DOCUMENTS ON DISC

U.S. Army Corps of Engineers, Alaska District, *Department of the Army Permit Evaluation and Decision Document* - *Application No. POA-2003-502-N* (August 10, 2007).

U.S. Army Corps of Engineers, Alaska District, *Department of the Army Permit, Port of Anchorage, POA-2003-502-N* (August 10, 2007).

U.S. Army Corps of Engineers, Alaska District, *Public Notice of Permit Application* (19 January 2006).

EXHIBIT INDEX

Exhibit	Description
A	*Final Report of the Master Plan* for the *Regional Port of Anchorage* (September 1999) (excerpts)
B	James MacPherson, *Huge port expansion proposed,* Alaska Journal of Commerce Online, Apr. 8, 2002
C	Tim Pryor, *Sheffield considered for port job,* Anchorage Daily News, April 30, 2001, at B-3; Sarana Schell, *Port orientation,* Anchorage Daily News, June 20, 2001, at E-1
D	Associated Press, *Port of Anchorage's Top Engineer to Quit – Richard Burg says he couldn't support city's new expansion plan*, Anchorage Daily News, June 18, 2002, at B3
E	Letter from Dennis Nottingham, President, PND Engineers, Inc. to To Whom It May Concern, (Dec. 28, 2005)
F	Municipality of Anchorage, Assembly Information Memorandum, AIM No. 105-2007 (Meeting Date: Nov. 27, 2007)
G	Letter from James W. Balsiger, NMFS Administrator, Alaska Region to Colonel Timothy J. Gallagher, Alaska District (June 1, 2005)
H	Letter from Ann G. Rappoport, Field Supervisor, USFWS to Colonel Timothy J. Gallagher, Alaska District (June 6, 2005)
I	Letter from Robert D. Mecum, Acting Administrator Alaska Region, NMFS to Colonel Timothy J. Gallagher, Alaska District from (Mar. 22, 2006)

J Letter from Ann J. Rappoport, Alaska Field Supervisor, USFWS to Colonel Timothy J. Gallagher, Alaska District (Mar. 17, 2006)

K Letter from Heather Dean, Environmental Scientist, EPA to Ryan H. Winn, Project Manager, Alaska District (Mar. 22, 2006)

L Letter from Bob Shavelson, Executive Director, Cook Inletkeeper to Timothy J. Gallagher, Alaska District Colonel (Mar. 22, 2006), and Letter from Bob Shavelson, Executive Director, Cook Inletkeeper to Colonel Kevin J. Wilson, Alaska District (June 5, 2007)

M Ports Committee of the Technical Council on Lifeline Earthquake Engineering, ASCE, Technical Council on Lifeline Engineering Monograph No. 12, *Seismic Guidelines for Ports* (March 1998)

N Lachel & Associates, *Port of Anchorage Potential Expansion Project Open-Cell Sheet Pile Design Concept Independent Technical Review* (August 2002) (excerpts)

O Moffat & Nichols Engineers, *Port of Anchorage Expansion Project Review of Alternative Structural Concepts* (October 31, 2002) (excerpts)

P Letter from David R. Chapman, Lachel & Associates to Duane Anderson, Chief Structure Engineer, R & M Consultants, Inc. (Nov. 18, 2002)

Q MOA Geotechnical Advisory Commission Resolution No. 2004-01 (March 30, 2004)

R Letter from Mark R. Musial, Chair, Geotechnical Advisory Commission, Municipality of Anchorage to William J. Sheffield, Director, Port of Anchorage (Aug. 15, 2005)

S POA, *Port of Anchorage Geotechnical Process Port of Anchorage Intermodal Expansion Project* (March, 2006) (without attachments)

T POA, *Summary of Geotechnical Analysis Port of Anchorage Intermodal Expansion Mayor's Blue Ribbon Commission* (June 29, 2004) (Attachment A to Exhibit S, *Port of Anchorage Geotechnical Process Port of Anchorage Intermodal Expansion Project* (March, 2006))

U Letter from Kevin Bruce, Port of Anchorage Director of Facilities Development to Mark Musial, Chairman, Geotechnical Advisory Commission, Municipality of Anchorage (Nov. 2, 2006)

V Terracon, *Intermodal Expansion Port of Anchorage Open Cell and Pile*

Supported Deck Wharf Structures FLAC Analysis for 1964 Mega Earthquake, Project 70045006.002 (Apr. 5, 2005)

W ERDC, *Port of Anchorage Expansion Project 35 % Design Review Prepared for the U.S. Army Engineer District, Alaska* (Revised 22 December 2006)

X Email from Mike Frank, Trustees for Alaska to Ryan H. Winn, Alaska District POA (Dec. 3, 2007; 10:43 a.m.) and Email from Ryan H. Winn, POA to Mike Frank, Trustees for Alaska (Dec. 4, 2007, 6:37 p.m.)

Y Email from Daniel E. Yuska, Jr., Environmental Protection Specialist, MARAD, to Brian K. Lance, NMFS, cc Alaska District's Ryan Winn, Project Manager, US Army Corp of Engineers (Feb. 1, 2007; 15:40:16 -0500)

Z Letter from Robert Mecum, Acting Administrator, Alaska Region of National Marine Fisheries Service to Colonel Kevin J. Wilson, US Army Corp of Engineers, Alaska District (Mar. 5, 2007)

AA Letter from James W. Balsiger, Administrator, Alaska Region of National Marine Fisheries Service to Michael Carter, MARAD (Apr. 7, 2005).

BB Letter from Ryan H. Winn, Project Manager, U.S. Army Engineer District, Alaska to Kevin Bruce, Deputy Director, Port of Anchorage (undated)

CC Tim Bradner, *Lawmakers cringe over governor's deep budget cuts - Vetoes trim $231 million from State's capital budget,* Alaska Journal of Commerce (July 8, 2007)

DD Email from Diane Carlson, Project Manager, Anchorage Port Expansion Team, to Ryan H. Winn, U.S. Army Corps of Engineers Alaska District (Jan. 31, 2007, 1:11 PM) (including Exhibit EE below, PND Engineers, Inc., *Cost Comparison – Page 1 – Prepared by: CDC*)

EE PND Engineers, Inc., *Cost Comparison – Page 1 – Prepared by: CDC*

FF Email from Diane Carlson, Project Manager, Anchorage Port Expansion Team to Ryan H. Winn, U.S. Army Corps of Engineers Alaska District (Jan. 31, 2007, 4:22 PM)

GG Email from Alaska District's Dennis J. Blackwell to Alaska District's Andrea B. Elconin and Alaska District's Ryan H Winn (May 15, 2007 10:36 AM)

HH Letter from Kevin Bruce, Director of Facility Development, Port of Anchorage, to Ryan H. Winn, Project Manager, Department of the Army, U.S. Army Engineer District, Alaska (Sept. 25, 2006) (excerpts)

II Anchorage Port Expansion Team, Techicon Infrastructure Consultants, *Port of Anchorage Marine Terminal Redevelopment*, Project No.: 6508.014 (July 2, 2004)

JJ *Poart [sic] of Anchorage Expansion Comparison of Sheet Pile vs. Pile Supported Construction Based on an Estimate by Tech Icon completed in 2004 and updated with unit pricing.*

KK *Abstract of Bids/Offers - 2007 Marine Terminal Redevelopment - Solicitation No.: 4406-2-S72 – Closing Date and Time: 2:00 P.M. 14 August 2007*

LL ICRC Anchorage Port Expansion Team, PND Engineers, Inc., *Port of Anchorage Expansion Project September 2006 – Anchorage, Alaska - South Extension Drawings - 35% Drawings* (September 6, 2006) (excerpts)

MM Anchorage Port Expansion Team, *Port of Anchorage Marine Terminal Expansion Project Design Alternative Selection Process Presentation* (May 5, 2005)

NN *Request for a Letter of Authorization to Allow Incidental Take of Marine Mammals during Phase II Construction Activities Associated with the Port of Anchorage Marine Terminal Development Project January 1, 2007 - October 31, 2012 (May 2006),* Attachment A (excerpts)

OO Letter from Garth K. Howlett, Senior Engineer, PND Engineers, Inc. to Chuck Casper, Project Manager, Integrated Concepts & Research Corp. (July 17, 2007)

PP Email from Alaska District’s Ryan H. Winn to Trustees for Alaska Mike Frank (Aug. 31, 2007, 12:39 P.M.) and Email from Trustees for Alaska Mike Frank to Alaska District's Ryan H. Winn (Sept. 5, 2007, 1:47 P.M.)

QQ Emails from Phil Brna, USFWS to Ryan H. Winn, Alaska District (Aug. 9, 2007, 9:37 a.m. and 4:23 p.m.)

RR Letter from William J. Sheffield, POA Port Director to Brigadier General John W. Peabody, U.S. Army Corps of Engineers, Pacific Ocean Division POD HQ (May 21, 2007)

September 24, 1999

Mr. Richard Burg, P.E.
Assistant Port Director
Port of Anchorage
2000 Anchorage Port Road
Anchorage, Alaska 99501

PORT OF ANCHORAGE MASTER PLAN – FINAL REPORT

Dear Mr. Burg:

We at VZM/TranSystems are pleased to present this Final Report of the Master Plan for the Regional Port of Anchorage. The report includes an Executive Summary, which presents a brief overview of the scope, methods and findings of the Master Plan. Detailed information and recommendations for each major element of the study is presented in the body of the report.

On behalf of our excellent team of engineering and economic specialists, we greatly appreciate the strong participation and leadership provided by Port staff, which added both to the value of the study, and to the enjoyment of the process. We also wish to acknowledge the comprehensive participation of Port stakeholders throughout the study. These included Port tenants, neighbors, municipal, ARRC and military representatives who offered their valuable time and guidance with obvious enthusiasm for the future success of the Port.

As we enter the new millennium, we look forward to working with you over the years to assure that the future will unfold as successfully as possible for the Port of Anchorage. This Master Plan will serve as a road map guiding the Port toward long-term success and supporting the growth of regional, Alaskan and national economic vitality.

Sincerely,

David Vandeveer
Project Manager
Vice President of Maritime Planning

DV/cjm
g:\general\980730\final report 9-24-99\letter.doc

EXHIBIT A

EXECUTIVE SUMMARY

Master Plan Fact Sheet

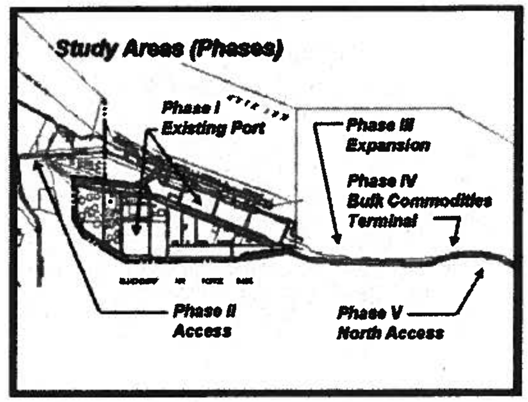
The Regional Port of Anchorage is a key transportation asset for Alaska. To maintain this vital resource and to accommodate new growth, the Port must continue to respond to existing needs as well as changing market conditions.

To meet this challenge, the Port of Anchorage commissioned a team of maritime and marketing experts, led by VZM/TranSystems, to develop this Master Plan. This Master Plan study envisions a phased development to accommodate the Port's existing and future users through the year 2020.

