough seas and storm conditions are even more common during the winter and early spring. Although the majority of salmon boats are either dry-stored in Chignik or seek moorage in other communities, a good number of crab vessels must ride out the winter in the area. According to the ADF plant manager and local fishermen, as many as 20 large vessels each year seek protection behind the spit during periods of rough seas. Typically, however, an average of nine boats yearly go to protected areas near Chignik during storm conditions. Area fishermen indicate that these vessels required protection from adverse weather an average of 30 days during the October-through-May off-season in the past several years. Using the 30 severe weather days per year during the off-season, 9 boats impacted per occasion, and the hourly operating cost of $38.10, the average annual cost is:

9 vessels x 30 d x 24 h x $38.10/h cost	=	$246,900
9 vessels x 30 d x 16 h x $4.67 OCT x 2 crew	=	40,300
Total	=	$287,200

With a protected harbor at Chignik, salmon vessels and larger tender/crabber boats would be securely protected from adverse weather and would realize the savings of the above costs. The total annual operating and opportunity cost savings would be $1,071,300.

4.3 Overcrowding Damage Avoided

4.3.1 Dock Damage. The primary moorage points for vessels operating in the Chignik area are the docking facilities owned and operated by the two fish processors. These are privately owned docks, and though fishermen are currently allowed to tie up to the docks, both processing plants are increasingly discouraging the practice. The cost to the processors of repairing the docks and replacing pilings worn from constant stress is resulting in stricter policies regarding dock tie-ups.

Currently, throughout the salmon season the docks are heavily used by fishermen, often rafted as many as seven vessels deep. This heavy use places considerable strain on the dock, causing significant damages to fender pilings. Plant managers for these processing plants say that an average of 11 pilings require replacement annually due to excess pressures and stress associated with overcrowded conditions. The average replacement cost is $6,000 per piling. With harbor improvements, vessels would no longer be required to rely on area docks as primary moorage points. The overcrowded conditions responsible for dock damages would be eliminated. Assuming 20 percent of dock damages are due to normal use, the annual total damage prevention benefits would be as follows:

11 pilings x $6,000 x 0.80 = $52,800

4.3.2 Vessel Damage. As previously indicated, during the fishing season, roughly 90 vessels tie up to the docks at the two fish processing plants. When vessels are rafted together, the disruption associated with any boat leaving the raft can be substantial. Depending on the raft configuration and the location of the vessel which must break away, the number of boats that have to be moved can be significant. During normal docking procedures, with these extremely overcrowded conditions, vessels are subject to minor collisions from other vessels and bumping against the dock, causing scratches, damages to rails, guards, hardwood, etc. These problems are aggravated whenever there is a significant tidal change or wave action against the dock. In addition, damages are incurred when boats leave the docks to seek protection behind the spit during bad weather. A telephone survey of randomly selected fishermen who regularly use the fish processing docks revealed that approximately 70 percent of the 90 vessels (63 vessels) that tie to the makeshift docks are damaged yearly. Estimates for damages caused by rafting range between $2,000 to $3,000 per vessel. A harbor would reduce the incidence of damage to vessels due to overcrowding by 80 percent, assuming 20 percent of damage is caused by normal wear. Annual benefits for this category would be as follows:

63 boats x $2,500 x 0.80 = $126,000

Total annual benefits for this category equal $178,800.

4.4 Dry Storage Savings

Local fishermen and storage facility operators in and around Chignik indicate that at the end of the fishing season in late September, approximately 30 salmon vessels owned and operated by Chignik residents use dry storage facilities available in the community. Another 20 use dry storage facilities in neighboring communities. The average annual dry storage cost in the area is $625. The fees are set at these levels to cover equipment, labor, and maintenance charges necessary to operate the dry storage facilities. Local fishermen and dry storage operators indicate that if a harbor were available year-round in Chignik, vessel owners would prefer wet storage during the

off-season rather than dry storage. The total annual cost associated with dry storage is allowable as a benefit because the "with-project" cost of wet storage is already accounted for as the operation and maintenance expense of moorage facilities in the harbor. These annual savings in dry storage costs would accrue to the vessel owners:

50 vessels x $625	=	$31,300

4.5 Vessel Delays Avoided

Based on conversations with Chignik fishermen, delays frequently result from the 90 vessels rafting at the processing docks. This situation could be avoided with construction of a harbor at Chignik. Operators who moor at the processing docks estimate that during closures (an average of 55 days per season) approximately 1 vessel in 10 moves from within a raft each day, and each move takes about 1 hour to complete. The vessel desiring to move has its entire crew on board (skipper and three deckhands) and usually operates its engine the entire time, while crews on the surrounding boats (an average of three) untie, push the vessels clear, and retie the raft. Operating costs per hour include variable and direct. Benefits resulting from the elimination of rafting are calculated as:

55 d x 9 moves/d x $17.79/h	=	$8,800
55 d x 9 moves/d x $4.67 OCT x 7 crew	=	16,200
		$25,000

4.6 Subsistence Operations

Subsistence fishing and hunting are vitally important to the economies and cultures of many families and communities in Alaska. State and Federal laws define subsistence as the "customary and traditional" use of wild resources for personal consumption. State and Federal subsistence statutes recognize the importance of customary and traditional subsistence uses of wild resources. Subsistence uses are given preference over commercial fishing in State and Federal law.

Subsistence permits are issued through the ADF&G. Fish, other than rainbow trout and steelhead trout, may be taken at any time, except as may be specified by a subsistence fishing permit. A maximum of 250 salmon per permit may be taken for subsistence purposes per year. Salmon predominates in subsistence catches, accounting for an average of 75 percent of subsistence harvests. The remaining 25 percent is composed of crab, clams, octopus, and other fish.

Surveys of communities in various rural regions in Alaska regarding subsistence were described by the ADF&G in 1994 in a report titled "Subsistence In Alaska: 1994 Update." According to this report, from 75 percent to 98 percent of sampled

households harvested fish for subsistence use. The ADF&G report entitled "1994-95 Subsistence and Personal Use Fisheries in Alaska" states:

> *The Alaska Board of Fisheries finds that salmon and finfish other than salmon, except steelhead and rainbow trout, in the Chignik Area are customarily and traditionally taken and used for subsistence.*

The Chignik area is categorized as rural, with a chronic labor surplus during the majority of the year. Therefore, subsistence benefits were calculated.

As in all economies, certain allowances are made for the effects of trade. Because of availability, taste preferences, and cultural patterns, the subsistence economy is significant. Protein is readily abundant in the Chignik Economic Zone. The rivers and ocean have a number of fish, shellfish, and other flora and fauna that is harvested and eaten by local residents. Data from the ADF&G support the inference that more than half of this quantity of food is supplied by subsistence harvests. Since all of the communities of the Chignik salmon seine fishery are oriented toward the sea by the money economy, the sea provides most of the subsistence foods.

There were 198 salmon subsistence permits issued in Chignik in 1993 and 216 issued in 1994. The average number of salmon caught per permit for both years was 140. The average dressed weight per fish is 7 pounds, and the average price is $4.00 per pound, giving each salmon a retail worth of $28. The annual value of the 1994 subsistence harvest for Chignik would be (216 x 140 x $28) = $46,700.

Currently, subsistence fishers are limited to harvesting in summer only, when limited moorage is available at the town's two fish processing plants. This precludes much of the subsistence catch of crab and bottomfish, along with some salmon that could be taken during the winter months. Without a harbor, Chignik residents are unable to keep vessels in the water throughout the year and must drydock or relocate their boats to other harbors in winter.

ADF&G personnel relate that under existing conditions, access to subsistence resources by water is an ongoing issue in Chignik. The residents' inability to keep boats in the water year-round significantly limits the ability to harvest land and water subsistence resources.

4.6.1 Resources Other Than Salmon. Table B-10 shows the percentage of Chignik households that consume subsistence resources, excluding salmon. Chignik households, like other communities participating in subsistence, trade subsistence goods within their community and neighboring communities to supplement their harvest. Also shown is the percentage of households that actually harvest the resources. The discrepancy between the two is due in large part to the inability of most residents to reach subsistence resources such as crab and caribou, which are

taken in winter. The majority of residents obtain winter subsistence catches by buying or trading with other villages.

TABLE B-10.--*Without-project subsistence harvest, Chignik area (excluding salmon)*

Resource	% households consuming	% households harvesting	Diff.	Pounds consumed	Pounds harvested	Difference (lb)
Crab	93	17	77	11,185	2,002	9,183
Octopus	60	37	23	1,688	1,033	656
Cod	47	33	13	1,071	764	307
Halibut	90	57	33	20,358	12,825	7,532
Caribou	87	17	70	10,279	1,980	8,299
Seal	33	13	20	823	329	494
TOTAL				45,404	18,933	26,471

Subsistence fishing would become more efficient with a harbor in Chignik. The elimination of rafting seven vessels deep, alone, would increase efficiency greatly. A harbor would provide year-round access to vessels and the fishery area and give Chignik residents the opportunity to catch a larger percentage of subsistence resources other than salmon, as well.

Although 100 percent of Chignik households consume subsistence resources other than salmon, ADF&G statistics show that only an average of 29 percent of households succeed in harvesting these resources. The majority of households obtain subsistence catches through either purchasing or trading. Based on telephone surveys with Chignik residents, with a harbor the percentage of households harvesting subsistence resources other than salmon would increase from the current average of 29 percent to 55 percent of all households.

Table B-11 shows probable percentages for subsistence consumption and harvests with a harbor. Estimates were obtained from ADF&G and telephone interviews with Chignik residents.

TABLE B-11.--*With-project subsistence harvest, Chignik area (excluding salmon)*

Resource	% households consuming	% households harvesting	Pounds consumed	Pounds harvested	Difference (lb)
Crab	93	75	11,185	8,948	2,237
Octopus	60	48	1,688	1,350	338
Cod	47	37	1,071	857	214
Halibut	90	72	20,358	16,286	4,072
Caribou	87	69	10,279	8,224	2,056
Seal	33	27	823	658	165
TOTAL			45,404	36,323	9,082

Table B-12 shows the calculation of monetary benefits to Chignik-area subsistence users for the increase in subsistence food harvest that a harbor would bring. Annual benefits of $53,738 were calculated by multiplying the increase in harvest by the least-cost alternative.

TABLE B-12.--*Benefit calculations for increase in non-salmon subsistence harvest, Chignik area*

Resource	Pounds harvested w/o project	Pounds harvested with project	Increase in harvest (lb)	Price/lb of substitute	Benefit ($)
Crab	2,002	8,947	6,947	$3.09	21,466
Octopus	1,033	1,350	317	3.09	980
Cod	764	857	93	3.09	287
Halibut	12,825	16,286	3,461	3.09	10,694
Caribou	1,980	8,224	6,244	3.09	19,294
Seal	329	658	329	3.09	1,017
TOTAL					53,738

4.6.2 Salmon. A random survey of Chignik residents showed that the convenience of a harbor would increase salmon subsistence fishing to approximately 65 percent of the annual limit set by ADF&G, or 163 salmon per permit holder. Currently, subsistence fishers catch approximately 55 percent of the legal limit, or 140

salmon. There were 216 salmon subsistence permits issued in Chignik in 1994. Salmon is valued at $28 per fish, and each permit holder caught an average of 140 fish. Multiplying, 216 x $28 x 140 = $846,700. Increasing the harvest to 163 salmon per permit holder results in a total harvest value of $985,800 (216 x $28 x 163 = $985,800). This results in a net annual benefit of $139,100.

Total subsistence benefits equal $53,738 + $139,100 = $192,800.

4.7 Harbor of Refuge

The NED economic impact of a better harbor of refuge at Chignik would be more days available for vessels to take refuge in the harbor during severe weather. This increase in refuge days would increase leisure time for skippers and crew, reduce vessel operating costs, and reduce the risk of vessel loss or damage at sea. A harbor of refuge would also reduce search and rescue costs for the U.S. Coast Guard and reduce the loss of life associated with vessel accidents.

Damage to vessels and gear would be greatly reduced with a Chignik harbor. A harbor would provide harbor-of-refuge benefits for all types of vessels. Fishing vessel safety is a concern in Alaska and on the West Coast in general. The Pacific States Marine Fisheries Commission, in cooperation with the National Research Council Committee on Fishing Vessel Safety, produced a lengthy report on West Coast vessel safety. The study drew from several data sources, including the NMFS vessel operating units data base, the Pacific Fisheries Information Network data base, U.S. Coast Guard casualty data, Washington Department of Health occupational mortality data, and interviews with fishermen. The study found that heavy weather is a factor in 51 percent of serious vessel casualties in the West Coast fishing fleet and that seeking refuge in a safe harbor is considered to be an effective means of reducing risk at sea. Vessel owners relate that the area has an average of 18 days per season in which severe storm conditions require vessels to seek shelter.

The economic value of a harbor-of-refuge benefit can be compared with that developed for Kodiak Harbor (U.S. Army Corps of Engineers). At Kodiak, it was estimated that each slip, including transient moorage space, provides $5,000 in storm damage benefits annually, based on vessel size and value, proximity of accidents, etc. However, Chignik vessels sustain less damage on an average annual basis than does the Kodiak fleet. Accordingly, the value of the benefit has been reduced. Based on information provided by The U.S. Coast Guard, Chignik area fishermen, and analyses in other Alaska District studies, it is estimated that a harbor at Chignik would provide $4,000 in annual benefits per slip as a harbor of refuge. The alternative selected allows for approximately 8 large transient vessels, providing annual benefits of $32,000.

8 spaces x $4,000 per slip = $32,000

4.8 Employment Benefits

Chignik has a high unemployment rate; therefore, National Economic Development (NED) annual employment benefits of $164,200 can be claimed for this project. The calculation of these benefits is shown in table B-13.

TABLE B-13.–*Employment benefits*

	Item	Amount
1	Construction contract cost	$9,184,000
2	Assigned to labor (50% of item 1)	$4,592,000
3	Skilled (30% of item 2)	$1,377,600
4	Unskilled (40% of item 2)	$1,836,800
5	Other (30% of item 2)	$1,377,600
	Percentage used as benefits:	
6	Skilled (40% of item 3)	$551,000
7	Unskilled (58% of item 4)	$1,065,300
8	Other (35%)	$482,200
	TOTAL	$2,098,500
	Ave. annual equivalent (7.625%, 50 years)	$164,200

4.9 Benefit Summary

Benefits have been quantified for the following categories:

- Operating and opportunity savings during storms;
- Overcrowding damage avoided;
- Dry storage savings;
- Vessel delays avoided;
- Subsistence operations;
- Harbor of refuge; and
- NED employment.

Table B-14 summarizes the benefits by category. The total annual benefit is $1,695,400.

TABLE B-14.--*Summary of benefits*

Item	Annual amount
Operating and opportunity savings during storms	$1,071,300
Overcrowding damage avoided	178,800
Dry storage savings	31,300
Vessel delays avoided	25,000
Subsistence	192,800
Harbor of refuge	32,000
NED employment	164,200
Total annual NED benefits	**$1,695,400**

5. INTEREST DURING CONSTRUCTION

Interest during construction (IDC) is added to the project first cost to account for the opportunity cost incurred during the period after construction funds have been expended but before the benefits begin to accrue. The IDC is calculated by matching the construction expenditure flow with the interest forgone had the funds been deposited in an interest-bearing account. The actual construction schedule is not known at this time; however, the construction period is assumed to be 9 months. For this analysis, it was assumed that there would be 9 level monthly expenditures of $1,153,556. With an annual interest rate of 7.625 percent, the monthly rate is .006345167.

First cost of the recommended plan, including the cost of planning, engineering, and design (PED), is $10,365,000. Interest on the PED cost of $435,000 for 9 months at 7.625 percent is approximately $25,000. This amount is added to the first cost when calculating the IDC. The IDC computed for $10,390,000 is $268,000. The first cost plus the two interest items is equal to $10,658,000. The annual cost for this amount at 7.625 percent for 50 years equals $833,000.

APPENDIX D

REPORT RECIPIENTS AND CORRESPONDENCE

1. REPORT RECIPIENTS

Federal Agencies:

Advisory Council on Historic Preservation
Agriculture Stabilization and Conservation Service, State Director
Alaska Resources Library, Anchorage, Alaska
Bureau of Indian Affairs, Area Director, Juneau, Alaska
Bureau of Land Management, State Director, Anchorage, Alaska
Department of Energy, Division of NEPA Affairs
Department of Health and Human Services, Washington, D.C.
Department of Housing and Urban Development, Environmental Officer/Planner, Anchorage, Alaska
Department of Housing and Urban Development, Regional Environmental Officer
Department of the Interior, Director, Office of Environmental Project Review
Department of State, Office of Environmental Affairs
Department of Transportation, Washington, D.C.
Economic Development Administration, Seattle, Washington
Environmental Protection Agency, Alaska Operations Office (Ms. Heather Dean), Anchorage, Alaska
Environmental Protection Agency, Director, Office of Federal Activities
Environmental Protection Agency, Region X, Seattle, Washington
Federal Aviation Administration, Alaskan Region
Federal Aviation Administration, Alaskan Region, Airports Division
Federal Emergency Management Agency, Region X, Bothell, Washington
Federal Emergency Management Agency, Washington, D.C.
Federal Highway Administration, Region 10, Juneau, Alaska
National Marine Fisheries Service, Anchorage, Alaska
National Marine Fisheries Service, Regional Director, Juneau, Alaska
National Ocean Survey, Silver Springs, Maryland
National Oceanic and Atmospheric Administration, Director, Office of Ecology and Conservation
National Park Service, Anchorage, Alaska
National Weather Service, Director, Alaska Region
Office of Polar Programs, National Science Foundation
The Honorable Don Young, United States House of Representatives
The Honorable Frank Murkowski, United States Senate
The Honorable Ted Stevens, United States Senate
U.S. Army CRREL, Commander/Director, Hanover, New Hampshire
U.S. Army CRREL, Ft. Wainwright, Alaska
U.S. Army Corps of Engineers, Coastal Engineering Research Center, Evaluation Branch, Vicksburg, Mississippi
U.S. Army Corps of Engineers, North Pacific Division, Portland, Oregon

Federal Agencies, Continued:

U.S. Army Corps of Engineers, Office of the Chief of Engineers, Civil Works Programs
U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi
U.S. Coast Guard, Juneau, Alaska
U.S. Fish and Wildlife Service, Anchorage, Alaska
U.S. Fish and Wildlife Service, WAES Field Office, Anchorage, Alaska
U.S. Forest Service, Regional Forester, Juneau, Alaska
U.S. Geological Survey, Water Resources Division, Anchorage, Alaska

State Agencies:

Alaska Marine Highway, Design Chief, Division of Marine Facilities, Juneau
Department of Commerce and Economic Development, Commissioner, Juneau
Department of Commerce and Economic Development, Anchorage
Department of Community and Regional Affairs, Commissioner, Juneau
Department of Community and Regional Affairs, Rural Development Division, Anchorage
Department of Environmental Conservation, Commissioner, Juneau
Department of Environmental Conservation, Anchorage
Department of Fish and Game, Commissioner, Juneau
Department of Fish and Game, Anchorage
Department of Fish and Game, Division of Habitat and Restoration (Mr. Don McKay), Anchorage
Department of Natural Resources, Commissioner, Juneau
Department of Natural Resources, Alaska Coastal Management Plan Liaison (Mr. Larry Bullis), Anchorage
Department of Natural Resources, Division of Land and Water Management, Anchorage
Department of Transportation and Public Facilities, Central Region, Anchorage
Department of Transportation and Public Facilities, Division of Design and Construction, Buildings and Harbors Branch, Anchorage
Department of Transportation and Public Facilities, Permits Officer (Ms. Carol Jo Sanner), Anchorage
Division of Governmental Coordination, Office of the Governor, Juneau
Legislative Research Agency, Juneau
State Historic Preservation Officer (Ms. Judy Bittner), Anchorage
State Library, Juneau
The Honorable Tony Knowles, Governor
The Honorable Alan Austerman, Alaska State House of Representatives
The Honorable Fred Zharoff, Alaska State Senate

Organizations:

Alaska Center for the Environment, Anchorage, Alaska
Alaska Chapter Sierra Club, Anchorage, Alaska
Alaska Fisheries Development Foundation, Anchorage, Alaska
Alaska Native Foundation, Anchorage, Alaska
Alaska State Chamber of Commerce, Anchorage, Alaska
Anchorage Audubon Society, Anchorage, Alaska
Environmental and Natural Resources Institute, Anchorage, Alaska
International Organization of Masters, Mates, and Pilots, Ketchikan, Alaska
Resource Development Council, Anchorage, Alaska
The Wilderness Society, Anchorage, Alaska
Totem Ocean Trailer Express, Anchorage, Alaska
Trustees for Alaska, Anchorage, Alaska
University of Alaska Library, Government Documents Collection, Anchorage, Alaska
University of Alaska Library, Fairbanks, Alaska
University of Alaska School of Engineering, Anchorage, Alaska
University of Alaska School of Engineering, Fairbanks, Alaska

Local:

Aleutian Dragon Fisheries, Chignik, Alaska
Bristol Bay Borough Manager, Naknek, Alaska
Bristol Bay Coastal Resource Service Area, Dillingham, Alaska (Ms. Sue Flensburg)
Bristol Bay Native Association, Dillingham, Alaska (Mr. Terry Hoefferle)
Bristol Bay Native Corporation, Anchorage, Alaska (Mr. Paul Ruehl and Mr. Tom Hawkins)
Chignik City Administrator, Donald Braun
Chignik Mayor, Honorable Aloys Kopun
Far West, Inc. (Chignik Native Corporation) (Mr. Calvin Skonberg)
Lake and Peninsula Borough, King Salmon, Alaska (Mr. John Purcell)
Lake and Peninsula Borough Mayor, Honorable Glen Alsworth Sr., King Salmon, Alaska

2. CORRESPONDENCE

Letter of intent from City of Chignik, February 21, 1996

Correspondence on the November 1995 Interim Feasibility Report and Draft Supplemental Environmental Impact Statement (DSEIS), with Corps responses when appropriate:

Letter from Alaska Department of Transportation and Public Facilities (ADOT/PF) to city of Chignik, December 14, 1995, enclosing letter from ADOT/PF to U.S. Army Corps of Engineers (Corps), Alaska District, November 20, 1995
Letter from Lake and Peninsula Borough to Alaska Division of Governmental Coordination, December 15, 1995
Letter from Bristol Bay Native Corporation, December 20, 1995
Letter from Federal Aviation Administration, January 29, 1996 (with Corps response)
Letter from Alaska Division of Governmental Coordination, January 31, 1996 (with Corps responses)
Letter from U.S. Department of Health and Human Services, February 1, 1996
Letter from U.S. Environmental Protection Agency with enclosure, February 8, 1996
Letter from U.S. Department of the Interior, February 12, 1996

Earlier correspondence on the Feasibility Report and the DSEIS:

Letter from State of Alaska Department of Fish and Game, April 5, 1995
Letter from National Marine Fisheries Service, October 16, 1995

Correspondence on the 1989 DSEIS (Quarry Policy Change):

Letter from Environmental Protection Agency, December 11, 1989
Letter from State of Alaska Division of Governmental Coordination, July 20, 1990
Letter of Agreement Between the U.S. Fish and Wildlife Service and the U.S. Army Engineer District, Alaska, for Quarry Site Evaluation
Letter of Agreement Between the Alaska Governor's Office, Division of Governmental Coordination, and the U.S. Army Corps of Engineers, Alaska District, for Quarry Site Evaluation

Correspondence on the 1987 FEIS:

Letter from U.S. Fish and Wildlife Service, September 26, 1984
Letter from National Marine Fisheries Service, October 16, 1984
Letter from State of Alaska Department of Natural Resources, July 22, 1985
Letter from State of Alaska Division of Governmental Coordination, March 16, 1987
Letter from State of Alaska Division of Governmental Coordination, June 9, 1988
Letter from Environmental Protection Agency, May 31, 1988
Letter from Environmental Protection Agency, September 28, 1988
Letter from Environmental Protection Agency, March 16, 1989
Letter from State of Alaska Division of Governmental Coordination, April 19, 1988

Resolution from the City of Chignik, Resolution 94-06, May 6, 1994

CITY OF CHIGNIK

General Delivery • Chignik, Alaska 99564 • (907) 749-2280

February 21, 1996

Colonel Peter A Topp
Alaska District Engineer, Corps of Engineers
P.O. Box 898
Anchorage, Ak 99506-0898

Dear Colonel Topp:

The City of Chignik has reviewed the Chignik Harbor feasibility report. The cost estimate in the final report indicates that the fully funded cost for the project will be $11,117,000 (1998 dollars). The general navigation features, consisting of the breakwaters and the entrance channel, will cost an estimated $5,614,000. Since the project is a navigation project, the City of Chignik will be responsible for 20% of the cost of the general navigation features, or $1,123,000. Of this amount, half will be provided as an initial cash contribution for construction, with the remainder able to be paid to the Federal government over a 30 year period. The city will also be responsible for 100% of the estimated cost of the inner harbor facilities of $5,503,000.