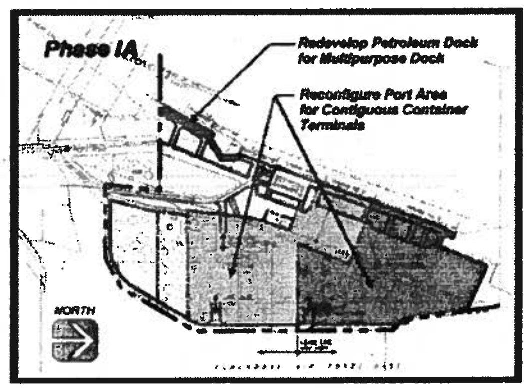
Key Findings:

- The Port of Anchorage is Alaska's Regional Port, serving 80% of the State's population and contributing an estimated $725 million annually to Alaska's economy.
- In 1998, the Port of Anchorage throughput included 1.5 million short tons (360,000 TEU's) of containerized cargo. The medium forecasts for containerized cargo is equivalent to a compound annual rate of 2.5%.
- Market opportunities include growth in domestic and international container traffic, automobile and bulk cargoes as well as cruise activities.
- Recommended improvements include enhancement and reconfiguration of existing facilities, redevelopment of a petroleum dock into a multipurpose dock, an increase in available draft at the Port, as well as the phased development of container and bulk facilities at the North Tidelands area.
- Landside access improvements must be made by state and local transportation agencies to safely and efficiently accommodate over 1,000 design hour vehicles by the year 2020.

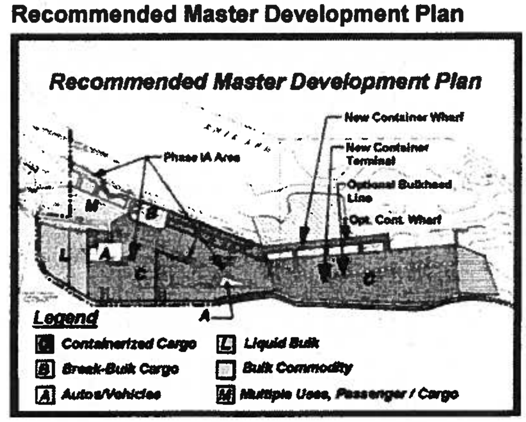
Master Plan Study Areas (Phases)



Recommended Phase IA



Recommended Master Development Plan



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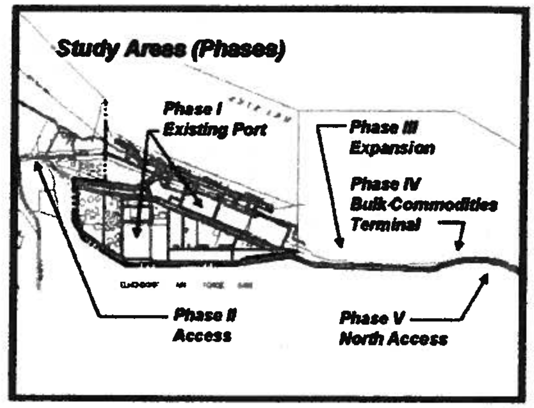
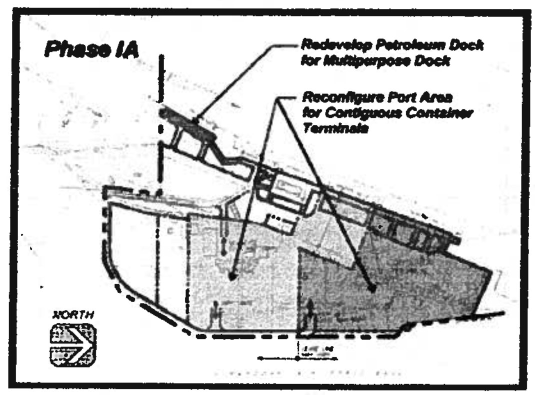
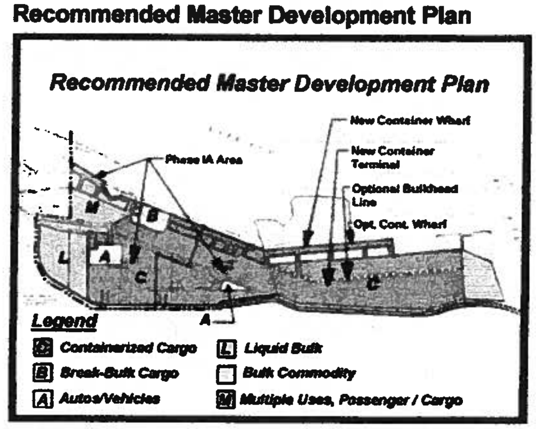


Recommended Phase IA



Recommended Master Development Plan



Overview

The Regional Port of Anchorage represents the major gateway for Alaska's waterborne commerce and plays a vital role in the regional economy. The Port's influence is felt throughout the locality, the State, and the Pacific Northwest. The Port's steady growth though the last decade is expected to continue into the next century. However, the Port is also faced with decisions that affect the ability to capitalize on new opportunities. In response, the Port commissioned a team of maritime planning specialists, led by VZM/TranSystems, to undertake this Master Plan.

The goal of this Master Plan is:

To provide a market driven Master Plan through the year 2020 for the Regional Port of Anchorage which will guide a pragmatic, environmentally sound program to stimulate and accommodate economic development, employment opportunities and an efficient transportation element serving Alaska.

This Master Plan consists of four major elements organized in the following manner:

- Strategic Marketing Plan
- Facilities Plan
- Access Plan
- Implementation Plan

The methodologies, findings and recommendations of each element are presented in greater detail within the body of the Final Master Plan Report. A brief overview of the key issues of each major element is presented in this Executive Summary.

Strategic Marketing Plan Summary

The Strategic Marketing Plan provides a snapshot of the existing conditions and describes a marketing strategy to use as a guide for the next 20 years.

The state has experienced an annual growth rate of 1.5 percent annual since 1990. The University of Alaska Institute of Social and Economic Research (ISER) projects population growth rates through 2025 of 0.5 percent for a low-growth scenario, 1.4 percent for a medium-growth scenario, and 2.4 percent for a high-growth scenario. These population growth rates have been used to develop forecasts for inbound cargo movements that are driven mainly by population growth.

The Port of Anchorage (POA) serves about 80 percent of the state's population. It is the dominant terminal for inbound and outbound containerized freight in Alaska. Most of this freight originates in Tacoma, Washington, which is the terminal for both Totem Ocean Trailer Express, Inc., and Sea-Land Service Inc. The POA accounts for the largest volume of refined petroleum imports in Alaska and is an exporter of refined petroleum products. The Port of Valdez is the largest port in Alaska in terms of tonnage, due to crude oil exports. The Port of Seward is the primary port for bulk exports of coal and forest products from Interior Alaska. The Port of Homer currently ships more forest products than any other port in Southcentral Alaska. The Port of Whittier serves as an ice-free port for fish and general freight by way of two commercial barge carriers. In the past, it also had several summer calls by major cruise ship lines.

Approximately 1.9 million short tons (ST) of inbound domestic cargo and 0.6 million ST of inbound foreign cargo moved through the Port in 1997. In the same year, outbound cargo totaled about 0.8 million ST, for total cargo volumes of about 3.3 million ST. Total cargo tonnage decreased to 2.9 million ST in 1998 because of an expansion of in-state refining capacity and a subsequent 25 percent decrease in petroleum imports through the POA. The decrease in petroleum imports resulted in an 11 percent decrease in total cargo tonnage, even though general cargo increased by 4.1 percent between 1997 and 1998.

Total cargo tonnage has increased about 12 percent in the past 5 years (1993-1998), an annual growth rate of about 2.4 percent. Tonnage for domestic vans, flats, and containers has grown approximately 10 percent in the same time, an annual growth rate of about 1.9 percent.

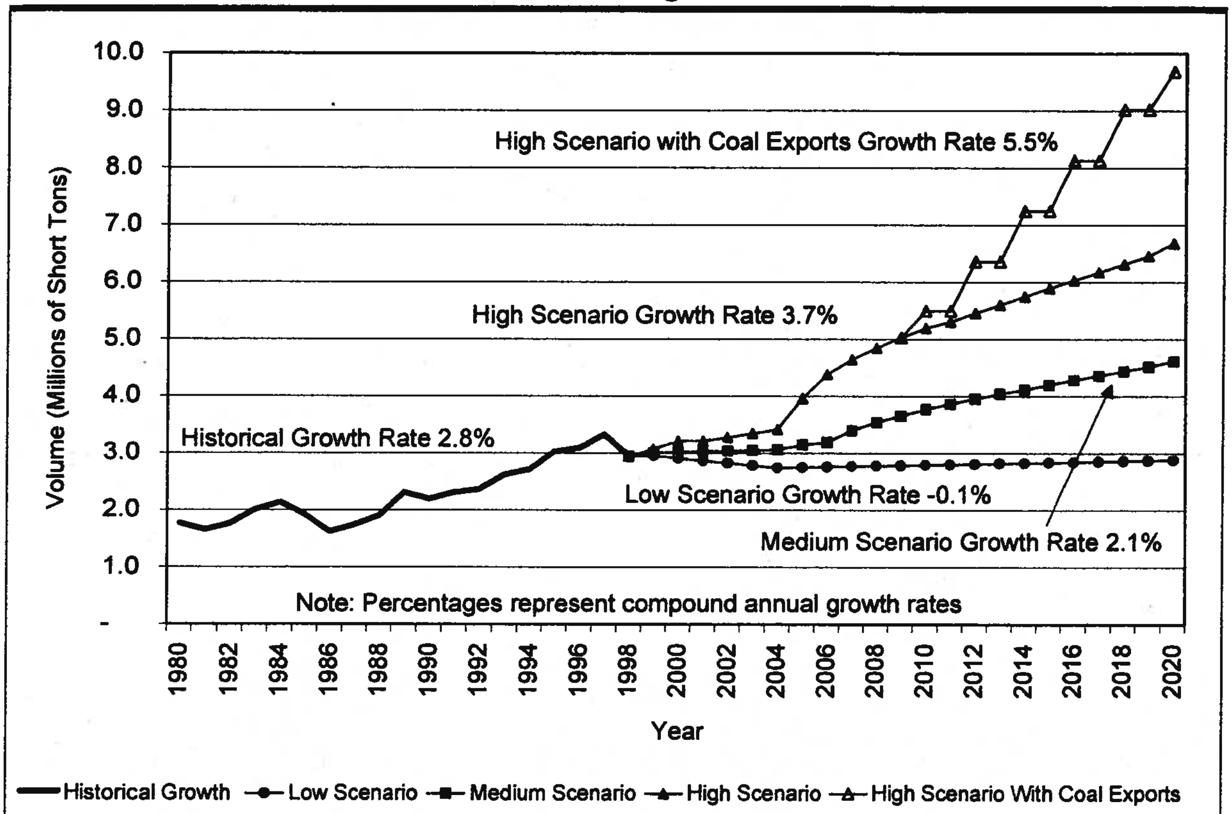
A number of opportunities may emerge in the future and affect cargo volumes through the POA. These include:

- Transshipment of containers for both domestic and international cargoes may increase cargo volumes.
- Bulk- coal-carrying ships configured to carry containers (conbulkers), for the backhaul leg of the Asia-to-Anchorage trip could positively affect international cargo volumes at POA.
- The emerging role of Anchorage International Airport (AIA) as a hub for air cargo shipments between Europe, the U.S., and Pacific Rim countries will require maintaining inventories in these distribution centers using ocean carrier delivery from the Lower 48 and Asia.
- Cargo flows that will emerge when new international distribution facilities are created in Anchorage and the planned seafood processing plant becomes operational will begin to generate the type of international cargo flows that can justify direct service.
- Value-added forest products such as containerized log homes are another possible cargo that could use liner service.
- There may be a market for smaller U.S.-flagged cruise vessels to use Anchorage as a homeport because of its excellent airport connections.
- Anchorage could become the center for expedition-like seasonal Arctic cruises.
- Future coal volumes could increase and the opportunity exists to accommodate some of these volumes in Anchorage.
- If coal exports move through a POA facility and the facility is able to accommodate more than one type of product, other dry-bulk commodities might become economically viable for export.
- A North Tidelands facility with an accompanying north access route to Anchorage military bases could offer a safe, cost-effective port for munitions shipments to these military bases.