The City of Chignik's total financial commitment to the harbor project is an estimated $6,626,000. The city plans to finance the harbor project through State of Alaska appropriations, grants and bonds from the Lake and Peninsula bourough, and city funds.

The City of Chignik is prepared to commit to the following proposed clauses of agreement:

a. Provide and maintain, at its own expense, the local service facilities, consisting of the mooring basin and the mooring facilities.

b. Provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the constructions, operation, and maintenance of the general navigation features and the local service facilities.

c. Provide all improvements required on lans, easement, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the construction, operation, and maintenance of the general navigation features and the local service facilities. Such improvements may include, but are not necessarily limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and dewatering pumps and pipes.

d. 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:

* 10 percent of the costs attributable to dredging to a depth not in excess of 20 feet.

* 25 percent of the costs attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet.

* 50 percent of the costs attributable to dredging to a depth in excess of 45 feet.

e. Repay with interest, over a period not to exceed 30 years following completion of the period of construction of the Project, an additional 0 to 10 percent of the total cost of construction of general navigation features depending upon the amount of credit given for the value of lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas provided by the Non-Federal Sponsor for the general navigation features. If the amount exceeds 10% 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, right-of-way, relocations, and dredged or excavated material disposal areas, in excess of 10% of the total cost of construction of the general navigation features.

f. For so long as the Project remains authorized, operate and maintain the local service facilities and 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.

g. Give the Federal Government a right to enter, at reasonable times and in reasonable manner, upon property the 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 and maintaining the general navigation features.

h. Hold and save the United States free from all damages arising from the contruction, operation, and maintenance 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.

i. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Project, for a minimum of three 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 Trants and Cooperative Agreements to State Local Governments at 32 C.F.R. Section 33.20.

j. 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 undet the Comprehensive Environmental Reponse, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or right-ofway that the Federal Government determines to be necessary for the construction, operation, and maintenance of the general navigation servitude, only the Government shall perform such investigations 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.

k. 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-wat that the Federal Government determines to be necessary for the construction, operation, or maintenance of the general navigation features.

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

m. 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 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, and maintenance, of the general navigation features, and inform all affected persons of applicable benefirs, policies, and procedures in connection with said Act.

n. 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 6007, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army".

o. Provide a cash contribution equal to the following percentages of total historic preservation mitigation and data recovery costs attributable to commercial nabigation that are in excess of one percent of the total amount authorized to be appropriated for commercial navigation:

* 10 percent of the costs attributable to dredging to a depth not in excess of 20 feet.

* 25 percent of the costs attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet.

* 50 percent of the costs attributable to dredging to a depth in excess of 45 feet.

We look forward to working with you as we move to final design and construction of this much needed community facility.

Sincerely,

Richard Skonberg

Richard Skonberg
Mayor, City of Chignik

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

REGIONAL DIRECTOR, CENTRAL REGION

P.O. BOX 196900
ANCHORAGE, ALASKA 99519-6900
(TDD 266-1442)
(907) 266-1440 (FAX 248-1573)

December 14, 1995

RE: Chignik Harbor

Donald J. Braun
City Administrator
City of Chignik
General Delivery
Chignik, Ak 99564

Dear Mr. Braun:

You have requested a letter of support for the Chignik Small Boat Harbor project. The development of a small boat harbor in Chignik is a priority project. Enclosed is a copy of a letter from Commissioner Perkins to the Corps of Engineers, expressing our support for the project.

The high priority of this project is due to the importance of the boat harbor to the City of Chignik, the surrounding communities and the state's commercial fishery. This harbor will provide the only harbor between Kodiak and Sand Point. Kodiak is over 200 miles to the northeast and Sand Point is over 100 miles to the southwest. Due to the remoteness and the severe weather experienced in this area, this harbor is important as a refuge from storms.

We have been impressed with the City's active involvement with this project. It is our understanding that Chignik incorporated as a second class city in 1983 primarily to act as a sponsor for this project. The City's assessment of a 1% fishery tax also indicates a willingness to generate revenue which could assist in funding the project's maintenance. Throughout the development of this project the City has demonstrated its commitment to active involvement and support in moving this project forward.

The Lake and Peninsula Borough has also identified this project as a high priority. You indicated the Borough has recently committed $80,000 to this project. This is a positive indication of the support for this project by the Borough.

Based on an October 26, 1995, meeting with the Corps of Engineers (COE), this project is currently expected to require construction funding as early as July, 1997. We currently have identified over $8.6 million in COE Match Program funding needs in FY'97, including the navigation improvements for Chignik Harbor. By May, 1996, we expect to know the amount of state FY'97 funding appropriated for the department's COE Match Program.

This project is a high priority with the department. We will give the project's match funding needs careful consideration for any funding which the legislature appropriates for our COE Match Program.

If you want to discuss this project in more detail, please contact me.

Sincerely,

John D. Horn, P.E.
Regional Director

RM

Attachment: Commissioner's letter to COE

cc: Steve Bredthauer, P. E., Project Manager, COE
Harold Moeser, P.E., State Harbors Engineer, DOT&PF
Walt Wrede, Manager, Lake and Peninsula Borough

TONY KNOWLES, GOVERNOR

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
OFFICE OF THE COMMISSIONER

3132 CHANNEL DRIVE
JUNEAU, ALASKA 99801-7898

TEXT: (907) 465-3652
FAX: (907) 586-8365
PHONE: (907) 465-3900

November 20, 1995

Colonel Peter A. Topp
District Engineer
U.S. Army Corps of Engineers
P. O. Box 898
Anchorage, AK 99506-0898

Dear Colonel Topp:

Thank you for the opportunity to review and comment on the Chignik Small Boat Harbor Study. The project proposes to fill a critical gap in our coastal development by providing a safe refuge harbor on the Aleutian Peninsula immediately adjacent to a productive fishery providing significant economic benefits to the community, the State and the Nation.

The long history of this project includes a concerted effort by the community, the State and the Corps of Engineers to work toward a solution to the needs of the residents of Chignik. Of note, is their willingness in 1983 to incorporate as a community to become the official sponsor. This has greatly enhanced the community's position for receiving State support as evidenced by past participation.

The community has been successful in obtaining all funds needed to bring the project to the current threshold. While continued State participation is subject to appropriations, the Department supports the project and the community's effort in securing funding through that process.

Sincerely,

Joseph L. Perkins, P.E.
Commissioner

Lake and Peninsula Borough
P.O. Box 495
King Salmon, Alaska 99613

Telephone: (907) 246-3421
Fax: (907) 246-6602

RECEIVED
DEC 18 1995
ANCHORAGE OMB
GOVERNMENTAL COORDINATION

December 15, 1995

Arlene Murphy, Project Review Coordinator
Office of Management and Budget
Division of Governmental Coordination
3601 C Street, Suite 370
Anchorage, AK 99503

Subject: Chignik Small Boat Harbor
NEPA DEIS
File No. AK9501-41AA

Dear Ms. Murphy,

The Lake and Peninsula Borough has reviewed the Interim Feasibility Report with Draft Supplemental Environmental Impact Statement (DEIS) for the Chignik Small Boat Harbor in Chignik, Alaska. We concur with the findings in the DEIS and feel that the site selection and the construction method chosen will have the least amount of environmental impact. The Borough strongly supports this project as it will have social and economic benefits to the entire area.

We appreciate the opportunity to comment.

Sincerely,

Sheila Bergey

Sheila Bergey
Community Development Coordinator

BRISTOL BAY NATIVE ASSOCIATION
P.O. BOX 310
DILLINGHAM, ALASKA 99576
PHONE (907) 842-5257

Tribal Councils Served by BBNA:
Aleknagik
Chignik Bay
Chignik Lagoon
Chignik Lake
Clarks Point
Dillingham
Egegik
Ekuk
Ekwok
Igiugig
Iliamna
Ivanof Bay
Salmon
Kokhanok
Koliganek
Levelock
Manokotak
Naknek
New Stuyahok
Newhalen
Nondalton
Pedro Bay
Perryville
Pilot Point
Port Heiden
Portage Creek
South Naknek
Togiak
Twin Hills
shik

December 20, 1995

Alaska District Corps of Engineers
CENPPA-EN-CW-ER (Boyer)
P. O. Box 898
Anchorage, AK 99506-0898

Re: Identification No. ER 96-01

Dear Ms. Lizette Boyer;

Our office has reviewed the report entitled: Chignik, Alaska, Small Boat Harbor Interim Feasibility Report with Draft Supplemental Environmental Impact Statement completed by your office. It is an excellent report; we find no significant problems with it.

Our organization (which has member communities from Chignik, Chignik Lake, Chignik Lagoon, Perryville, and Ivanof Bay), fully support the construction of a boat harbor in Chignik. The community has been actively involved in the planning process. They have been trying for years to protect their fishing fleet from violent storms. The eastern Bering Sea is known as a "low pressure factory", and high winds are known to frequent the area. I'm sure the community and fishermen in the area are looking forward to protecting their fishing vessels and investments in their industry.

Thank you for the opportunity to provide comments on the report.

Sincerely,

BRISTOL BAY NATIVE ASSOCIATION, INC.

Terry Hoefferle,
Chief Executive Officer

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region

222 W. 7th Avenue #14
Anchorage, AK 99513-7587

January 29, 1996

Alaska District Corps of Engineers
CENPA-EN-CW-ER (Boyer)
PO Box 898
Anchorage, Alaska 99506-0898

Dear Ms. Boyer:

Chignik Small Boat Harbor Draft Supplemental EIS, COE # ER 96-01

We find the selected alternative, proposal 2B, presented in the November 1995 Draft Supplemental Environmental Impact Statement objectionable. Our determination is predicated on the potential for physical obstructions that will fall within 1000 feet of the threshold, lie inside the runway protection zone (RPZ) and under the approach to runway 2, and their associated impacts. The proposed staging area as well as a portion of the large boat slip area are the specific areas of concern. Area lighting, vehicle and equipment storage etc., in the staging area, as well as boat masts in the -16.5' MLLW area will most likely be obstructions, and possible hazards to aircraft on final approach to runway 2.

Our records (Airspace Case # 85-AAL-195NRA) indicate that FAA responded to an ADE Chignik Boat Harbor proposal in the same location with a no objectionable determination on 11/15/85. Upon closer examination of that case I found that the 1985 proposal, although located basically on the same site, differed enough from the current proposal in configuration as to result in a no objectionable determination.

On December 19, 1995 a meeting attended by DOTPF, FAA, and ADE representatives reviewed and discussed the current ADE ER 96-01 proposal. Consensus was achieved and FAA has no objection to the proposal, provided the following conditions are met.

1. That storage (of equipment and material) is not allowed in the staging area.
2. That no pole mounted area lighting be installed in the staging area.

3. That the proposed channel entrance light located at the end of the staging area peninsula, at the channel mouth be lower than the existing 20:1 approach surface. In addition we request that the light be shielded to prevent it becoming a skyward pointed light.
4. That the most westerly two or three large boat slips be abandoned to insure that boat masts do not penetrate the existing 20:1 approach surface to runway 2.

Should you have any questions I can be reached at 271-5460.

Sincerely,

James S. Perham, P.E.
Project Manager, Safety & Standards
Branch, Airports Division

Response from Alaska District, Corps of Engineers:

In response to comments from the Federal Aviation Administration (FAA) and the Alaska Department of Transportation and Public Facilities-Airport Division, the trunk of the north breakwater was realigned and the inner harbor reconfigured so that boat masts would not penetrate the existing 20:1 approach surface to runway 2. The realignment of the north breakwater reduced the staging area so that there would be limited encroachment into the area beneath the runway approach zone. The limited area still beneath the runway clear zone will be fenced off to prevent storage of equipment and material there.

Also in response to FAA, the city of Chignik will be notified that no pole-mounted area lighting is to be installed in the staging area. The U.S. Coast Guard will be notified that the channel entrance light is to be lower than the existing 20:1 approach surface (less than 90 feet), and that the light is to be shielded from the air to prevent it from becoming a skyward-pointed light.

TONY KNOWLES, GOVERNOR

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

☒ *SOUTHCENTRAL REGIONAL OFFICE*
3601 "C" STREET, SUITE 370
ANCHORAGE, ALASKA 99503-5930
PH. (907) 269-7470/FAX (907) 561-6134

☐ *CENTRAL OFFICE*
P.O. BOX 110030
JUNEAU, ALASKA 99811-0030
PH. (907) 465-3562/FAX. (907) 465-3075

☐ *PIPELINE COORINDATOR'S OFFICE*
411 WEST 4TH AVENUE, SUITE 2C
ANCHORAGE, ALASKA 99501-2343
PH (907) 271-4336/FAX (907) 272-0690

January 31, 1996

Lizette Boyer
Alaska District Corps of Engineers
CENPA-EN-CW-ER (Boyer)
P.O. Box 898
Anchorage, AK 99506-0898

Dear Ms. Boyer:

SUBJECT: FINDING FOR NEPA NOVEMBER 1995 SDEIS
Chignik Small Boat Harbor Redesign
State I.D. No. AK9501-41AA

The Division of Governmental Coordination (DGC) has concluded the State of Alaska's review of the Supplemental Draft Environmental Impact Statement (SDEIS) for the proposed Chignik, Alaska, Small Boat Harbor. Our comments are submitted according to the National Environmental Policy Act (NEPA). We appreciate the opportunity to participate in this planning effort, and offer a consolidated response on behalf of the State resource agencies (Alaska Departments of Environmental Conservation, Fish and Game, and Natural Resources).

The State previously participated in the scoping reviews in 1987, 1988 and 1989, under State I.D. No. 870210-13A, 880419-19A and 891120-12A.

The proposed project is for a protected harbor at Chignik, Alaska, a fishing and seafood processing community on the south shore of the Alaska Peninsula.

Four alternative harbor sites, all on the east side of Anchorage Bay, were initially identified by the U.S. Army Corps of Engineers (COE) for study. Two of the alternatives, sites 2 and 3, were studied in detail. Site 2 is considered the best harbor site.

The Plan 2B design at Site 2 is the preferred alternative. The harbor area is a shallow, sandy flat bordered by a small marsh. The harbor breakwaters would enclose a 9.0 acre mooring basin and a 2.4 acre tideland staging area. Moorage basin dredging and breakwater and staging area fill would affect 23 acres of tideland and seabed. Plan 2B was selected because it met identified public concerns and because of its net positive contributions to the goals of National Economic Development.

There were no specific NEPA comments submitted by the state resource agency reviewers.

Alaska Coastal Management Program comments were provided by the departments of Natural Resources and Fish and Game.

Your completed Coastal Project Questionnaire identified navigational servitude as the reason for not complying with state tideland permitting requirements. The Department of Natural Resources (DNR), Division of Land (DOL) provided a copy of their December 15, 1995 letter to you addressing necessary DNR, DOL authorizations. In that letter DNR also requested further information concerning the legal grounds for citing navigational servitude for this proposed project. Please provide this office with a copy of any correspondence regarding this issue. 1

To clearly state the timing restrictions for the breakwater construction portion of the project the Department of Fish and Game recommended that the last paragraph of section 4.2.4 on Page EIS 26 be reworded as follows (underlined text to be added, bold text to be deleted): advised that construction activities be scheduled to avoid affecting use of the area by juvenile anadromous salmon. To avoid causing such impacts, in-water work is recommended to avoid spring migration (March 20 to May 15). No construction work would be conducted during the spring migration period. An A fall adult salmon migration window (July 29 30 to September 10) is also recommended. A construction scenario to protect fish as much as possible but still take advantage of the summer construction season was discussed with the USFWS and the ADF&G. This scenario would be to start construction on May 16 on the southern breakwater, moving northward. Construction is expected to last 2 months per breakwater. Provided work on the southern breakwater has been completed, the northern breakwater can be constructed during the fall restricted period (i.e., July 30 to September 10). The shallow water conditions in the area would lessen fish disturbances because during low tides work can be conducted in the dry. After the breakwaters are constructed, the basin and entrance channel would be dredged. 2

An Alaska Coastal Management Program consistency review will be conducted upon receipt of the Record of Decision for the Final Environmental Impact State, updated Coastal Project Questionnaire (if appropriate), copies of necessary permit applications and public notice(s).

Thank you for the opportunity to comment at this phase of the project design.

Sincerely,

Arlene Murphy
Project Review Coordinator

1 A State tidelands permit application has been submitted by the city of Chignik which includes all project features and associated land leasing information. A copy of the application will be included with the coastal project questionnaire submitted for the Alaska Coastal Management Program review.

2 The timing window has been changed in the FSEIS.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30341-3724

February 1, 1996

Colonel Peter A. Topp
Alaska District Corps of Engineers
CENPA-EN-CW-ER (Boyer)
P.O. Box 898
Anchorage, Alaska 99506-0898

Dear Colonel Topp:

We have completed our review of the Draft Supplemental Environmental Impact Statement (DSEIS) and Interim Feasibility Report for the Chignik, Alaska Small Boat Harbor. We are responding on behalf of the U.S. Public Health Service.

We have reviewed the Draft Supplement and Interim Report for potential adverse impacts on human health, and we believe related issues have been adequately addressed in this draft document.

Thank you for the opportunity to review and comment on this draft document. Please ensure that we are included on your mailing list to receive a copy of the Final EIS, and future EIS's which may indicate potential public health impact and are developed under the National Environmental Policy Act (NEPA).

Sincerely yours,

Kenneth W. Holt

Kenneth W. Holt, M.S.E.H.
Special Programs Group (F29)
National Center for Environmental
Health

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

February 8, 1996

Reply to
Attn of: WD-126

REF: 87-002-COE

Colonel Peter A. Topp
U.S. Army Corp of Engineers
Alaska District
CEN-EN-CW-ER (Boyer)
P.O. Box 898
Anchorage, AK, 99506-0898

Dear Colonel Topp:

The Environmental Protection Agency has reviewed the Interim Feasibility Report with Draft Supplemental Environmental Impact Statement (draft EIS) prepared for the proposed **Small Boat Harbor at Chignik, Alaska** in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. Our review has revealed no potential environmental concerns that would require substantive changes to the proposal. As a consequence, we are assigning a Lack of Objections (LO) rating to the proposal. This rating will be published in the *Federal Register*. For your reference, I have attached a copy of the rating system used in our evaluation of the DEIS.

Thank you for the opportunity to review the draft EIS. Should you have any questions about our review, please feel free to contact me at (206) 553-8561.

Sincerely,

William M. Ryan
Environmental Review Team

attachment

U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action*

Environmental Impact of the Action

LO - - Lack of Objections

The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC - - Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO - - Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU - - Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 - - Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 - - Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonaby available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 - - Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1689 C Street, Room 119
Anchorage, Alaska 99501-5126

ER 95/864

FEB 12 1996

Peter A. Topp, Colonel
Alaska District Corps of Engineers
CENPA-EN-CW-ER (Boyer)
P.O. Box 898
Anchorage, Alaska 99506-0898

Dear Colonel Topp:

In response to your November 29, 1995 request, we have reviewed the Draft Interim Feasibility Report and Draft Supplemental Environmental Impact Statement for the proposed Chignik, Alaska Small Boat Harbor. We have no comments to offer at this time.

Sincerely,

Regional Environmental Officer - Alaska

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

# of pages ▶ 1

To Boyer	From Mutter
Dept./Agency	Phone # 271-5011
Fax #	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

TONY KNOWLES, GOVERNOR

DEPARTMENT OF FISH AND GAME
HABITAT AND RESTORATION DIVISION

333 RASPBERRY ROAD
ANCHORAGE, ALASKA 99518-1599
PHONE: (907) 344-0541

April 5, 1995

Ms. Lizette Boyer
U.S. Army Engineer District, Alaska
Environmental Resources Section
P.O. Box 898
Anchorage, Alaska 99506-0898

Dear Ms. Boyer:

Re: Chignik Small Boat Harbor - Reconfiguration (SID AK9501-41AP)

The Alaska Department of Fish and Game (ADF&G) has reviewed the March 30, 1995, draft plan view of the proposed modification to the Chignik Small Boat Harbor. The revised project entails construction of two breakwaters connected to the shoreline and associated dredging along the east shore of Anchorage Bay near the village of Chignik. The seaward side of both the north and the south breakwaters will be sloped at 4 horizontal to 1 vertical measurements to simulate the shallow beaches that exist at the site. A staging area for parking, harbor management offices, restrooms, etc., will be found atop both breakwaters.

Road access to the north breakwater will require crossing a fish bearing waterway. During site investigations conducted in May 1983 by the U.S. Fish and Wildlife Service, Dolly Varden were minnow trapped in the wetland/stream complex located immediately east of the beach berm at the proposed harbor site. We note that the March 30 plan view identifies culverting in the intertidal area as the means of passing the stream beneath the north breakwater access road. However, your letter of January 5, 1995, states that a bridge will be used to span the stream.

The following comments are provided to assist you in preparing an environmental evaluation leading to development of a revised final environmental impact statement (EIS).

Anadromous Fish: The stream located immediately south of the south breakwater's shoreline terminus has been specified as being important for the spawning, rearing, or migration of anadromous fish pursuant to AS 16.05.870(a). Pink salmon spawn in this system. The stream also provides habitat used by rearing Dolly Varden. Project designs must address concerns of natural bedload sediment dispersal at the mouth of the stream so as to prevent the creation of a berm that blocks fish access to or egress from the system. Construction timing windows will be necessary to offset temporary water quality perturbations associated with dredging and filling operations. To prevent interference with juvenile salmon outmigration, inwater construction

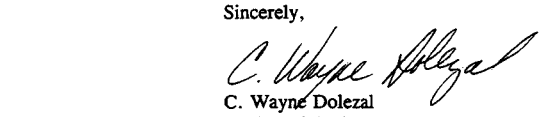
should not occur during the period March 20 through May 15. Likewise, to prevent interference with adult fish returning to the system, inwater work should not occur during the period July 10 through August 30.

Quarry Site: During 1990, a supplemental draft EIS for the Chignik small boat harbor was prepared which deleted Castle Bay as the designated, project-specific quarry site for this project's riprap and other fill materials. Although the original discussions concerning operation and impacts at the proposed Castle Bay quarry were retained in the supplemental draft EIS, additional portions were added which include the generic, boilerplate developed by the U.S. Army Corps of Engineers (USACE) to describe quarry site operations and impacts. During the state's informational review (i.e., SID AK891120-12A) of the supplemental draft EIS, four NEPA-related and two ACMP-related questions were raised. Answers to those questions should be included in the revised EIS for the redesigned harbor. Specifically, procedures found in the June 1990 Letter of Agreement between the Division of Governmental Coordination and the USACE for quarry site evaluation as they apply to this project should be detailed. I have enclosed a copy of the July 20, 1990 Information Review letter and a copy of the Letter of Agreement for your use.

Culverts: Road-crossing structures in fish-bearing streams must be designed, constructed, and maintained to insure that they do not hinder upstream and downstream movements of either juvenile or adult fish. The requirement to provide for unimpeded fish passage applies equally to resident and anadromous fish species. If culverts are used, the following information will assist in the design and culvert sizing for the crossing. The ADF&G requires that the invert of all culverts is set below the streambed. Specifically, we require that both the inlet and outlet of round culverts be buried at a depth of either 20% of the culvert's diameter or 18 inches, whichever is less. The inverts of elliptical or arch culverts must be set at least 12 inches below the streambed. In most instances culverts up to 80 feet long must be set at an effective slope of not more than 1 percent. Culverts longer than 80 feet must be set at an effective slope of 0.5 percent or less.

We appreciate the opportunity to comment. Should you have any questions, do not hesitate to contact me.

Sincerely,



C. Wayne Dolezal
Habitat Biologist
Habitat and Restoration Division
Alaska Department of Fish and Game
(907) 267-2284

Enclosure

cc: W. Donaldson, ADF&G
A. Quimby, ADF&G
L. Schwarz, ADF&G
A. Murphy, OMB/DGC
L. Fairchild, USFWS
B. Smith, NMFS
H. Smith, ADOT&PF

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
222 West 7th Avenue, Box 43
Anchorage, Alaska 99513-7577

October 16, 1995

Guy R. McConnell
Chief, Environmental Resources Section
Corps of Engineers - Alaska District
P.O. Box 898
Anchorage, Alaska 99506-0898

ATTN: L. Boyer

Dear Mr. McConnell:

Thank you for your letters concerning Threatened or Endangered Species found in the area of two Corps projects; a defense restoration clean up site near Nome and the Chignik boat harbor. The threatened Steller (Northern) sea lion occurs in the vicinity of both projects. You have identified Sledge island as a haul out site for the sea lion. We have no further site specific information concerning these projects.

Your conclusion that the Chignik boat harbor project would have no effect on listed species is noted. With this determination by the Federal action agency, no further coordination or consultation under the Endangered Species Act is necessary. However, we recommend the final assessment include an evaluation of the quarry site for the harbor project.

Please direct any questions to Brad Smith at (907) 271-5006.