- A bulk export facility could also provide a seasonal, full-tide barge dock for customers.

Figure ES-1 shows the total cargo volumes projected to move through the POA during the next 20 years. Two high-case forecasts are represented. One is based on the assumption that coal will not be accommodated at Anchorage. The second assumes that a coal export facility producing 3.1 million tons per year will be developed at the North Tidelands in the POA. The projected reduction in petroleum cargoes moving across the docks at the POA will result in total tonnages stabilizing or even declining for a few years before resuming the historic growth pattern.

Figure ES-1: Historical and Forecasted Total Cargo Volumes for the Port of Anchorage, 1980–2020



In addition, the following chart, Figure ES-2, illustrates a summary of the medium forecast for each commodity type in thousands of units per year for the same 20-year period. The medium forecast was used to determine the future needs for the Port of Anchorage over the course of that time frame.

Figure ES-2: Summary of Medium Forecast (in units per year in thousands)

Commodity Type	Units in 1,000's	1998	2005	2010	2020	Equivalent CAGR
Container	Short Tons	1,572	1,906	2,139	2,697	2.5%
Container	TEU's	359	449	520	687	3.0%
Break-Bulk	Short Tons	-	15	30	45	7.6%
Autos/Vehicles	Units	37	44	49	62	2.4%
Liquid Bulk	Short Tons	1,280	1,120	1,489	1,742	1.4%
Dry Bulk	Short Tons	96	106	113	130	1.4%
Passenger	Passengers	13	4	14	27	3.4%

Coal exports could be the catalyst needed for the POA to develop its potential for cargo transshipment and distribution, building on its locational assets and a mutually beneficial relationship with the AIA global air cargo hub. It should be recognized, however, that the coal exports shown for the POA, and other bulk commodity exports, could move through other ports if those ports build the necessary infrastructure to handle the projected volumes.

The marketing strategy presented for the POA depends upon development and promotion of a highly efficient facility with improved access to the state's principal highway and rail arteries. The POA and others must continue to support development of an intermodal system that achieves that goal and accommodates all users. If sufficient coal export volumes are routed through the POA, the potential exists for direct container service from Asia and transshipment of additional cargo. This opportunity could bring significant benefit to the Municipality of Anchorage and the state as a whole. The POA should work with other organizations in pursuit of this goal. A coal export facility at the North Tidelands would also benefit other potential export commodities, and the POA should support efforts by these industries to participate in global markets. The POA should develop a multipurpose dock suitable for passenger movements and participate with economic development agencies to market this facility to expedition cruise operators and other potential users.

Facilities Plan Summary

The Facilities Plan for the Regional Port of Anchorage began with an assessment of the existing marine terminals and facilities in operation during 1998. The assessment is based on an inventory of the existing maritime facilities in operation as of December 1998. Both Port of Anchorage property and non-Port of Anchorage properties are included in the inventory, **however the focus of this Master Plan is on the Port-owned areas.** The non-Port of Anchorage facilities are included in the inventory as a means of providing a comprehensive understanding of the maritime activities in Anchorage.

The following Figure ES-3, summarizes the approximate acreage, by cargo type (including passenger/cruise use), based on Port of Anchorage and Non-Port of Anchorage property:

Figure ES-3: Summary of Inventory of Existing Facilities

Cargo / Use Type	Port of Anchorage Land - in Approximate Acres	Non-Port of Anchorage Land - in Approximate Acres
Container	82.7	9.3
Break-Bulk	12.1	15.8
Autos/Vehicles	5.0	0.0
Liquid Bulk	19.9	52.1
Dry Bulk	0.0	6.8
Passenger	0.4	0.0
Intermodal Rail	0.0	27.4
Total	**120.1**	111.4

Note :
1. Totals do not include internal Port circulation areas of approximately 15%

Utilizing the Inventory data, we analyzed the throughput capacities of each terminal by cargo type using VZM/TranSystems' computerized cargo-handling models. These models analyzed containerized cargo, break-bulk/neo bulk, automobiles, liquid bulk, dry bulk and passengers/cruise activities. The models compared the following six key facility components that are related to maritime terminal throughput capacity:

- Vessel arrival and berth availability.
- Cargo transfer at the wharf apron.
- Apron-to-storage transfer.
- Storage yard and dwell time.
- Storage-to-inland transfer.
- Gate processing.

The models were applied to each terminal to identify the average "maximum practical capacity" for each terminal cargo type. **The term "Maximum Practical Capacity" (MPC) refers to estimated throughput volumes that are at the high end of a realistic operating scenario. However, operations at MPC may be uneconomical or unsafe. Therefore, for planning purposes, we use the "Sustainable Practical Capacity" (SPC) throughput, which is factored at approximately 75%-85% of the terminal's MPC.**

Each model also has the ability to utilize monthly throughput data to identify peaking characteristics and other requirements for berthing, storage and retrieval systems that are typical of modern container, break-bulk/neo bulk, automobiles, liquid bulk and dry bulk facilities. Given the Port of Anchorage's unique environment, i.e., ice conditions, extreme high and low tides, etc., specialized seasonality and operational peaks (that are typical of all maritime-related businesses) were directly incorporated into each model.

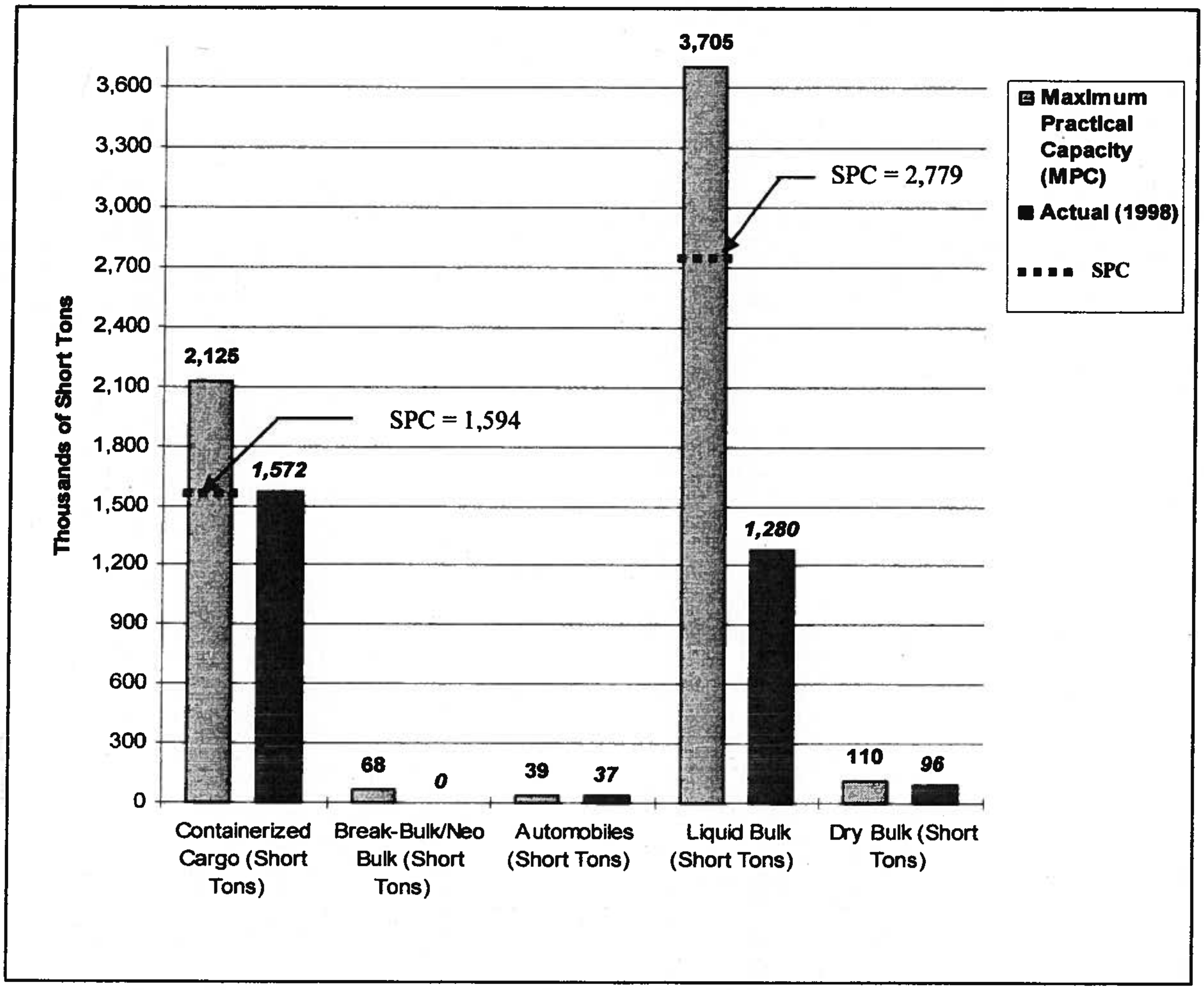
Summaries of the capabilities for each cargo type are presented in Figure ES-4

Figure ES-4: Summary of Throughput Capacity Analysis – By Cargo Type

Commodity Type	Maximum Practical Throughput (MPC)	Units
Containerized Cargo	2,125,043 (485,170)	Short Tons/ (TEU's)
Break-Bulk / Neo Bulk Cargo	68,079	Short Tons
Automobile Cargo	39,281	Autos/Year
Liquid Bulk Cargo	3,704,835	Short Tons
Dry Bulk Cargo	107,817	Short Tons
Passenger / Cruise	17,354	Passengers