Sincerely,

Ronald J. Morris
Western Alaska Office Supervisor
Protected Resources Management Division

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

DEC 1 : 1989

Reply To
Attn Of: WD-136

Mr. William Lloyd
U.S. Army Corps of Engineers
Alaska District
ATTN: CENPA-EN-PL-ER
P.O. Box 398
Anchorage, Alaska 99510

Dear Mr. Lloyd:

The Environmental Protection Agency (EPA) has reviewed the Chignik, Alaska - Small Boat Harbor Draft Supplemental Environmental Impact Statement (EIS). Our review was conducted in accordance with the National Environmental Policy Act (NEPA) and our responsibilities under section 309 of the Clean Air Act.

The purpose of this draft supplemental EIS is to introduce Alaska District's new procedure of not designating a specific quarry site for water resources projects. This new procedure will allow the contactor the flexibility of selecting a quarry site to provide specific rock for new water resource projects. For the Chignik harbor project, the new procedure would allow the construction contractor to propose a quarry site for the rubblemound breakwater and other features of the project. The final EIS for Chignik harbor improvement originally identified the Castle Bay quarry site as the designated quarry for armor rock for the breakwater.

The final supplemental EIS needs to clarify what is involved in alternative 2 - Non-designated Quarry Procedure. The draft supplemental EIS states that the contractor can only select an existing quarry as a rock source. However, it also states that the contractor would need to submit a quarry development plan for use of an existing quarry site as well as for use of a new quarry (p. 13, first paragraph). Is the contractor limited to using only existing quarry sites? If the contractor is not limited to using existing quarry sites as the discussion on page 13 implies, then it appears that the contractor has three options under Alternative 2: use an existing quarry site, develop a new quarry site at Castle Bay, and develop a new quarry site at some location other than Castle Bay. The final supplemental EIS should show the location of any known existing quarry sites in the project area and clarify whether a contractor can develop a new quarry site.

We concur with the list of "Resources of Concern" developed by Alaska District in conjunction with the Fish and Wildlife Service. It provides a useful checklist for potential impacts to highly valued habitats, species, and other protected lands. We are pleased to see that quarry sites that could potentially affect any of the fourteen resources of concern would be subject to site-specific environmental review. The final supplemental EIS should clarify that these reviews would be conducted in accordance with the provisions of NEPA.

We disagree with the statement on page 23 that "a large portion of potential impacts are avoided which could be otherwise severe if an undeveloped area were opened for quarry use." Many significant impacts could occur as a result of quarry operation as well as quarry development. The draft supplemental EIS goes on to state that "mitigation measures can be followed to offset environmental effects" from quarry operation (blasting, burning, clearing, processing, solid waste disposal, and grading/plowing). The final supplemental EIS needs to describe the effectiveness of the mitigation measures listed in the draft supplemental EIS. It should also describe who is responsible for ensuring that the required mitigation is carried out at quarry sites that will be used for water resources projects.

On the basis of our review we are rating this draft supplemental EIS EC-2 (Environmental Concerns - Insufficient Information). Our environmental concerns are based on the potential for adverse effects resulting from quarry operation. Without a description of the effectiveness of the described mitigation measures and who would be responsible for ensuring that mitigation is carried out, we cannot assume that any adverse effects could be minimized. Additional information and clarification is needed to fully describe the alternatives, whether the site-specific environmental reviews would be conducted in accordance with NEPA, and the effectiveness of the mitigation measures listed in the draft supplemental EIS.

An explanation of the EPA rating system for draft EISs is enclosed for your reference. This rating and a summary of EPA's comments will be published in the Federal Register.

We appreciate the opportunity to review this draft supplemental EIS. If you have any questions about our comments please contact Sally Brough in our Environmental Review Section at (206) 442-4012 or (FTS) 399-4012.

Sincerely,

for Ronald A. Lee, Chief
Environmental Evaluation Branch

STEVE COWPER, GOVERNOR

CENTRAL OFFICE
P.O. BOX AW
JUNEAU, ALASKA 99811-0165
PHONE: (907) 465-3562

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

SOUTHEAST REGIONAL OFFICE
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NORTHERN REGIONAL OFFICE
675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 451-2818

REGISTERED MAIL
RETURN RECEIPT
REQUESTED

July 20, 1990

Ms. Lizette Boyer
U. S. Army Engineer District Alaska
CENPA-EN-PL-ER
P.O. Box 898
Anchorage, AK 99506-0898

Dear Ms. Boyer:

SUBJECT: CHIGNIK SMALL BOAT HARBOR - INFORMATIONAL REVIEW
SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT
STATE I. D. NO. AK891120-12A
REVISED SUMMARY OF COMMENTS

The Division of Governmental Coordination (DGC) has completed coordinating the state's review of the above referenced document. This letter consolidates comments on the document from the Alaska Departments of Environmental Conservation (DEC), Fish and Game(DFG) and Natural Resources(DNR), and the Bristol Bay Coastal Resource Service Area Coastal District.

The purpose of the Draft Supplemental Environmental Impact Statement (DSEIS) is to propose a new procedure for U. S. Army Corps of Engineers (COE) civil works projects in Alaska and to describe how the procedure will effect the Chignik Small Boat Harbor project. The procedure was first announced by the COE in letters to the resource agencies dated January 27, 1989. In this DSEIS, the procedure is described on pages 4, 5, 8 and 13, and is also discussed throughout the document.

In summary, the procedure states that the COE will no longer select an armor rock quarry site for water resource projects. Instead, the COE will require its contractor to select an existing quarry site and propose it to the COE for agency review.

Specifically for the Chignik project, the COE proposes to delete the quarry site which was previously selected by the COE, an undeveloped site in Castle Bay near Chignik. The Castle Bay site was included in the Draft and Final Detailed Project Report and

Environmental Impact Statement, therefore, the DSEIS was issued to update the National Environmental Policy Act (NEPA) documentation on the quarry component of the project.

A Letter of Agreement (LOA) has recently been developed between the COE and DGC, on behalf of the resource agencies, to address the policy question of whether the state can require the COE to submit quarry site development plans for consistency review when the contractor selects the quarry location.

The LOA provides guidance regarding consistency reviews of quarry sites associated with COE civil works projects. Because the LOA addresses agency concerns related to quarry development, any discussion of phasing of COE civil works project reviews has been deleted from these comments. The stipulation language in the LOA will appear in the future finding regarding consistency of the Chignik project with the ACMP. A copy of the LOA is attached for your review.

Comments related to NEPA are summarized separately from comments related to the Alaska Coastal Management Program (ACMP).

NEPA Comments

1. The DSEIS does not clarify how the new procedure will ensure that an assessment of alternative quarry sites is completed pursuant to NEPA. In the original NEPA documents on this project, alternatives to the Castle Bay quarry site were discussed. With the new procedure, no site is selected at the time the NEPA document is prepared, therefore, no alternatives assessment is completed by the COE. When the COE's contractor selects a quarry site, the new procedure calls for further NEPA assessment only if a non-existing quarry site is selected. This does not appear to be an adequate implementation of the intent of NEPA. We suggest that the Final SEIS (FSEIS) inventory the quarry sites available for this project, indicate their suitability for use, and the impacts associated with their use. If this cannot be done, the FSEIS should, at a minimum, discuss how a satisfactory alternatives assessment will be accomplished for this project, or why it has been omitted.

2. The DSEIS does not identify how the economic feasibility of the Chignik project has been effected by the deletion of the quarry site. Reviewers raised concerns that the lack of a designated quarry site prevents an overall economic assessment of the project. Perhaps the FSEIS could discuss how economic feasibility of this project has been addressed by the COE under the new procedure.

3. While the DSEIS addresses the Chignik project, it also appears to address the new COE procedure pursuant to NEPA. Reviewers commented that a NEPA review of the procedure was appropriate, however, it was inappropriate to build a case for the new procedure in a document concerned with a specific project. A separate programmatic NEPA document on the new procedure would have been a more direct means of addressing the larger, potentially statewide issues raised by the new procedure.

4. One reviewer questioned whether the DSEIS attempted to provide NEPA documentation of environmental effects for all quarry sites in Alaska, via its discussion of "typical" quarry operations. You have since responded verbally that this was not an intent of the DSEIS. A statement to this effect in the FSEIS would prevent further confusion on this point. Another concern was raised regarding the COE's assumption that "typical" existing quarry operations have already incorporated environmental controls and mitigating measures. Reviewers believe this assumption is inappropriate. However, the ACMP process suggested below may address this concern by allowing consistency reviewers to review the contractor's quarry development plan once it is available.

ACMP Comments

1. The ACMP review process defined by 6 AAC 50 provides applicants with the state's finding on each specific project design in a specific site within the state's coastal zone management boundary. Reviewers noted that they could not make a finding on an unidentified quarry site. Until a site and a specific quarry development plan are defined, this component of the Chignik project cannot be evaluated against the ACMP Standards or the Policies of the Bristol Bay Coastal Resource Service Area (BBCRSA) Coastal Program. Therefore, the reviewers' ACMP-related comments on the DSEIS were general and procedural rather than specific to the project design.

2. Because many existing quarry sites in Alaska are located within the state's coastal zone, it is likely that development in an existing quarry would call for a coastal consistency review. One reviewer noted that there are no existing quarry sites within Bristol Bay, therefore, the quarry site proposed for the Chignik Project could be located within the boundaries of another coastal district. Development activity would be reviewed against the approved policies of that coastal district.

Thank you for the opportunity to comment.

Sincerely,

Alison L. Smith
Project Review Coordinator

Enclosure

cc: Wayne Dolezal, DFG
Tim Rumfelt, DGC
Greg Curney, DNR
Sue Flensberg, BBCRSA

LETTER OF AGREEMENT
BETWEEN THE
U.S. FISH AND WILDLIFE SERVICE
AND THE
U.S. ARMY ENGINEER DISTRICT, ALASKA
FOR
QUARRY SITE EVALUATION

This agreement provides guidance and establishes procedures for assessing the environmental impacts associated with the selection and operation of quarry sites for Civil Works Projects.

GENERAL:

The U.S. Army Engineer District, Alaska will allow the construction contractor to select a quarry site to provide specific rock necessary for construction of water resources projects.

WORK REQUIRED DURING THE PROJECT STUDY PHASE:

The National Environmental Policy Act (NEPA) documentation will reflect that the construction contractor will use an existing quarry site. The environmental assessment or impact statement and Coordination Act report will assess the impacts associated with quarry operations of a generic existing site. The Quarry and Environmental portions of the Plans and Specifications (bidding document) will inform the contractor of his responsibilities in case he chooses to open a new site. The U.S. Fish and Wildlife Service (FWS) will be furnished with a copy of the Plans and Specifications.

WORK REQUIRED AFTER THE BID AWARD:

A representative of the Alaska District Environmental Resources Section (PL-ER) will attend the pre-construction conference, advise the contractor of the NEPA procedure, and reiterate the requirements outlined in the Plans and Specifications. The contractor will be required to submit a Quarry Operation Plan (which includes the exact location of the quarry site) for review and government approval.

<u>If the contractor chooses an existing quarry</u>: The PL-ER representative will advise FWS of the selection and will advise the contractor of any permits which may be required or other stipulations associated with the operation. No further NEPA documentation or Fish and Wildlife Coordination Act activities will be required.

<u>If the construction contractor chooses a new quarry site</u>:

1. The PL-ER representative will contact FWS and advise that the NEPA process has been reopened.

2. The PL-ER representative will consult with FWS and other state and Federal environmental agencies, provide the exact location of the proposed quarry, and obtain the agencies' comments. Within 10 working days, the PL-ER representative will meet with the contracting officer's representative (COR) and contractor to advise whether the site is:

a. acceptable;

b. acceptable with stipulations;

c. no decision until further data are gathered; or

d. unacceptable.

If the site appears to be acceptable, the PL-ER representative will provide the contractor through the COR the mitigation stipulations, if any. If further information is required in order to make a decision, the COR will provide the contractor an estimate of time required for data collection.

3. The Alaska District and FWS will enter into a transfer fund agreement as mandated in the Fish and Wildlife Coordination Act only if further documentation is required. The normal Scope of Work process will be used.

4. Upon completion of the data gathering and documentation, the FWS will submit an amended Coordination Act report with mitigation recommendations to the Alaska District. The Alaska District will give a written response to the recommendations of the FWS. The Alaska District will either write an environmental assessment or supplement an existing impact statement, or write a new impact statement for all new quarry site selection(s).

UNRESOLVED PROBLEMS:

In carrying out the above agreement, every effort will be made to resolve all problems in the following order:

FWS and Alaska District project biologist level.

FWS Field Office Supervisor and Alaska District Planning Branch Chief level.

Assistant Alaska Regional Director for Habitat and Alaska District Engineering Division Chief.

Alaska Regional Director and Alaska District Engineer.