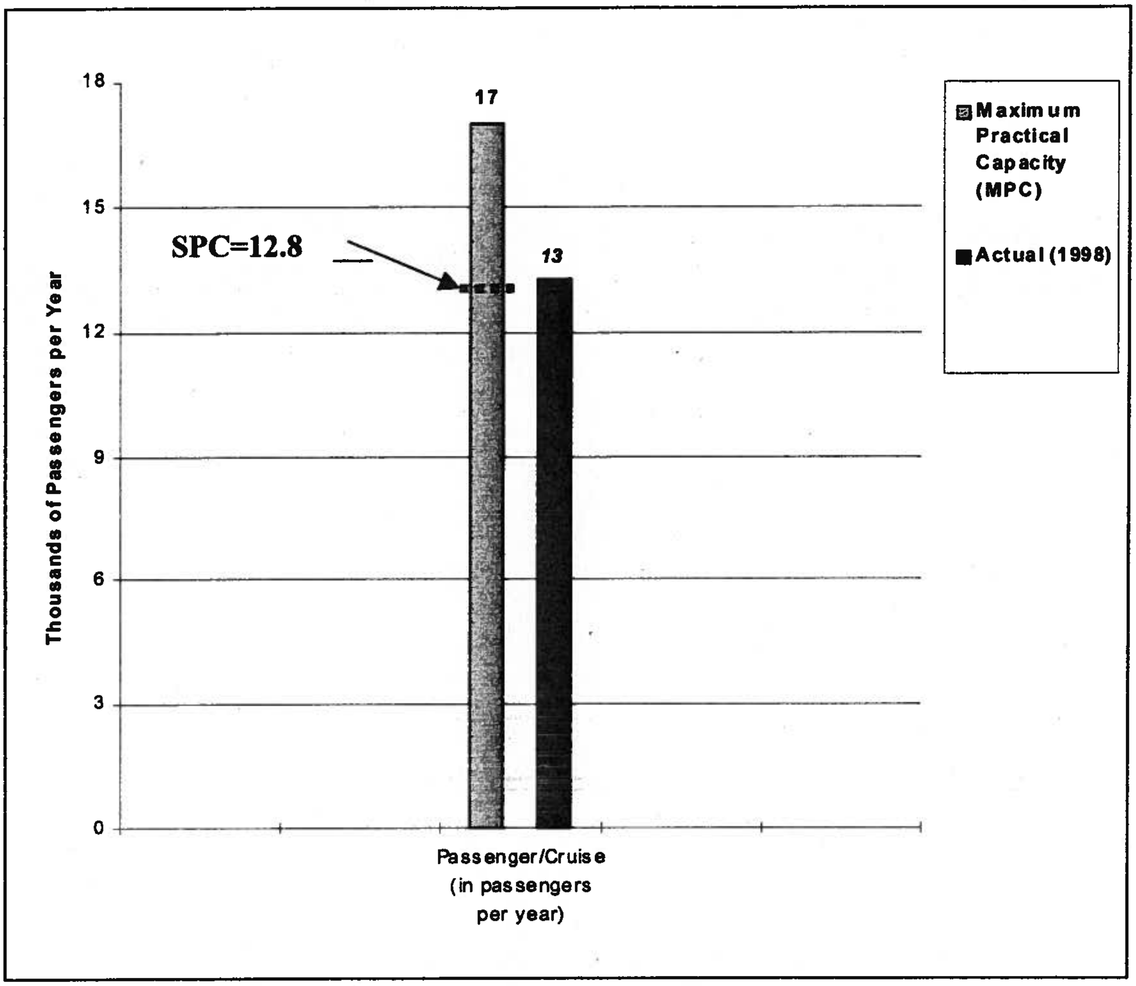
A summary of the Regional Port of Anchorage's actual 1998 cargo throughput versus the estimated Maximum Practical Capacity Throughput (MPC), in TEU's, Short Tons and Autos/year, for 1998 is presented in Figure ES-5.

Figure ES-5: Port of Anchorage Annual Cargo Throughput – Maximum Practical Capacity versus Actual 1998 Throughputs



Likewise, a summary of the Regional Port of Anchorage's actual 1998 passenger/cruise throughput versus the estimated Maximum Practical Capacity Throughput (MPC), in thousands of passengers per year, for 1998 is presented in Figure ES-6.

Figure ES-6: Port of Anchorage Annual Passenger/Cruise Throughput – Maximum Practical Capacity versus Actual 1998 Throughputs



Building on the inventory and throughput modeling, the future facility demands for the Regional Port of Anchorage were developed. The Sustainable Practical Capacities (SPC's) of the existing facilities, for each cargo type, were subtracted from the cargo forecasts to identify possible shortfalls (or over-capacities). The quantity of the shortfall was divided by the appropriate capacity for the associated new facilities to identify the required acres for each future terminal type. This exercise was performed for both the medium and high forecast for the years 2005, 2010, 2015 and 2020. Figure ES-7 summarizes the acres required for the medium forecast. Figure ES-8 summarizes the acres required for the high forecast.

Figure ES-7: Amount of New Terminal Acres Based on Medium Forecast

Cargo / Use Type	2005	2010	2015	2020
Containerized Cargo	19.4	35.6	43.1	63.9
Break-Bulk / Neo Bulk Cargo	0.0	0.0	0.0	0.0
Automobile Cargo	3.9	5.2	6.0	7.6
Liquid Bulk Cargo	0.0	0.0	0.0	0.0
Dry Bulk Cargo	0.2	0.2	0.2	0.3
Passenger / Cruise	0.0	0.0	0.3	0.7
Totals	**23.5**	**41.0**	**49.6**	**72.5**

Figure ES-8: Amount of New Terminal Acres Based on High Forecast.

Cargo / Use Type	2005	2010	2015	2020
Containerized Cargo	30.3	53.2	69.0	98.8
Break-Bulk / Neo Bulk Cargo	1.0	1.0	1.8	2.9
Automobile Cargo	3.2	5.1	6.8	9.3
Liquid Bulk Cargo	0.0	0.0	0.0	0.0
Dry Bulk Cargo	0.1	0.2	0.3	0.4
Dry Bulk Cargo - with Added Coal	3.1	6.1	8.6	11.5
Passenger / Cruise	0.0	0.4	0.7	1.1
Totals	**38.6**	**66.0**	**87.2**	**124.0**

The next step in the Master Plan was to develop an overall Phased Development Plan and a series of new terminal development alternatives. The macro phases are as follows:

Phase I Improvement of infrastructure on existing Port terminal areas.
Phase II Improvement of existing access infrastructure.
Phase III Container terminal development in the North Tidelands area (Adjacent to Port).
Phase IV Bulk commodity terminal development in the North Tidelands area.
Phase V North corridor preservation and access development.

It is anticipated that some of the additional needed new acreage can be achieved by effective reconfiguration of the existing Port area (such as conversion of existing roads to container storage areas), and possible use of nearby areas such as the Defense Fuels area. The net result is that most of the new non-container may be accommodated in areas other than the North Tidelands. Therefore, approximately 54 acres plus 7 acres circulation (medium forecast) to 89 acres plus 11 acres circulation (high forecast) will be needed for new container facilities in the North Tidelands area (Phase III). The average of the 61 and 100 acres is 80 acres. This is the target that was used for the development of a series of 12 Alternatives for North Tidelands container terminals. Approximately 10 to 12 acres will be needed for the bulk commodities/coal terminal if that scenario in the high forecast were to be achieved.

Phase I consists of reconfiguration of the current Port of Anchorage container operations and the realignment of the access roads to these facilities. In addition, POL 2 will be renovated to an enhanced multi-use facility and other wharf, building and civil improvements will be undertaken over the next 10 years. Phase II and V improvements will occur over a longer period as guided by the Access Plan element of this Master Plan. Phase III and IV improvements represent the major new land development projects over the next 20 years. Therefore, a series of Phase III alternatives was developed to ensure a comprehensive study of feasible options.

Alternatives 1 through 12 represent the Phase III options to accommodate 80 acres of new container facilities. The following table lists a brief description of the 12 Alternatives with rough order-of-magnitude costs for the container terminal developments only. Figure ES-9 presents the order of magnitude cost estimates for each alternative in 1999 dollars. These estimates are intended to be used in conjunction with a full array of other considerations, such as wharf access, efficiency of terminal configuration, etc. For all of the Alternatives, the adjacent bulk commodities/coal facility was not included in the any of the cost estimating.

Figure ES-9: Order of Magnitude Cost Estimates – Alternatives 1-12

Alternatives	**Order of Magnitude Cost Estimate** (Based on Conceptual Plan)
Alternative 1 - Low Fill – w/Remote Yard	$104 M
Alternative 2 - Medium / Low Fill	$111 M
*Alternative 3 - Medium Fill	$134 M
Alternative 4 - Medium Fill – Pile Supported Backlands	$306 M
Alternative 5 - Large Fill	$157 M
Alternative 6 - Medium Fill, Slight Jog	$131 M
Alternative 7 - Medium Fill, Medium Jog	$138 M
Alternative 8 - Very Low Fill – w/ Remote Yard	$89 M
Alternative 9 - Cut Into Bluff	$94 M
Alternative 10 – Fill West of Existing Wharves	$194 M
Alternative 11 – Develop South of Existing Port–ARRC Prop.	$220 M
Alternative 12 – Other Locations such as Cairn Point	N/A

*Recommended Alternative

The consulting team in association with the Port staff performed an evaluation process of the 12 Alternatives. It was determined that three Alternatives merited further review and refinement. The three Alternatives were: Alternative 1, Alternative 2 and Alternative 3. These three Alternatives were chosen because they best meet the challenges of the key project criteria and because of critical cost and other significant planning issues. After further detailed evaluation, Alternative 3 emerged as the recommended Alternative. It can be built with a modest fill program while still meeting the needs of the Port's future throughput capacity requirements. Alternative 3 also provides maximum flexibility and expandability which is necessary in order to be responsive to the 'market driven' approach that the consulting team has embraced throughout the course of the Master Plan. The Recommended Master Development Plan is presented in Figure ES-11 at the end of this Executive Summary.

Recommended Master Development Plan

The Master Development Plan Phasing was developed to be highly flexible and expandable, from both a Master Plan and individual terminal perspective, to allow for future variations. The Recommended Master Development Plan has been divided into the five major Phases listed above. These five Phases have also been further broken down into sub-phases, each with a conceptual budget estimate in 1999 dollars. A summary of sub-phased and budget estimates is presented in Figure ES-10.

Figure ES-10: Order of Magnitude – Cost Estimate by Phase

Phase	**Order of Magnitude Cost Estimate – By Phase** (Based on Recommended Master Development Plan) **in Millions**
Phase I-A	$28 M
Phase I-B	$15 M
Phase II	See Access Plan
Phase III-A	$55 M
Phase III-A Optional	$45 M
Phase III-B	$13 M
Phase III-C	$24 M
Phase IV	$60M (See note 1)
Phase V	See Northern Access Corridor Reconnaissance Study, May, 1998

Notes :

1. See North Tidelands Coal Terminal Study, December, 1997

Access Plan Summary

This portion of the Executive Summary provides the key findings of the Access Plan element for the *Regional Port of Anchorage Master Plan.* This study considers the existing and future landside transportation facilities and traffic related to the low, medium and high forecasts.

The following are the key access objectives:

- Access Efficiency
- Mobility and Connectivity
- Integration and Safety

An overall goal of the Access Plan was to provide input for use in future transportation planning processes. The volume of Port related traffic for future conditions was analyzed and presented in the body of the Access Plan.