If a solution still cannot be achieved, the problem should be referred to the North Pacific Division and the Alaska Regional Director. Only unresolved problems that threaten the two agencies' abilities to carry out their mandated responsibilities should be referred to the Director of Civil Works, U.S. Army Corps of Engineers, and Director, Fish and Wildlife Service for resolution. Any referrals to the Washington level shall document the specific nature of the problems and efforts at the field level to resolve the disagreements.

21 MAR 89	4/21/89
William W. Kakel Date	Walter O. Stieglitz Date
Colonel, Corps of Engineers	Regional Director
District Engineer	U.S. Fish and Wildlife Service

LETTER OF AGREEMENT
BETWEEN THE
ALASKA GOVERNOR'S OFFICE, DIVISION OF GOVERNMENTAL COORDINATION
AND THE
U.S. ARMY CORPS OF ENGINEERS, ALASKA DISTRICT
FOR
QUARRY SITE EVALUATION

This agreement provides guidance and establishes procedures for ensuring the consistency with the Alaska Coastal Management Program of quarry sites for Civil Works Projects administered by the U.S. Army Corps of Engineers (COE) that are located within or directly affect the state's coastal zone.

GENERAL:

The U.S. Army COE, Alaska District, will require a construction contractor to select a quarry site to provide rock necessary for construction of water resources projects and will not specify a quarry site in its Plans and Specifications. All permits and/or easements will be the responsibility of the contractor and the contractor will not be allowed to proceed with quarry site development until all permits and/or easements and the necessary ACMP consistency determination have been obtained.

The Division of Governmental Coordination (DGC) will coordinate the state's review of the contractor's selection for consistency with the Alaska Coastal Management Program (ACMP). This Letter of Agreement (LOA) allows for an appropriate consistency review of the quarry site, once it is selected by the contractor, as a direct federal action as provided by Section 307 of the federal Coastal Zone Management Act. The COE is responsible for implementing the terms of this LOA and for participating in consistency reviews, as necessary.

WORK REQUIRED DURING THE PROJECT STUDY PHASE:

The National Environmental Policy Act (NEPA) documentation and associated ACMP project consistency review will assume that the construction contractor will use an existing quarry site. The environmental assessment (EA) or environmental impact statement (EIS) will assess the impacts associated with quarry operations of a "generic existing quarry site" and will identify appropriate impact mitigation measures.

The State of Alaska, DGC will conduct a consistency review for a "generic existing quarry site" at the time it reviews the associated water resources project, and will render a conclusive coastal consistency determination which will identify alternative measures (reflected as stipulations) necessary to ensure that the generic existing quarry site and project are consistent to the maximum extent practicable with the ACMP.

The Quarry and Environmental portions of the Plans and Specifications (bidding document) will inform the contractor of its responsibilities whether he or she selects an existing quarry site or opens a new quarry and will also advise them of the review requirements agreed to in this LOA. The DGC will be furnished with a copy of the Plans and Specifications.

WORK REQUIRED AFTER THE BID AWARD:

The COE will advise the contractor of the requirements outlined in the Plans and Specifications. The contractor will be required to submit to the COE a Quarry Development Plan including the exact location of the quarry site. Before the COE gives approval to proceed with quarry site development, the appropriate ACMP approval must be obtained.

If the contractor chooses an existing quarry:

Concurrent with its review of the contractor's submittal, the COE will notify DGC in writing of the contractor's quarry site selection and provide a copy of the Quarry Development Plan to DGC. In addition, except for situations described in (a) below, the contractor will provide a Coastal Project Questionnaire to DGC for review. Depending on the site selected, the following requirements apply.

a) No review by DGC will be required if:

   1) a contractor purchases the rock necessary for a project from an operating commercial quarry site; or

   2) the quarry site from which the contractor proposes to obtain the necessary rock is located out of state, outside of the coastal zone, or does not directly affect the coastal zone.

b) DGC will require not more than 15 days to review and comment on the selection and operation if a contractor proposes to use, without modifications, a quarry site, which has previously been found consistent with the ACMP.

c) DGC will conduct a 30-day consistency review of the proposal, as per 6 AAC 50, if a contractor proposes to use an existing quarry site:

   1) with modifications, (e.g. changes to previously approved site boundaries, volumes to be removed, or other terms or conditions); or

2) that has not previously undergone a consistency review.

The contractor must submit to DGC all appropriate permit applications that apply to the quarry site.

If the construction contractor chooses a new quarry site (including sites that have been reclaimed):

1. The COE will notify the contractor in writing that the NEPA process has been reopened and that an ACMP consistency review is required for sites located within or directly affecting the coastal zone.

2. For those sites which require coastal consistency review, the COE will provide a copy of the notification letter, the Quarry Development Plan, and the exact location of the proposed quarry to DGC. All appropriate permit applications and a coastal project questionnaire will be submitted to DGC by the contractor.

3. The COE will prepare a NEPA document, either an EA or an EIS, covering the environmental impacts of the contractor's proposed new quarry site. DGC will coordinate the state's review of this document. Compliance with the procedural requirements of NEPA by the COE does not relieve the contractor from responsibility for obtaining necessary permits and/or easements for the proposed quarry.

4. DGC will conduct a 50-day consistency review of the proposal, as per 6 AAC 50. DGC will provide the COE the state's conclusive consistency determination for the new quarry site.

IMPLEMENTATION:

As a result of the procedures outlined in this LOA, the state and COE may agree to alternative measures (reflected as stipulations in the COE approval of the Quarry Development Plan, the conclusive consistency determination, and on State permits, if required) that will apply to the quarry operation. Where State permits are not required, the COE is responsible for monitoring compliance with these stipulations and for enforcing them during operations, as necessary.

If the quarry site stipulations needed to ensure consistency with the ACMP are not met, or if the terms and procedures outlined in the LOA are not followed, the DGC may revoke the consistency determination for the quarry site.

EFFECTIVE DATE:

This agreement takes effect upon the date of the last signature below and will continue in effect until modified or revoked by agreement of both parties, or revoked by either party alone upon two months written notice.

25 JAN 90

William W. Kakel Date
Colonel, Corps of Engineers
District Engineer

Robert L. Grogan Date
Director
Division of Governmental Coordination

The following language will be used as a stipulation/justification in consistency reviews to reference the LOA.

1. A Letter of Agreement (LOA) between the Division of Governmental Coordination and the U.S. Army Engineer District, Alaska has been developed which provides guidance and establishes procedures for quarry site evaluation. When a quarry site is selected, the procedures in the LOA will be followed to ensure the consistency of quarry sites with the ACMP.

Condition 1 is necessary to ensure that all quarry site development and/or use associated with the water resources project is reviewed for consistency with the ACMP standards 6 AAC 80.040-.150, as provided under Section 307 of the Federal Coastal Zone Management Act.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503

IN REPLY REFER TO:

SE

SEP 26 1984

Colonel Neil E. Saling
Department of the Army
Alaska District Corps of Engineers
ATTN: Environmental Resources Section
Pouch 898
Anchorage, Alaska 99506

Dear Colonel Saling:

Your recent letter requested information on the occurrence of threatened and endangered species in the vicinity of a proposed small boat harbor at Anchorage Bay near Chignik, Alaska. Based on information currently available to us, no proposed or listed, threatened or endangered species administered by the U.S. Fish and Wildlife Service are present in or near the proposed project area.

Thank you for your inquiry and for your continuing regard for endangered species.

Sincerely,

Randy Bailey

Acting Assistant Regional Director

cc: WAES

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

October 16, 1984

Leroy L. Saage
U.S. Army Corps of Engineers
Alaska District
Pouch 898
Anchorage, Alaska 99504

Dear Colonel Saage:

This letter is in response to your letter (undated) requesting information regarding threatened or endangered species under the National Marine Fisheries Service's responsibility that may occur in the coastal vicinity of Chignik, Alaska.

NMFS bears responsibility for eight species of endangered whales which occur in Alaska waters. These are:

Blue - Balaenoptera musculus
Sei - Balaenoptera borealis
Fin - Balaenoptera physalus
Black Right - Balaena glacialis
Bowhead - Balaena mysticetus
Sperm - Physeter macrocephalus
Gray - Eschrichtius robustus
Humpback - Megaptera novaeangliae

Of these, all but the bowhead and sperm whale may be found in the coastal waters of the Northern Gulf of Alaska and along the southern coast of the Alaska Peninsula. It is unlikely that any of these species would be found within Anchorage Bay; however, we have no specific data for the Chignik area.

We have included a brief discussion of the occurrence of these endangered species and other marine mammals for your general interest (below).

Humpback whale - About 1,000 humpback whales (of a total world population of 6,000) inhabit the North Pacific. During the summer feeding season, they range widely from the Subarctic Boundary (ca. 42°N lat) north into the Bering Sea. The greatest population densities are reached in certain inshore waters, where the animals appear to be largely resident during the summer and autumn. Most Alaska humpbacks spend the winter around the Hawaiian Islands or along the west coast of central Mexico.

The main foods of humpback whales in southeastern Alaska are euphausiaceans (Euphausia pacifica), herring (Clupea harengus), and capelin (Mallotus villosus).

Gray Whale -
Gray whales are endemic to the North Pacific. The eastern Pacific population now numbers about 16,000 animals, whereas the western Pacific population is apparently on the verge of extinction. The eastern population spends the summer in the northern Bering and Chukchi seas, and migrates along the coast to winter grounds on the west coast of Baja California, where the calves are born.

Twice each year virtually the entire eastern Pacific population of gray whales passes along the outer coast -- mostly within 5 km of the beach. This would be the species most likely to be found near the Chignik area.

Fin whale -
This species ranges widely in offshore waters of the Gulf of Alaska, but we have no evidence that it occurs regularly in nearshore waters near Chignik.

The sei, blue, and sperm whales generally move in and out of the offshore areas seasonally.

The right whale may be resident in the Gulf of Alaska year round and may enter coastal waters frequently.

The bowhead whale has not been reported in the Gulf of Alaska.

Other marine mammals -
The beluga whale, killer whale, harbor porpoise, and Dall porpoise may be resident in the Gulf of Alaska year round, as is the sea otter. The harbor porpoise and sea otter inhabit coastal waters frequently.

Harbor seals and northern sea lions are found in shallow coastal waters of the Gulf of Alaska although sea lions may occasionally be found on the offshore fishing banks. These two species are probably present throughout the year.

Northern fur seals are probably near the coast in small numbers during most months of the year with population peaks occurring in November - December and in April - May - June, when they are migrating southward in winter and northward in spring. As many as half the Pribilof population may be in the Gulf of Alaska during spring migration.

Although the information is quite general, we hope it will be useful in the planning process.

Sincerely,

James H. Branka

for Robert W. McVey
Director, Alaska Region

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION

225A CORDOVA STREET
ANCHORAGE, ALASKA 99501
PHONE: (907) 276-2653

MAILING ADDRESS:
POUCH 7001
ANCHORAGE, ALASKA 99510

July 22, 1985

Re: 3440 (COE)

Harlan E. Moore
Chief, Engineering Division
US Army, Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Dear Mr. Moore:

Thank you for your letter of July 12, 1985 requesting a Determination of Eligibility on Site CHK-032. We have reviewed the documentation on the site and agree that the artifacts collected probably constitute the majority of the total assemblage. As such, there would be very little basis on which to determine the site eligible to the National Register. Therefore, we agree with the Alaska District's determination of Not Eligible for site CHK-032.

We look forward to working with you on projects like this in the future.

Sincerely,

Neil C. Johannsen
Director

Judith E. Bittner

By: Judith E. Bittner
State Historic Preservation Officer

DR:tls

STEVE COWPER, GOVERNOR

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

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NORTHERN REGIONAL OFFICE
675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 456-3084

REGISTERED MAIL
RETURN RECEIPT
REQUESTED

March 16, 1987

U. S. Army Engineer Dist., Alaska
Attn: Ms. Lizette Boyer
P.O. Box 898
Anchorage, AK 99506-0898

Dear Ms. Boyer:

SUBJECT: CHIGNIK SMALL BOAT HARBOR
STATE I. D. NO. AK870210-13A

The Division of Governmental Coordination (DGC) has completed the state's review of the U. S. Army Corps of Engineer's (COE) Draft Environmental Impact Statement (DEIS) for the Chignik Small boat Harbor.

The DEIS proposes four alternative sites for a protected harbor at Chignik, Alaska, a fishing and seafood processing community on the south shore of the Alaska Peninsula. Site No. 2 is the COE's preferred alternative.

The review was conducted for advisory comments under the Alaska Coastal Management Program (ACMP) and comments in accordance with the National Environmental Policy Act (NEPA). All comments received were based on the ACMP. The state has identified the following recommendations and information requirements which, if satisfied, would allow the activity to proceed in a manner consistent to the maximum extent practicable with the ACMP.