Agency Transportation Planning Objectives

The planning of the following agencies were considered as part of this study:

- Federal Planning Objectives
- State Planning Objectives
- Municipal Planning Objectives

Key Access Plan findings and conclusions are as follows:

- There are capacity deficiencies on the primary roadways that convey Port-oriented traffic.
- Locations of concern include the Whitney/Ocean Dock Road intersection, the Central Business District and the A/C viaduct ramps.
- Extension of Ingra-Gambell to provide a direct connection to the Port would substantially improve levels of service on Port area roadways and facilitate the Municipality's Comp Plan objective of diverting truck traffic out of the Central Business District.
- Development of a North Port Access will also improve reserve capacity on Port area roadways and support key local and statewide economic development objectives. This Access would also provide an additional route between the Port and the National Highway System.

Key Access Plan recommendations are as follows:

- The Port should continue to vigorously support the public transportation process with the objective of elevating the priority of Port access improvements.
- Use the Ship Creek Transportation Study and the AMATS model to further refine future traffic volumes and identify roadway impacts in the Port Area.
- Provide planning and engineering assistance to the Ingra-Gambell Extension effort.
- Provide planning and engineering assistance to the AMATS Long Range Transportation Plan and related program documents.
- Continue to pursue corridor preservation and environmental documentation for a North Port Access.

Implementation Plan Summary

In this element, specific steps for each of the previous elements are summarized. Key implementations steps are presented below.

Implementation Program - Strategic Marketing Plan

- Foster Improvements for Existing Tenants
- Support In-State Distribution
- Pursue Asian Container Shipping
- Pursue Natural Resource Opportunities for Coal
- Pursue Natural Resource Opportunities for Timber

- Pursue Opportunities for Seafood Products
- Initiate New Terminal Expansion Program
- Pursue Cruise Line Opportunities
- Negotiate with DOD for Additional Opportunities
- Seek Alternative Funding Sources

Implementation Program - Facilities Plan

• Phase I-A, Existing Facilities Improvement	2000	2005
• Phase I-A, Existing Facilities Improvement	2005	2010
• Phase III-A, Northern Tidelands Expansion	2000	2005
• Phase III-B, Northern Tidelands Expansion	2010	2015
• Phase III-C, Northern Tidelands Expansion	2015	2020
• Phase IV, Natural Resources Facility	2010	2020
• Phase V, North Access Improvements Program	2010	2020
• Annual Maintenance	2000	2020

Implementation Program - Access Plan

- Pursue Internal Port Circulation Recommendations
- Support Public Transportation Planning Process
- Elevate Priority of Port Access Improvements
- Coordinate with Ship Creek Transportation Study
- Coordinate with Final Update of AMATS Model
- Assist in Planning Ingra-Gambell Extension effort
- Pursue Corridor Preservation for North Access

Economic Impact Overview

An overview study estimating the economic impact of the Port of Anchorage was undertaken as a portion of this Master Plan. This brief study compared known national performance data with conditions related to the current and potential future Port of Anchorage cargo activities. Key elements of this study include a consideration of the direct, indirect and induced impacts for the immediate port industry, the port users and the capital improvement projects for the Port. By comparing known national data as provided by the Maritime Administration (MARAD) to known conditions at the Port of Anchorage, order-of-magnitude impacts have been estimated.

The key findings of this study are:

The estimated current beneficial economic impact of the Port of Anchorage to the state of Alaska Gross State Product (GSP) is approximately $725,000,000 per year. This impact may more than double over the 20 year planning horizon. The Port of Anchorage also supports a significant number of jobs in Alaska.

Since the Port of Anchorage is more important to Alaska than the typical port in the lower 48 states, this rough estimate may, in fact, be conservatively low. A future study could be undertaken to provide a more detailed estimation of these impacts.

Master Plan Summary

The following points summarize the key findings of the Regional Port of Anchorage Master Plan:

- The Regional Port of Anchorage is, and will continue to be, an essential and significant element of Alaska's economic vitality.
- The Port should prepare for growth at a rate which matches or exceeds the population growth and **may double** by 2020.
- Opportunities to be vigorously pursued by the Port include: growth in domestic and international container traffic, automobile and neo-bulk cargo, bulk commodities and cruise activities.
- Facility improvements required to accommodate this growth include enhancements and reconfiguration of existing Port lands, renovation of POL 2 and a phased development of the North Tidelands area for container and possible bulk commodity expansion.
- Access improvements, including elimination of internal roads, coordination with and support of public transportation and support of corridor preservation for North Access, are essential in order to meet this growth expectation.
- The anticipated growth will also create a substantial increase in the number of jobs, taxes and other revenue sources for the region.
- It is equally essential that the Port's on-going and future maintenance program be funded and implemented in order to preserve infrastructure and access vital to the Port's success.
- Improved port facilities and rail and road transport systems could lead to different outcomes than those projected in previous studies and improve the viability of certain projects.
- Preliminary estimates indicate a potential for 2.2 million to 2.6 million tons of coal to be shipped out of the Healy and Palmer area mines yearly, which would support a new coal facility in Cook Inlet.
- Availability of alternative cruise ship ports-of-call would have favorable impact on expansion of the tourism market in Southcentral Alaska by providing access to different areas of the state.

Mike Frank

From: Alice Aguilar
Sent: Tuesday, September 11, 2007 12:03 PM
To: Mike Frank
Subject: Huge port expansion proposed AK JOURNAL OF COMMERCE 040802 online
Importance: High

Huge port expansion proposed

By James MacPherson
Journal Reporter
Publication Date: 04/08/02

For the past year and a half, engineers at Tryck Nyman Hayes Inc. have been drawing up plans for a new deep-draft dock expansion at the Port of Anchorage.

Now, the $1.5 million plan for the more than $225 million project may be shelved in favor a new design its engineers say is bigger, better and millions of dollars cheaper.

Peratrovich, Nottingham & Drage Inc. in March submitted a plan for port expansion north and 400 feet seaward of the existing dock, incorporating about 9 million tons of fill to create a nearly mile-long dock. Some 85 acres would be added to the port's existing 100-acre footprint.

The cost: $146 million.

Bill Sheffield, port director and former Alaska governor, shared the new plans with the Port of Anchorage commission members March 27.

Sheffield said the city-owned port will double in size by 2020, if expansion and renovation of the port is done to handle the increased growth.

Already, the port serves more than 80 percent of Alaska, with an annual economic impact of $725 million, Sheffield said.

Sheffield told the Journal he is leaning toward PN&D's plan, which he said would make the Port of Anchorage viable well into this century.

"We owe it to ourselves to make the right decision for the next 40 to 50 years," Sheffield said.

Sheffield said the project would be split into phases and could be completed in the next four years.

The expansion could be paid for with port profits and state and federal grants, Sheffield said.

The Legislature last session approved the first $6 million toward dock expansion.

Sheffield said he's already been in contact with Alaska Republicans, Sen. Ted Stevens and Rep. Don Young, who have been supportive toward funding the newest port expansion project.

EXHIBIT B

"I think it is doable," Sheffield said. "They think it is doable."

Anchorage Mayor George Wuerch appointed Sheffield to the post last spring. He officially took over as the port director June 19.

The plan being crafted by engineers at Tryck Nyman Hayes began before Sheffield became port director. It calls for a new deep-draft, multipurpose dock extension that would accommodate ships up to 1,000 feet long. Other work includes deepening the harbor from 35 feet at low tide to 45 feet; installing larger container cranes; renovating and widening the current dock; and developing some 40 acres of land to support the new dock.

The new Intermodal Marine Facility would handle cargo much more efficiently and enable large vessels to moor in Anchorage, such as homeported military vessels and cruise ships.

John Daley, project engineer with Tryck Nyman Hayes, said the design his company has been working on for the last 18 or so months was won based on a competitive request for proposal.

The design, Daley said, "meets the needs identified by the port and as outlined by the 20-year master plan."

Tryck Nyman Hayes has been paid $1.5 million for the work, Daley said.

PN&D's expansion study was commissioned by Sheffield at a cost of $30,000.

"We're a little frustrated," Daley said, adding his company and many other engineering firms, including several in the Lower 48, would have bid on the study given PN&D.

"It wasn't a standard contracting method used for public projects," Daley said. Sheffield said he has the authority to ask for an alternative proposal.

Daley called PN&D's study an "interesting proposal which significantly alters the port master plan."

PN&D's plan may not be as cost-effective as it appears, he said.

"We believe there are an awful lot of hidden costs in it," Daley said, adding that his company is calling for a third-party review of the project and its cost.

Sheffield said he intends to do that, and city officials should decide within a couple of months on which plan to adopt.

Daley said his company will complete its design by the end of the year, which would enable construction to start by next spring. But a two-month delay in the process now would probably push the project back by a year, he said.

Since 1961, the port has grown from a single pier handling 38,000 tons a year to a five-terminal dock that in peak years has handled more than 3 million tons of cargo, petroleum and cement annually, according to port officials.

The existing dock is too small, outdated and is "experiencing severe corrosion of support piles and loose sediment buildup underneath," according to PN&D's study.

Engineer Dennis Nottingham of PN&D said that adding to the existing dock structure is nothing more than a piecemeal approach that would have a short useful lifespan.

"The port plan has to go 50 or 100 years," Nottingham said.

His firm's approach looks long range and takes advantage of modern dock-building technology PN&D developed in 1980, which uses sheet pile membranes to create a bulkhead for holding compacted gravel.

Called an open cell system, the dock technology is used extensively in the Lower 48 and Alaska, including more than a mile of combined dock length in Cook Inlet from Kenai to Anchorage, Nottingham said.

Most recently, the technology was used to construct an 1,100-foot long dock at the Williams Petroleum Terminal near the Port of Anchorage.

The firm's design has won several engineering awards, including one which Nottingham called the Nobel Prize of engineering.

But when the design was used across Knik Arm at the new $8 million port at Point MacKenzie, it raised concerns by U.S. Army Corps of Engineers who noted possible signs the dock is shifting. The Corps also said soil underlying the dock contained a weak layer that could cause the dock to collapse in an earthquake.

PN&D officials have disputed the claims about the integrity of the dock, which opened last May.

The project has been peer-reviewed by three separate engineering firms, who found nothing wrong with the design, Nottingham said.

A federal review of the dock has not yet been completed, said Marc Van Dongen, Port MacKenzie port director.

Van Dongen said the solution to the concerns is to compact the gravel dock, a process being planned for this summer.

"There is nothing wrong with this dock," Van Dongen said. "Once it is compacted, it will be the safest piece of real estate in Southcentral Alaska. It won't go anywhere in the event of a major earthquake."

Click here to return to story:
http://alaskajournal.com/stories/040802/loc_port_expansion.shtml

Alice Aguilar

From: NewsBank -- service provider for Anchorage Daily News Archives [newslibrary@newsbank.com]
Sent: Thursday, March 06, 2008 2:16 PM
To: ecolaw
Subject: Anchorage Daily News Document

Anchorage Daily News (AK)

Anchorage Daily News (AK)

April 30, 2001

Sheffield considered for port job
CANDIDATE: He resigned from the Alaska Railroad in January.

Author: Tim Pryor
Anchorage Daily News

Staff

Edition: Final
Section: Metro
Page: B3

Estimated printed pages: 2

Article Text:

Just months after he resigned as president of the Alaska Railroad, former Gov. Bill Sheffield is a contender to run the city's port.

Mayor George Wuerch said he plans to interview at least one other person but won't make a decision until after he meets with Sheffield next week.

Sheffield ran the railroad from 1997 until his resignation in January. He said he left mostly because of a difficult final 15 months that included three derailments of fuel cars.

Sheffield served as governor from 1982 to 1986.