Department of Environmental Conservation (DEC) - DEC has no preferred alternative, but requires the following information:

1. Pg. EIS-32 - Circulation - DEC would like to see a study showing the optimal breach size of the breakwater (depth & width) which would allow for the best circulation and still provide adequate wave protection.

2. As this harbor will be a fish corridor, information concerning its flushing characteristics must be more

specific. Circulation/flushing characteristics should be guantified.

3. Pg. EIS-35 - Disposal Site 2 - DEC favors piping over trucking of dredge material to the site. Trucking involves double handling with increased chance of water quality degradation, and if utilized, it may require a primary disposal settling basin.

4. Pg. EIS-36 - Quarry Site - DEC will require an erosion/siltation control plan to be developed. This should demonstrate how the COE will limit the water quality degradation resulting from quarry site operation.

5. Where would a construction camp be located? How will the camp's water and septic service be provided? Plans will be required for DEC review and approval prior to construction.

6. What on-shore sanitary facilities would be provided for harbor users? Plans will be required for DEC review and approval prior to construction.

7. What will harbor fueling facilities consist of?

8. Solid waste will be generated during harbor construction and operation. How and where will this be disposed of? If a solid waste disposal site is planned, DEC will require that a solid waste disposal permit application be submitted for review during the permitting phase of the project.

9. How and where will petroleum wastes be contained and/or disposed of?

Department of Natural Resources, Division of Land & Water Management (DNR/DL&WM) - DNR/DL&WM indicated no preferred alternative, but requires the following information:

1. The tide and submerged land from mean high water seaward for 3 miles belongs to the State of Alaska. The party ultimately responsible for the operation and maintenance of the Chignik Small Boat Harbor should contact the DNR/DL&WM, information office (561-2020) for the appropriate information and/or applications if any portion on the project encompasses state owned tideland. This allows the state to ensure that the tideland involved in the project area is available and unencumbered.

Department of Fish and Game, Habitat Division (DFG) - Due to previous coordination with the COE, DFG has no major concerns about the information presented in the DEIS, and concurs with the COE's determination that Site 2 is the preferred alternative.

Bristol Bay Coastal Resource Service Area (BBCRSA) - The project would be located within the boundaries of the BBCRSA District Coastal Management program and would therefore be subject to the program's enforceable policies. BBCRSA concurs with the COE's determination that Site 2 is the most feasible alternative. Site 2 is also generally consistent with the BBCRSA Coastal Management Program.

DGC will conduct a conclusive consistency review on the Final Environmental Impact Statement once it is released.

Subsequently, when the project is ready for authorizations, DGC will conduct the state's review of the multiple federal and state agency permits required for project construction.

Thank you for the opportunity to review the DEIS.

Sincerely,

Louisa B. Rand

Louisa B. Rand
Project Coordinator

cc: Greg Curney
Department of Natural Resources

Tim Rumfelt
Department of Environmental Conservation

Wayne Dolezal
Department of Fish and Game

Sue Flensberg
Bristol Bay Coastal Resources Service Area

STEVE COWPER, GOVERNOR

OFFICE OF THE GOVERNOR

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REGISTERED MAIL
RETURN RECEIPT
REQUESTED

June 9, 1988

Mr. William D. Lloyd
Chief, Environmental Resources Section
U. S. Army Corps of Engineers
P.O. Box 898
Anchorage, AK 99506-0898

Dear Mr. Lloyd:

SUBJECT: CHIGNIK SMALL BOAT HARBOR
FINAL DETAILED PROJECT REPORT AND
ENVIRONMENTAL IMPACT STATEMENT
STATE I.D. NO. AK880419-19A

The Division of Governmental Coordination (DGC) has completed the state's review of the U. S. Army Corps of Engineers' (COE) Final Environmental Impact Statement (FEIS) for the Chignik Small Boat Harbor. Review of the Draft EIS (DEIS) was conducted in early 1987 under State I. D. No. AK870210-13A.

The FEIS was based on Site No. 2, a protected harbor at Chignik, Alaska, a fishing and seafood processing community on the south shore of the Alaska Peninsula.

The review was conducted for advisory comments under the Alaska Coastal Management Program (ACMP) and comments in accordance with the National Environmental Policy Act (NEPA).

Based on the review of the FEIS by the Alaska Departments of Natural Resources (DNR), Environmental Conservation (DEC), and Fish and Game (DFG) and the Bristol Bay Coastal Resource Service Area, the state concurs with your certification that the location of Site 2 is consistent with the ACMP. The FEIS adequately addresses the points raised by the ACMP reviewers during review of the DEIS.

A final coordinated consistency review will be conducted for this project at the permitting stage, once specific siting and design information is provided and when the City of Chignik has

submitted the appropriate permit applications and Coastal Project Questionnaire. The consistency review will consider the full scope of the project. The state permits subject to the review will include a DEC Section 401 Certificate of Reasonable Assurance and a DNR Tidelands Lease since site 1 is located on State owned tidelands. Please be advised that if the source of the fill material is state owned, a DNR Material Sale Permit will be also be needed.

Thank you for the opportunity to review the FEIS.

Sincerely,

Debra Oylear

Debra Oylear
Project Review Assistant

cc: Greg Curney
Department of Natural Resources

Tim Rumfelt
Department of Environmental Conservation

Wayne Dolezal
Department of Fish and Game

Sue Flensberg
Bristol Bay CRSA

U.S. EN. .ONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

MAY 3 1 19..

REPLY TO ATTN OF WD-136

Colonel Wilbur T. Gregory, Jr.
District Engineer
Alaska District
Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Dear Colonel Gregory:

The Environmental Protection Agency (EPA) has reviewed the Chignik, Alaska Small Boat Harbor Final Detailed Project Report (FDPR) and Final Environmental Impact Statement (FEIS). These documents present the final harbor plan that would provide protected moorage facilities for the local fishing fleet. Our review was conducted in accordance with the National Environmental Policy Act and our responsibilities under Section 309 of the Clean Air Act and Section 404 of the Clean Water Act.

We provided comments on the Draft EIS (DEIS) and expressed several environmental concerns. We were concerned primarily about the adverse impacts on the freshwater wetlands adjacent to site 2 and potential water quality impacts from the upland disposal of dredged material from the harbor.

Our DEIS comment letter pointed out that the sediments dredged from the harbor could be contaminated and could require confined disposal depending on their level of contamination. The testing requirements and confinement features would be more costly than the cost estimates presented in the DEIS. Since the DEIS indicates that site 2 would require more frequent dredging, these additional costs could affect the benefit/cost ratio for this alternative and affect the overall selection of a preferred alternative. Finally, we requested additional information on site 3 so that there would be a comparable level of detail for each alternative.

We recognize the need for this project. It will provide protected moorage facilities which will decrease vessel damage, transportation costs, and vessel operating expenses. However, we continue to have environmental concerns with the proposed action, construction of the harbor at site 2. Based on our review of the FDPR/FEIS, our concerns involve the wetlands adjacent to site 2 and the upland dredge disposal site features.

The alternate staging area design shown in Figure 9 of the FDPR/FEIS is environmentally preferable, compared to the "Selected Plan" shown in Figure 6. The alternate design would significantly reduce the project's impacts to the freshwater marsh and ponds adjacent to the proposed harbor. However, the

FEIS (page 42) states that this design is not recommended because final design of the float system may differ from that shown. We recommend the Record of Decision specify that the final float system will be designed so that access can be provided from the alternate staging area design. Because a practicable alternative exists that would minimize wetland impacts, we do not believe that the staging area depicted in the "Selected Plan" could receive a favorable Section 404(b)(1) evaluation.

We note that the upland disposal area for dredged material shown on Figure EIS-3 has not been designed for contaminated material. Contaminants could migrate from this type of disposal site via return effluent (during filling), runoff, or leaching through the unlined containment dike or underlying soil. If, in fact, only uncontaminated dredged material is placed in the disposal area, these processes should not result in adverse impacts. However, to the extent that future maintenance dredging includes contaminated material, degradation would occur. We recommend that the Record of Decision include a summary of the other Alaska Harbor test results referenced in the FEIS's Response #4 (page G-3) to the EPA comment letter on the DEIS.

If you have any questions about our review comments, you may contact Sally Brough of our Environmental Review Section at (206) 442-4012 or Brian Ross in our Alaska Operations Office in Anchorage at 271-5083.

Sincerely,

Robert S. Burd
for Director, Water Division

U.S. ENVIRONMENTAL PROTECTION AGENCY

ALASKA OPERATIONS OFFICE
Room E535, Federal Building
701 C Street, Box 19
Anchorage, Alaska 99513
Phone (907) 271-5083

September 28, 1988

Colonel William W. Kakel
District Engineer
U.S. Army Corps of Engineers
Alaska District
P. O. Box 898
Anchorage, Alaska 99506–0898

Dear Colonel Kakel:

Thank you for your letter of July 19, 1988 providing further information about the Chignik Alaska Small Boat Harbor Final Detailed Project Report and Final Environmental Impact Statement (FEIS). One issue remains in need of clarification. A portion of the overall project would be the responsibility of the local sponsor to construct and an individual Department of the Army permit would be required. It is my understanding that your staff plans to issue this permit based upon comments received on the EIS, without going out to Public Notice. Permits were recently issued in the same manner for the Saint Paul Island harbor project after finalization of that project's Environmental Assessment (EA). I understand that this process for issuing individual permits for local aspects of larger public works projects is based on Regulatory Guidance Letter (RGL) 88–9, dated July 21, 1988. I am concerned that the process established by RGL 88–9, as demonstrated by the two aforementioned projects, inadvertently precludes proper evaluation with respect to 404(b)(1) Guidelines compliance and preempts the options of the Environmental Protection Agency (EPA) for referral under the Section 404(q) Memorandum of Agreement or implementation of our 404(c) authority.

The RGL places a new burden on Corps of Engineers planning documents to be sufficiently detailed for specific permit review in addition to overall planning. Traditionally, such planning documents have been adequate to provide economic justification and to determine overall environmental acceptability. However, specific comments for minimizing actual project impacts often cannot be made until specific design information is available. The appropriate level of detail for final permit review has not always been available at the planning document phase.

This was the situation with the Saint Paul Island project. In that instance, even though there had been a substantial coordination process, some aspects of the project had been left unresolved. Since permits were issued directly following finalization of the EA, EPA did not have the opportunity to request permit conditions that may have further minimized the impacts of the project consistent with the 404(b)(1) guidelines.

The Chignik situation is similar. In our comments on the FEIS dated May 31, 1988, we noted that there was a practicable alternative to the "selected" staging area design (the portion of the project for which a Department of the Army permit is now proposed). We also stated our belief that the "selected" staging area design could not receive a favorable Section 404(b)(1) evaluation. Your letter of July 19, 1988 states that the alternative design is not recommended because the perimeter road may be needed for access to the float system and for safety and fire protection reasons. However, the float system design has not been finalized and I understand that it may differ from that shown in the FEIS. A different float system design need not require perimeter road access; similarly, an alternative having staging areas at both the north and the south ends of the marina should also provide for efficient safety and fire protection access. Finally, it is not completely clear that the proposed harbor perimeter access road would in fact have less impact on the adjacent coastal wetland than the alternative described in our EIS comments. In particular, a properly designed stream crossing by a north access road need not have an environmental effect on the wetland. It would seem that project elements such as the float system design should be finalized and a complete Guidelines evaluation of impacts performed prior to authorizing this private construction. We may therefore wish to request additional information, or suggest specific permit conditions or modifications, as the project approaches the construction phase.

EPA supports the Corps of Engineer's efforts to reduce paperwork and avoid unnecessary delays. However, in order to facilitate adequate Guidelines analysis, those features of public works projects for which the Corps of Engineers intends to issue private permits should be clearly described, based on final design, prior to authorization.

It may be beneficial for our respective agencies to discuss this issue further. Clarification of Alaska District policy in this regard would preclude similar confusing situations from arising in the future. In the meantime, we request that the Record of Decision for the Chignik harbor project specify that issuance of any individual permits associated with this overall project will be preceded by the normal Public Notice/public review process.

Please do not hesitate to contact me if you would like to discuss these comments, or have your Environmental Resources Section staff contact Brian Ross of my NEPA and Wetlands Review Team at the number given above.

Sincerely,

Alvin L. Ewing
Assistant Regional Administrator

cc: D. Davis, OWP
B. Burd, Region 10

U.S. ENVIRONMENTAL PROTECTION AGENCY

ALASKA OPERATIONS OFFICE
Room E535, Federal Building
701 C Street, Box 19
Anchorage, Alaska 99513
Phone (907) 271-5083

March 16, 1989

Colonel William W. Kakel
District Engineer
U.S. Army Corps of Engineers
Alaska District
P. O. Box 898
Anchorage, Alaska 99506-0898

Dear Colonel Kakel:

Thank you for your letter of November 15, 1988, clarifying issues that have been raised about the proposed Chignik Small Boat Harbor. The draft and final Environmental Impact Statements for the project were unclear as to which portions of the overall project would involve federal versus local sponsorship. EPA's concerns about the relationship of Regulatory Guidance Letter 88-9 to this project had to do with the portion that would be constructed under local sponsorship; we understood - incorrectly, it turns out - that this would include the staging area. Accordingly, we had anticipated providing the comments that follow regarding the need for chemical characterization of the Chignik sediments to the local sponsor as a part of our review of its permit application for that construction.

Chemical testing should be conducted wherever there is a reason to believe that sediments may be contaminated to a degree that would necessitate some form of restriction on disposal location, timing, or method. For example, we believe that this will be the case for maintenance dredging or other similar activities at most existing harbors and port facilities. However, baseline sediment data are either absent or extremely limited for existing facilities in Alaska. This accents the need to conduct baseline characterizations prior to or during construction of new facilities such as the Chignik Small Boat Harbor whenever possible.

Some of the material to be dredged during construction of the Chignik Small Boat Harbor basin will be used to construct the staging area. There is no reason to believe that this material presently contains chemical contaminants that would raise concern over its disposal in this manner. However, sediment that accumulates in the basin over time can be expected to become contaminated by a wide variety of organic and inorganic compounds that are associated with normal harbor activities. Therefore, it is important that the existing material be characterized chemically, as described below, in order to provide a baseline against which similar characterizations of future material from maintenance dredging can be compared. We anticipate that chemical characterization will be required prior to any future maintenance dredging, whether in-water or upland disposal is proposed. Substantial elevation over baseline in the level of contamination may indicate the need for more intensive testing, potentially including biological testing, in order to design acceptable dredging and disposal methods.

As noted in the enclosed memo (Enclosure 1), EPA is trying to coordinate an interagency workshop to address some of the issues surrounding the sorts of sampling and testing that are most appropriate for Alaskan projects. In the meantime, especially where baseline data are needed such as in the Chignik situation, we recommend that the Corps conduct (or require applicants to conduct) bulk sediment testing to include each of the parameters listed in Enclosure 2. Recommended test protocols and detection limits are also discussed in this enclosure. This information was developed for Puget Sound sediment testing, and we realize that some of it may not be included in the testing program we ultimately hope to develop with you for Alaska. However, the recommendations are appropriate for baseline testing in the interim and are less extensive than testing for the full range of EPA Priority Pollutants would be.

We have appreciated your attention to our concerns about the Chignik Small Boat Harbor project. Please contact me if there are any questions about these comments. We look forward to working together with your staff in increasing our attention to sediment management issues in Alaska.

Sincerely,

Gregory L. Kellogg, Acting
Assistant Regional Administrator

Enclosures

cc: William Lloyd, Environmental Resources
Robert Oja, Regulatory Branch
John Malek, Region 10

STEVE COWPER, GOVERNOR

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NORTHERN REGIONAL OFFICE
675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 456-3084

April 19, 1988

Mr. William D. Lloyd
Chief, Environmental Resources Section
U. S. Army Corps of Engineers
P.O. Box 898
Anchorage, AK 99506-0898

Dear Mr. Lloyd:

SUBJECT: CHIGNIK SMALL BOAT HARBOR
DETAILED PROJECT REPORT & FINAL EIS

The Division of Governmental Coordination (DGC) has received the Final Environmental Impact Statement (FEIS) prepared by the U. S. Army Corps of Engineers (COE). State I.D. No. AK880419-19A has been assigned to the state's review file on this project. Please refer to this number in any future reference to the project. Review of the Draft EIS (DEIS) was conducted in early 1987. under State I. D. No. AK870210-13.

Included in the FEIS was your consistency certification submitted for our consideration under Section 307(c) (3) (A) of the Federal Coastal Zone Management Act as per 15 CFR 930, Subpart D. It appears on page 62 of the FEIS.

DGC is conducting the state's review of the FEIS in order to provide comments in accordance with the National Environmental Protection Act (NEPA), and advisory comments pursuant to the Alaska Coastal Management Program (ACMP). The purpose of the advisory consistency review is to determine whether the state concurs with the applicant that the location of Site 2 is consistent with the ACMP. Reviewers can also determine whether the document adequately addresses points they raised during review of the DEIS. They can also identify information which will be required for the consistency review at the permit stage. A final coordinated consistency review will be conducted for this project at the permitting stage, after the Record of Decision on the FEIS, and once specific siting and design information is provided. The consistency review for permits is the appropriate stage for final technical design review comments.

NEPA comments should be clearly identified and separated from consistency comments.

Copies of the FEIS have already been distributed by your agency consequently, DGC will not distribute additional copies. A copy of the distribution list can be found on pages 7-1 through 7-3 of the report. If reviewers cannot locate the copy sent to their agency or if another copy is needed, they should contact Lizette Boyer, COE at 753-2640 to obtain one. A copy is also available for review at DGC.

Thank you for your cooperation in this review process.

Sincerely,

Pat Miller

for: Debra Oylear
Project Review Coordinator

Enclosure

cc: Distribution List

[613] Ms. Judith Bittner, Department of Natural Resources Division of Parks, Anchorage
[1350] Mr. Tom Brooks, Manager, Civil Engineering Alaska Railroad Corporation, Anchorage
[1220] Ms. Veronica Clark, Department of Natural Resources, Anchorage
[3] Mr. Bob Flint, Department of Environmental Conservation, Anchorage
[1072] Mr. Neil Johannsen, Department of Natural Resources Division of Parks, Anchorage
[188] Ms. Jan Mills, Office cf Management and Budget, Juneau
[856] Mr. Donald Neilsen, Anchorage
[303] Mr. Michael O'Brien, Department of Transportation and Public Facilities, Anchorage
[591] Ms. Deborah Tennyson, Dillingham
[371] Mr. Lance Trasky, Department of Fish and Game, Anchorage

STATE OF ALASKA

OFFICE OF THE GOVERNOR

DIVISION OF GOVERNMENTAL COORDINATION

STEVE COWPER, GOVERNOR

SOUTHCENTRAL REGIONAL OFFICE
2600 DENALI STREET
SUITE 700
ANCHORAGE, ALASKA 99503-2798
PHONE: (907) 274-1581

PROJECT INFORMATION SHEET

PROJECT TITLE: Chignik Small Boat Harbor Detailed Project Report & Final EIS

STATE I.D. NUMBER/REVIEWING OFFICE: AK880419-19A

DGC CONTACT: Debra Oylear

APPLICANT CONDUCTING ACTIVITY: CDE

DIRECT FEDERAL ACTION: YES ✓ NO ___

REVIEW TYPE: CONSISTENCY ADVISORY ✓ ANILCA ___ OCSLA ___ NEPA ✓ OTHER ___

ACTIVITY TYPE:

ARMED FORCES ACTIVITIES ___
COMMERCIAL/TYPE ___
LAND MGMT. PLAN ___
MINING: HARDROCK MINING ___
PLACER MINING ___
OFFSHORE MINING ___
OIL AND GAS ___
OTHER ___
PUBLIC UTILITIES/FACILITIES ✓
PRIVATE RESIDENTIAL ___
TIMBER ___

FISHERIES PRODUCTION:
GENERAL ___
HATCHERY ___
REMOTE RELEASE ___
FISHERIES FARMS:
FINFISH ___
SHELLFISH ___
SEA VEGETABLES ___
FISHERIES ENHANCEMENT ___
FISHERIES PROCESSING ___

PROJECT LOCATION:

NEAREST COASTAL DISTRICT: BBCRSA

PROJECT INSIDE THE DISTRICT BOUNDARY: YES ✓ NO ___

DISTRICT PLAN APPROVED: YES ✓ NO ___ PENDING ___

REVIEW MILESTONES: DAY 1 April 19, 1988

REVIEW SCHEDULE: 15-Day ___ 30-Day ___ 50-Day ___ OTHER ✓

REVIEWER REQUEST FOR ADDITIONAL INFORMATION BY: NA

COMMENTS DUE TO DGC BY: May 18, 1988

NOTIFICATION TO APPLICANT BY: May 23, 1988

DECISION DEADLINE: NA

CITY OF CHIGNIK
P. O. Box 110
Chignik, Alaska 99564

RESOLUTION 94-06

A RESOLUTION CERTIFYING AN AGREEMENT TO UNDERTAKE AN OBLIGATION

WHEREAS, The community at Chignik needed and continues to need a harbor, and

WHEREAS, The community at Chignik formed the City of Chignik to be the local sponsor with the U.S. Army Corps of Engineers (particularly its Alaska District) to decide the feasibility of a harbor and construct a harbor within the city limits of the City of Chignik, and

WHEREAS, This project involves the use of public funds that go to the U.S. Army Corps of Engineers (hereinafter the "Corps"), and

WHEREAS, this use obligates the sponsor to inform its citizens and their representatives about the financial and performance obligations that are an integral part of the initial project management plan ("IPMP") which is a part of the Feasibility Cost Sharing Agreement ("FCSA"), and

WHEREAS, the Council of the City of Chignik recognizes the following:

1. That this agreement specifies and schedules the tasks and the source and disposition of funds required of all parties to complete the feasibility phase of a study for potential construction of a harbor here. Both parties recognize that much of this work has been done under a previous funding regime, yet this work must be brought current.

2. That under the previous and current funding regime that it is highly probable that the harbor will be:
   a. Located at site 2,
   b. Be designed for about seventy boats,
   c. Encompass a 4.4 acre mooring basin,
   d. Have a 2.6 acre entrance and access channel area, and,
   e. Cost about $10 million in 1988 dollars.

3. That all of the work will be identified and checked by the Corps and that most of the work will be done by the Corps.

4. That the elements of the feasibility study are:
   a. The production of an approved environmental impact statement,

b. That an economic study will be produced and that further work on the project will be decided largely by a favorable national economic benefit--cost ratio.

c. That various harbor and approach depths will be explored and this exploration will recognize that the economic optimum depth (and design depth) may not guaranty the safety of all vessels within the harbor at all times and under all conditions.

d. That the project formulation section of the Alaska District will coordinate and design, oversee, and monitor the feasibility cost sharing agreement and all appendices, particularly the IPMP.

e. That the project formulation section of the Alaska District will determine such things as:
   1) The optimum size of the harbor,
   2) The optimum depth of the harbor,
   3) The configuration of the harbor,
   4) The site of the harbor,
   5) The nature of the need in terms of the sizes and requirements of the user vessels

f. That the project formulation section of the Alaska District will monitor the progress of the project and report on the progress of the project.

g. That the soils and geology studies will be done per the direction and specifications of the Corps. The Corps will review and approve all soils and geology work.

h. That the cost engineering branch will produce the cost estimates for the harbor per its proprietary methodology.

i. That the Corps Real Estate Division will set and approve the real property requirements for the project site.

j. That the programs and project management division will participate in all meeting and reporting activities involving the project.

k. That the City of Chignik will:
   1) Update socioeconomic data,
   2) Describe existing and prospective conditions of the site, community, users, and vessels. This will be done per a survey developed and approved by the Corps,

3) Identify current and prospective shipping practices,
4) Update the demographic, land status, economic, business, and allied data per a survey developed by the Corps,
5) Report on its funding and its tasks to the Corps,
6) Engage the State of Alaska Department of Transportation and Public Utilities to provide funding and hydraulic and site analysis tasks,
7) Prepare a financing plan,
8) Participate in public meetings, project meetings, committees, and negotiations with all parties involved in this project,
9) Assist with the preparation of documents and reports for and about this project.

1. That the sponsor will prepare written material in the format acceptable to the Corps.

NOW THEREFORE BE IT RESOLVED that by this resolution the Council of the City of Chignik recognizes the stated performance and funding obligations of each party, and

BE IT FURTHER RESOLVED that the IPMP signed on April 20, 1994, is an obligation of the City of Chignik, and

BE IT FURTHER RESOLVED that per the authorization for Donald J. Braun, City Administrator, to sign the required documents originally given in a special meeting of this city council in March, 1994, is recognized and all acts previously taken are hereby ratified and approved.

PASSED AND APPROVED by a quorum of the Council of the City of Chignik this sixth day of May, 1994.

Richard J. Sharpe, Mayor

ATTEST:

Leon E. Knowles, City Clerk