Wuerch said Sheffield is an appealing candidate because he has developed capital projects and demonstrated skills working with interest groups.

Sheffield obtained about $250 million in federal funds to improve the railroad, which hadn't seen major work since the 1950s.

Since October 1999, three derailments spilled more than 133,000 gallons of jet fuel and gasoline.

One accident investigator said that despite the derailments, the track was in better shape than it had been a few years earlier.

Wuerch said Friday that he is looking for a transition director as the port evaluates how much to charge shippers, has its harbor deepened and builds a new dock to accommodate larger ships.

He said he expects the job to last up to a year.

EXHIBIT C

Former port director Don Dietz retired April 20. He had held the job since 1992.

Reporter Tim Pryor can be reached at tpryor@adn.com or 257-4310.

Alice Aguilar

From: NewsBank -- service provider for Anchorage Daily News Archives [newslibrary@newsbank.com]
Sent: Thursday, March 06, 2008 2:24 PM
To: ecolaw
Subject: Anchorage Daily News Document

Anchorage Daily News (AK)

Anchorage Daily News (AK)

June 20, 2001

Port orientation
Assembly members tour the city dock where big plans are afloat

Author: Sarana Schell
Anchorage Daily News

Staff

Edition: Final
Section: Business
Page: E1

Estimated printed pages: 3

Article Text:

Former governor and new port director Bill Sheffield invited members of the Anchorage Assembly down to the Port of Anchorage Tuesday for a spin around the harbor in a tugboat, a port bus tour and lunch aboard a cargo vessel.

The orientation was part of Sheffield's plan to publicize the city-owned port, and open dialogue among the city, the port and the businesses that operate there.

"I want to make sure the Assembly knows what they're in charge of," Sheffield said. "We're proud of the port, and I want other people to be proud of it, too. The only way to do that is to get them down here."

The Assembly oversees the operation of the port, giving its stamp on everything from rate changes, which recently took months to approve, to the appointment of the port director by the mayor.

"We're like any other municipal department," said port spokesman Roger Graves. "Anything we do has to be approved by the Assembly."

Much of what Alaskans eat, wear, drive and otherwise consume comes into the state through the port, which lies just north of downtown. The port serves 80 percent of the state's population, with an economic impact of $725 million per year, Don Dietz, then port director, said in a presentation to the

Assembly earlier this year.

Around 40 Assembly members, port officials and business leaders toured the port. Given that several Assembly members commented they hadn't been on a tour of the port -- or even down to the port at all -- Sheffield may have been on to something.

Sheffield presented the port's plans for expansion, and port users elaborated on why the development was important.

First priority is to expand one of the port's five docks, said Sheffield, as recommended by a port master plan developed two years ago. The dock is relatively small and handles only petroleum. Expansion is targeted for 2005. It could then handle bigger cargo ships, like two being built for the Tacoma-to-Anchorage route by cargo shipping company TOTE. The dock could handle cruise ships and a ferry, too.

Second priority is to deepen the harbor, from 35 feet deep at low tide to 45 feet. More than $2 million in federal funds are already dedicated to annual dredging by the U.S. Army Corps of Engineers, Dietz said earlier this year.

The Corps recently studied deepening the harbor, establishing their interest in the project, according to the port. Sheffield said expansion would mean more room for military use as well.

Tuesday's tour gave a fresh perspective on proposals Assembly members had heard before.

"It helps to realize what an economic engine it is," Assemblywoman Fay von Gemmingen said of the port.

Assemblyman Doug Van Etten said the visit provided background knowledge that would be helpful when making decisions about other city issues. Van Etten said he would weigh heavily what he'd heard about the intensity of truck traffic when making decisions about trails and roads to accommodate city developments, such as a new convention center for downtown. Saturday and Sunday are two of the heaviest freight days.

"We're obviously going to have to give it consideration. When you hear how imperative their operations are," Van Etten said, "other stuff may have to take second place."

Assemblyman Allan Tesche asked Williams Alaska Petroleum Inc. president Randy Newcomer to point out on a map where Williams would like to fill in with gravel to build a railroad loop to make unloading tank cars easier. It would also alleviate some of the train traffic through the area. Tesche and the others were scheduled to vote on the proposal later Tuesday. Newcomer indicated the area on the map. Later, he showed the group the area from the front of the tour bus.

"To there?" Tesche asked.

"From the end of where BP has already filled there, to the edge right in front of us," Newcomer said, sketching a line in the air.

The opportunity for an exchange seemed to be appreciated by the port users as well as the Assembly members.

Patrick Gamble, chief executive of the Alaska Railroad Corp., told the group that his organization wants to be a part of discussions about future planning.

"We're planning a complete redevelopment of our railyard, and we want to be in sync with our partners and primary landowner, which is the city," Gamble said. "We have money to bring to the table. If we can just link our visions, there is tremendous opportunity for growth."

Sheffield, former president of the Alaska Railroad, said he was thrilled with the morning's event, and wants to bring the port to more people's attention.

"I'd like to have a Port Day," he said, "like the Alaska Railroad does."

Reporter Sarana Schell can be reached at sschell@adn.com.

Record Number: 29270

Alice Aguilar

From: NewsBank -- service provider for Anchorage Daily News Archives [newslibrary@newsbank.com]
Sent: Wednesday, March 05, 2008 2:42 PM
To: ecolaw
Subject: Anchorage Daily News Document

Anchorage Daily News (AK)

Anchorage Daily News (AK)

June 18, 2002

Port of Anchorage's top engineer to quit
Richard Burg says he couldn't support city's new expansion plan.

Author: The Associated Press

Wire

Edition: Final
Section: Metro
Page: B3

Estimated printed pages: 2

Article Text:

The Port of Anchorage's top engineer left his job last month over differences of opinion in the direction that expansion plans should take.

Richard Burg, who had almost a dozen years with the city-owned port, told the Alaska Journal of Commerce he could not support a new expansion plan pushed by port director and former Alaska Gov. Bill Sheffield.

"I found myself on the wrong side of the sheet pile," Burg said in reference to the newest port design, which would use scalloped-shaped steel plates to create the facility. "I could not support the vision of the administration. Their vision is not my vision, so I decided to step aside and get out the way and let it go in the direction it's going to go."

Sheffield would not talk about Burg's leaving the port, citing personnel issues.

For the past few years, Burg had been working with engineers at Tryck Nyman Hayes Inc. drawing up plans for a new deep-draft dock expansion at the port.

The city had spent $1.5 million for that plan. But in March, Peratrovich, Nottingham & Drage Inc. submitted an alternative at Sheffield's request. It envisions expanding the port north and 400 feet seaward of the existing dock, incorporating 9 million tons of fill to create a nearly mile-long dock.

EXHIBIT D

About 85 acres would be created and added to the port's existing 100-acre footprint.

At $146 million, the new facility is about $80 million less than what it would cost for the other port expansion plan, Sheffield said.

"It's a very attractive alternative for us," Sheffield said. "It's bigger and it's millions cheaper, and money is getting harder to come by now."

In time, Sheffield said, an engineer will be hired to replace Burg. Until then, the port will contract out work to R&M Consultants, which has been hired to perform a review of the newest port expansion plan.

Record Number: 262008

P | N | D
ENGINEERS, INC.

December 28, 2005

To Whom It May Concern:

Discussion of Open Cell™ Development

The modern Open Cell Sheet Pile bulkhead started to come into prominence in the 1980s as PND began a series of research and development projects. However, it was not until 1995 that tests showed the exact nature of Open Cell performance and this finding led to the first patent. Subsequently there is a recently allowed patent application with claims for the total system and a third patent pending that describes the components of the system.

PND intends to enforce these three patents and other intellectual property in order to protect its proprietary rights.

Independent evaluation by various geotechnical engineers now confirms the tremendous system strength, economy and adaptability to a wide variety of conditions.

In conjunction with Open Cell technology, PND has developed a deep compaction method called "vibracompaction," which allows economical Open Cell soil stabilization in even the most difficult conditions.

PND regularly consults with others and works jointly with them to apply Open Cell technology to a wide variety of projects.

PND Engineers, Inc.

Dennis Nottingham, P.E.
President

1506 WEST 36TH AVENUE · ANCHORAGE, ALASKA 99503 · Phone 907.561.1011 · Fax 907.563.4220

EXHIBIT E

MUNICIPALITY OF ANCHORAGE

ASSEMBLY INFORMATION MEMORANDUM

AIM No. 105-2007

Meeting Date: November 27, 2007

From: **Mayor**

Subject: **Port of Anchorage Expansion Project**

OVERVIEW. The Port of Anchorage Intermodal Expansion Project (PIEP) is a major transportation infrastructure project currently underway. With estimated projected development cost at approximately $500 million, PIEP activities include but are not limited to; Passenger Terminal, Expanded Wharf, Barge Terminal Development, and Road and Rail Access Development that will add over 135 acres of new real estate at the Port. The barge terminal and the road and rail access are especially important as dual use facilities that will serve as both a commercial intermodal facility and as the platform for the deployment of the U.S. Army 3rd Stryker Brigade Combat Team (SBCT) that can deploy anywhere in the world within 96 hours. The Department of Defense chose the Port of Anchorage as its 15th "Strategic Port" because of its deep water capability and shared connectivity to two military installations with assets critical to the nation's defense and to Alaska's force projection mission.

BACKGROUND. The Port of Anchorage (Port) serves 80 percent of the State with 90 percent of all consumer goods. The Port is planning a variety of expansion activities to enhance the transportation of these goods to its supported communities within the State of Alaska. Potential expansion activities are scheduled to occur over approximately the next six years, utilizing federal and non-federal funds administered by the U.S. Department of Transportation (DOT) Maritime Administration (MARAD). Expansion activities include, but are not limited to:

- Expansion of commercial dock space,
- Support of military rapid deployment from Alaskan bases, including the U.S. Army's Stryker Brigade Combat Team Sealift Operation,
- Additional barge dock capacity,
- Passenger Terminal,
- Improved rail connection to the Port for commercial and military use, and
- Acquisition, installation, and operation of security equipment and services.

The Port intends to implement this expansion program through multiple projects to accomplish multiple goals in a relatively short time period. To meet the goals of the expansion program, the Port obtained environmental permits and records of decision and now must: ensure funding, evaluate various niche market opportunities, perform programming and planning, devise and manage multiple interactive schedules, coordinate with the community, manage design and construction activities, direct and oversee contractor activities, interface with the U.S. Army

EXHIBIT F

Stryker Combat Team, acquire Port Intelligent Transportation Systems (ITS) and security equipment and services, and maintain budgets and program progress.

PLAN OF FINANCE. Financing of the expansion program is expected to be obtained from a number of sources including, equity funds of the Port of Anchorage, Federal and state funds, including grants, tax-exempt debt, initially in the form of commercial paper, with long term funding to be provided by port revenue bonds. The debt will be secured by revenues of the Port and will not be a general obligation of the Municipality of Anchorage. The Port and Finance Department staff have had initial discussions with the Municipality's Bond Counsel and Financial Advisor regarding the plan of finance and are preparing to review the expansion program and the financing of the expansion program with the Assembly at a work session to be scheduled in the near future.

Prepared by: Ross Risvold, Public Finance & Investments Manager
Concurrence: Sharon Weddleton, CFO
Concurrence: Governor Bill Sheffield, Port Director
Concurrence: Edward Leon, Port Finance Director
Concurrence: Denis C. LeBlanc, Municipal Manager
Respectfully submitted: Mark Begich, Mayor

AIM 105-2007

Content Information

Content ID : 005746
Type: InfoMemorandum - AIM
Title: Port of Anchorage Expansion Project
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Assembly Meeting Date: 11/27/07

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M.O.A.
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Workflow Name	Action Date	Action	User	Security Group	Content ID
AllAIMSWorkflow	11/21/07 3:31 PM	Checkin	pruittns	Public	005746
Finance_SubWorkflow	11/21/07 3:32 PM	Approve	weddletonsb	Public	005746
Port_SubWorkflow	11/21/07 3:33 PM	Approve	sheffieldwj	Public	005746
MuniManager_SubWorkflow	11/26/07 9:10 AM	Approve	leblancdc	Public	005746
MuniMgrCoord_SubWorkflow	11/26/07 9:20 AM	Approve	abbottmk	Public	005746

Addendum

CONSENT AGENDA – **INFORMATION & REPORTS**

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

June 1, 2005

Colonel Timothy J. Gallagher
U.S. Army Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Re: Anchorage Marine Terminal Redevelopment Environmental Assessment

Dear Colonel Gallagher:

The National Marine Fisheries Service (NMFS) has reviewed the Public Notice for the Port of Anchorage Expansion Project (POA-2003-502-2). The completed project using the preferred alternative in the applicant prepared Environmental Assessment (EA) would discharge fill material over approximately 135 acres of intertidal and subtidal waters of Upper Cook Inlet. This public notice addresses only Phase 1 of this project. Phase 1 would discharge 1,075,500 cubic yards of dredged and /or fill material within a 27-acre intertidal area north of existing Port facilities. This area would be filled in all the alternatives discussed in the EA.

Essential Fish Habitat

The U.S. Army Corps of Engineers has determined that the described activity may adversely affect Essential Fish Habitat (EFH). NMFS agrees with this determination. The Magnuson-Stevens Fishery Conservation and Management Act requires NMFS to make conservation recommendations regarding any federal action that would adversely affect EFH. Incorporating the proposed conservation measures into the project permit can reduce the adverse effects of the proposed project.

NMFS has expressed concerns about this project in previous correspondence to the Maritime Administration (MARAD). Our letters (dated September 17, 2004, December 9, 2004 and April 7, 2005) consistently state that NMFS prefers Alternative B, which would minimize the impact to EFH by providing a small migratory corridor to fish under pile-supported docks. MARAD and the Port of Anchorage (POA) prefer Alternative A for engineering and economic reasons. However, the Clean Water Act Section 404(b)(1) guidelines specify that the Corps may only permit the least environmentally damaging practicable alternative (40 CFR 230.10(a)). The information NMFS has reviewed does not demonstrate that Alternative B is not practicable.

EFH Conservation Recommendations

NMFS offers the following recommendations pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act:

1. The Corps should prepare an independent alternatives analysis for the full POA expansion project to identify the least environmentally damaging practicable alternative. Based on the EA prepared by the applicant and related information, NMFS opposes the selection of Alternative A as the preferred alternative. Alternative B (or a variation of Alternative B) appears to offer a viable option with greatly reduced effects on EFH for salmon. NMFS is prepared to assist the Corps in completing a more rigorous alternatives analysis to account for effects to EFH.
2. No permit should be issued for Phase 1 until a draft of the proposed mitigation plan is approved by the Corps in consultation with NMFS and other appropriate agencies. In previous discussions, the agencies agreed to permit this project in two phases to prevent project delays while differences on key issues are resolved, including mitigation. A draft mitigation plan and a schedule for developing a final plan will provide assurance that a mitigation plan will be finalized before Phase 2 of the project. This plan should include clear, concise, and measurable objectives, along with milestone dates for the submittal of reports which will indicate progress toward those objectives.
3. No permit should be issued for Phase 1 until a mitigation escrow account has been established and appropriate fees deposited.

Please note that under section 305(b)(4) of the Magnuson-Stevens Act, the Corps is required to respond in writing within 30 days to NMFS EFH Conservation Recommendations. If the Corps does not make a decision within 30 days, the Corps should provide NMFS with a letter to that effect, and indicate when a full response will be provided.

__Marine Mammals__

The depleted Cook Inlet beluga whale stock uses Knik Arm, including the proposed project area. We would expect up to several hundred beluga whales to be in Knik Arm during the ice-free months, as this area provides important feeding habitat due to the presence of anadromous fish returns into Ship Creek and other drainages of the upper Arm (Eagle River, Matanuska River, etc.). The proposed construction activity has the potential to introduce significant noise into the water column which would be detected by these animals and may cause adverse behavior reactions and/or injury, depending on the extent of exposure and level of noise. Without specific authorization under the Marine Mammal Protection Act (MMPA) for the unintentional taking of marine mammals, this type of effect on beluga whales may constitute a violation of that Act. Appropriate permit conditions would reduce the chance of disturbing beluga whales. We realize the work to be done under Phase 1 would not include pile driving, however we are including recommendations for pile driving at this time so the applicant is aware of the monitoring and research needs well in advance of that work. Because later phases of construction include pile driving, and port operations may also result in noise levels that harass these whales, we recommend the POA seek MMPA authorization through our office for any incidental take.

Recommendations

1. Pile driving in water (i.e., not in areas de-watered due to tidal action or by other means) should be monitored so that beluga whales or other marine mammals are not incidentally taken (harassed or injured) by high noise levels. For this purpose, NMFS considers in-water noise exceeding 160 dB re: 1μ Pa. to be capable of such effect. The applicant should conduct a study of the noise signature and propagation characteristics for pile driving at the POA using the same equipment and representative materials prior to construction. The results of this work should be presented to NMFS' Anchorage office (Barbara Mahoney, (907) 271-3448, fax: 271-3030) along with the applicant's recommendation for the radial extent of the > 160 dB zone. Qualified marine mammal observers (having stop work authority) should be present during pile driving to observe for the presence of marine mammals within this zone, and should direct pile driving to cease whenever marine mammals are observed within or about to enter this zone. Work during low-light conditions should be observed using night-vision/light amplification equipment.
2. Where feasible, vibratory pile driving methods should be used instead of hammer/impact methods.
3. No in-water blasting should occur.
4. The POA should minimize noise impacts to marine mammals during construction and operations by having the non-essential underwater equipment turned off when not in use.
5. A beluga whale monitoring program should be conducted to provide additional information on beluga whales in the POA project area, before, during and after construction activities.
   - A) Shore-based observations by at least two teams would monitor beluga whale movements, timing, group size, locations, and identifiable behaviors near the POA project area. The study should be conducted from March through November (excluding the winter ice months) starting in 2005 and continuing through each year that construction occurs plus one year after project completion. Beluga whale observation should be performed six hours per day, twice a week. The observers should attempt to monitor beluga whale presence or absence through most tide levels for each month. Such monitoring should assess patterns of beluga whale use of the area near the POA, and if a strong correlation is found with tidal cycle, avoiding intrusive disturbances during those periods may ameliorate impacts on beluga whales. For instance, if beluga whales usually appear during low tides, then construction activity can be scheduled to avoid operations during low tides. Short term impacts can be documented if whales move out of the area when various construction activities start up. Project details, as coordinated with NMFS, should be attached as an appendix to the COE permit.
   - B) A GIS database should be set up to manage and analyze whale observations relative to variables such as season, bathymetry, tide, and distance from POA activities.
   - C) The POA should map sound attenuation for Knik Arm near the POA

expansion project. Project details, as coordinated with NMFS, should be attached as an appendix to COE permit.

Conclusion

NMFS does not oppose issuance of a permit for Phase 1 of the project while remaining details are worked out regarding the alternative to be permitted in Phase 2, because the Phase 1 work would be part of the project regardless. However, while Phase 1 proceeds we urge the Corps to develop a more rigorous analysis to identify the least environmentally damaging practicable alternative, and we recommend that the POA seek authorization for incidental takes of marine mammals under the MMPA. If you have any questions regarding EFH or fish resources, please contact Brian Lance at (907) 271-1301 or Larry Peltz at (907) 271-1332. If you have questions regarding marine mammal issues, please contact Barbara Mahoney at (907)271-1301.

Sincerely,

For Donald J. Berg

James W. Balsiger
Administrator, Alaska Region

cc: Applicant: Port of Anchorage, Attn: Roger Graves, 2000 Anchorage Port Road, Anchorage, Alaska

*MARAD	Michael.Carter@marad.dot.gov
*ADNR/OHMP	stewart_seaberg@dnr.state.ak.us
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United States Department of the Interior

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

FILE COPY

IN REPLY REFER TO:

AFWFO

JUN - 6 2005

Colonel Timothy J. Gallagher
District Engineer, Alaska District
U. S. Army Corps of Engineers
Post Office Box 6898
Anchorage, Alaska 99506-6898

Re: Ship Creek
POA-2003-502-2

Dear Colonel Gallagher:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Corps of Engineers (Corps) public notice dated April 23, 2005, which describes a proposal by the Port of Anchorage (POA) and the U.S. Maritime Administration (MARAD) to expand the Port of Anchorage. The public notice depicts the details of the entire port expansion project, which includes placing fill into 135 intertidal and subtidal acres, dredging 286 subtidal acres, and constructing an 8,800-foot-long sheet-pile dock face. It also references, and provides public electronic access information to, an Environmental Assessment (EA) prepared for the entire project by MARAD. However, at this time, the public notice seeks to authorize only Phase 1. Phase 1 involves the discharge of 1,075,500 cubic yards of fill within a 27-acre intertidal area.

The following comments and recommendations are submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.) and constitute the report of the Department of the Interior. These comments are also for your use in determination of 404(b)(1) guidelines compliance (40 CFR 230), and in your public interest review (33 CFR 320.4) relating to protection of fish and wildlife resources.

Based upon the project description, the Service concurs that the proposed project is not likely to adversely affect any species listed as threatened or endangered under the Endangered Species Act, as amended. Further consultation regarding this project is not necessary at this time. If project plans change, new information becomes available that would indicate listed or proposed species may be affected by the project, new species are listed that may be affected by the project, or listed species are observed on the project site, consultation should be reinitiated by your agency.

EXHIBIT H

Site Resources

Eighteen streams which support anadromous fish are tributaries to Knik Arm. Fish from other streams which enter Upper Cook Inlet, such as the Susitna and Little Susitna Rivers, may also be present in the project area. The number of anadromous fish using Knik Arm on an annual basis is unknown, but conservatively, hundreds of thousands of adult anadromous fish migrate through the Arm on their way to natal streams; millions of juvenile fish migrate through Knik Arm from those streams natal streams to marine waters. Anadromous fish in Upper Cook Inlet support vital and productive personal use, sport and commercial fisheries and these fish also provide a critical component of a productive ecosystem.

A commonly-held belief, although based on little data, has been that both adult and juvenile anadromous fish quickly migrated through the turbid waters of Knik Arm and that it had little habitat value. While there are relatively little data about fish use of Knik Arm, a 1983 Alaska Department of Transportation study (Morsell et al. 1983) and recent studies by the Knik Arm Bridge and Toll Authority (KABATA) and the POA have provided additional information. Results from these studies revealed the presence of over 20 species of fish, including 5 species of salmon, in Knik Arm. Preliminary indications are that Knik Arm is used by adult anadromous fish throughout the summer months. Furthermore, the Arm is used by juvenile salmon throughout the ice free months (when sampling was conducted) and these fish feed and reside in the Arm for an unknown period of time. Based on the best available information provided as a result of the limited sampling program conducted by the POA and KABATA, it appears that fish diversity and abundance are surprisingly high for an area with such a harsh environment. Further, it appears that the potential importance of Knik Arm as a nursery area for juvenile anadromous fish may be more important than previously thought. However, we still know little about the specifics of juvenile fish use of Knik Arm, including: timing of entry into the Arm; duration of residence time; size and growth rate during early marine residence; distribution, by habitat type and area; feeding behavior; and availability of prey.

Comments and Recommendations

Phase 1. As currently described in the public notice, the Corps would only authorize Phase 1 of the overall project. While the Service is concerned about the overall project design and potential for adverse effects (as described further below), we believe authorization of Phase 1 does not constrain the range of alternatives which are possible in the future. Consequently, we have no objection to permit issuance for Phase 1 provided the following recommendations to mitigate potential adverse environmental impacts are implemented prior to issuing the permit for Phase 1.

1. A conceptual mitigation plan is prepared for review and comment by agencies (including the Service, National Marine Fisheries Service, Environmental Protection Agency, Alaska Department of Fish and Game, Alaska Department of Natural Resource, and the Alaska Department of Environmental Conservation), and approval by the Corps. The conceptual plan would outline how compensation would be accomplished for potential, overall project-related impacts that cannot be avoided or minimized, with more specific

information regarding potential impacts associated with Phase 1. The conceptual mitigation plan would include clear goals and measurable objectives, along with milestone dates for the submittal of reports which will indicate the progress of those objectives for each phase of the project. This concept has been used successfully on previous projects (most recently the Cooper Lake Hydroelectric Project) and provides a roadmap for future permitting, studies, and mitigation actions to help ensure that expectations of all stakeholders are identified and addressed.

2. No permit is issued for Phase 1 until a mitigation account has been established and in-lieu fees have been deposited into this deposited for Phase 1.

Remaining Project Phases. The overall project as proposed would result in the filling or dredging of 421 acres of intertidal or subtidal habitat, as well as the loss of over 1.5 miles of shallow shoreline. Existing scientific literature indicates that juvenile salmonids inhabit and move along nearshore, shallow water areas because they provide food, refuge from predators, and a transition zone to physiologically adapt to salt water existence. Because there is little information presently available about juvenile and adult anadromous fish use of specific habitats in Knik Arm, it is difficult to predict the potential project impacts. However, scientific studies in the Pacific Northwest do provide information which we believe is relevant to an understanding of potential project effects on anadromous fish. We have included information which we believe is pertinent about anadromous fish use of Pacific Northwest estuarine and nearshore habitats (see attachment).

We believe that the most significant project-related impact is the potential for adverse effects on fish movement and migration, in addition to direct habitat loss. Based upon existing literature, we believe it is likely that shallow, littoral habitat in Knik Arm is used as a migration corridor for juvenile salmon, providing refuge from strong tidal currents and predators, as well as feeding habitat, but this has not been documented. In addition, according to the fisheries consultant retained for the KABATA and POA projects, adult salmon may use the shallow littoral zone to escape predation by Beluga whales.

In our view, it was premature for MARAD to submit the final EA to the Corps with a finding of no significant impact since the EA does not sufficiently describe known information about biological resources, nor does it sufficiently evaluate the potential impacts to those resources. For example, the EA lacks a discussion of potential project impacts on fish migration and movement. Furthermore, the fisheries consultant for both POA and KABATA has not completed the data collection, and data to support some of the key, outstanding questions have yet to be collected. Moreover, preliminary data collected to date have not been summarized and provided to agencies for review and discussion. Because the fish studies are ongoing, it is premature to draw definitive conclusions regarding anadromous fish use of Knik Arm, or project effects on anadromous fish. Consequently, we believe that conclusions about marine resources in the EA are not sufficiently supported by data or existing literature; hence, subsequent statements about the nonsignificance of project impacts may not be valid.

Due to time and funding constraints, and difficult conditions in Knik Arm, we recognize a definitive study of the effects of existing structures on fish movement and migration is not currently possible. However, we believe the ability to answer outstanding questions and address deficiencies in the EA can be improved through several means. First, on-going fish studies need to be completed (which we understand will extend through 2005), and the entire data set needs to be summarized and made available for review and discussion. To date, neither an analysis nor summary of the data from the POA nor KABATA have yet been provided. Given the geographic proximity of the projects, we believe that sharing the data from both projects is important and will increase understanding of the Knik Arm system. Second, it is our understanding that the 2005 sampling plan involves sampling deeper waters to supplement the existing data, which included sampling limited to nearshore fish assemblages through the use of beach seines. These data will provide important information necessary to address key questions about the relationship between water depth and movement of different species and age-classes of fish. Additional data yet to be analyzed is from the collection of otoliths from fish believed to be produced from nearby hatcheries. These data could provide insight about movement patterns of juveniles. In addition, mitigation funds from the Port MacKenzie development are being used to examine fish movement in front of the dock face. We believe this study, scheduled to be complete in 2005, may provide information that will help predict the effects of future dock developments.

Once the studies and analyses recommended above have been completed and reviewed, additional National Environmental Policy Act (NEPA) evaluation may be necessary. We would appreciate the opportunity for additional involvement and dialogue during data collection, review, and analysis. Our goal is to first avoid and minimize impacts to the extent practicable, and then discuss in-kind, on-site compensatory mitigation for any remaining, unavoidable impacts.

Thank you for the opportunity to provide recommendations. If you have any questions regarding these recommendations, please contact project biologist Phil Brna at 271-2440, or by email at phil_brna@fws.gov.

Sincerely,

Ann G. Rappoport
Field Supervisor

cc: R. Graves, POA
R. Willis, ADF&G
M. Miller, ADF&G
S. Seaberg, DNR
H. Dean, EPA
L. Peltz, NMFS
B. Lance, NMFS
M. Langdon, ADEC
T. Tobish, MOA
M. Carter, MARAD
D. Yuska, MARAD

ATTACHMENT

Importance of Nearshore Marine and Estuarine Habitat to Juvenile Salmon in the Pacific Northwest

Salmon in the Pacific Northwest are often used as biological indicators for the ecological health of an area because they integrate a variety of habitats throughout their life history. Their functional relationships with other species in estuarine and nearshore marine zones provide some measure of the interconnectedness of these habitats (Simenstad and Cordell 2000). Likewise, estuarine and nearshore marine habitats are integral to the survival and growth of salmonids and many other fish and wildlife species (Simenstad 1983, Simenstad et al. 1991a, Thom 1987, Spence et al. 1996), and these functions may be compromised by shoreline modifications.

Juvenile salmon move along the shallows of estuaries and nearshore areas during their outmigration to the sea, and may be found in these habitats throughout the year depending on species, stock, and life history stage (Emmett et al. 1991, Spence et al. 1996). Shallow estuarine and nearshore habitats are structurally complex (e.g., submerged aquatic vegetation and large woody debris), highly productive, and dynamic. As such, they are critical areas for juvenile salmonids because they provide food, refuge from predators, and a transition zone in which juvenile salmon physiologically adapt as they move from fresh water to a salt water existence (Mason 1970, Macdonald et al. 1987, Thorpe 1994, Levings 1994, Spence et al. 1996). Juvenile salmonids behaviorally restrict their movements to shallow water (between 0.1 and 2.0 m) until they reach larger sizes that may allow them to exploit deeper channel and open-water habitats, and associated prey resources. Returning adult salmon and some resident stocks use nearshore habitats as feeding areas where they consume forage fish such as Pacific herring, surf smelt, and sand lance (Pentilla 1995, Brodeur 1990, Fresh et al. 1981).

Many of the declines in salmonid populations are likely attributable to urbanization and anthropogenic activities in nearshore marine and estuarine habitats (Schmitt et al. 1994). Loss of over 70 percent of Puget Sound coastal wetlands and estuaries to urban or agricultural development (diking, dredging, and hydromodification) has resulted in a massive reduction in rearing habitat for juveniles, especially estuarine-dependent chum and chinook salmon and cutthroat trout (Myers et al. 1998). Degradation and loss of shallow vegetated habitats may alter sheltered migration corridors for juveniles of all species (Simenstad et al. 1982). Declines in woody debris in estuaries and shoreline alterations have likely resulted in detrimental effects to juvenile fish in many of their resident and migratory stages, due to a reduction in refuge and feeding sites (Johnson et al. 1999). Shoreline armoring, over-water structures that shade marine vegetation and alter primary productivity, filling, channel dredging, and pollution from upland commercial, industrial, and residential development may also be contributing to the declines.

One of the few studies to actually document fish behavior in the presence of bulkheads involved observations of salmon fry from a small boat (Heiser and Finn Jr. 1970). Heiser and Finn (1970) found large concentrations of small (35-mm to 45-mm) pink and chum salmon fry in protected marinas. Salmon fry exhibited schooling and predator avoidance behaviors, suggesting they were responding to bulkhead and breakwater structural design elements and were apparently reluctant to move into deeper water to go around the bulkhead. The study recommended the use of breakwaters with a shallow angle of repose (45 degrees or less) instead of vertical walls. Although a fairly minor observational study, Heiser and Finn (1970) appears to have been influential in establishing subsequent shoreline stabilization design criteria for the region. It is included in most literature reviews documenting the effects of shoreline modifications on biological resources (Kahler et al. 2000, Mulvihill et al. 1980, Simenstad et al. 1991b, Thom et al. 1994).

Alterations to nearshore hydrology affect local sediment conditions, which can affect habitat structure. Changes can be manifested as loss or increase in sediment supply to an area, or altered flow rates which change the sediment grain size, which can be important to the types and number of plants and animals found in an area. For example, increased erosion of adjacent shorelines and littoral drift alteration modifies food and cover for transient and resident species, thereby reducing diversity and densities of locally adapted populations.

Shoreline armoring may affect the recognized functions of estuarine and nearshore habitats for juvenile salmon. Migration can be affected because construction of the structure itself may inhibit or alter migration pathways, and loss or simplification of intertidal habitat exposes juveniles to predators in deepwater habitats. Juvenile food production and feeding can be impacted because changed wave energy regimes and tidal currents can affect the production of prey by altering substrate conditions, water properties, and hydrologic conditions. According to Shipman and Canning (1993), the adverse environmental impacts associated with a single shoreline stabilization structure may not always be great. However, there is a growing concern regarding the cumulative ecological effects of shoreline armoring.

A preponderance of evidence exists to link the effects of shoreline modifications to changes in nearshore biological functions, although this evidence is primarily drawn from an inference-based conceptual understanding of nearshore ecosystem processes. Shoreline modifications exert effects at varying degrees on an ecosystem's controlling factors (e.g., water depth, substrate type, light level, and wave energy). Impacts that affect controlling factors within an ecosystem may be reflected in changes to habitat structure, and ultimately may be manifested as changes to functions supported by the habitat. For example, the composition of benthic substrate in nearshore marine and estuarine habitats is linked to local physical conditions and greatly influences biological resource functional benefits. Several documents summarize the physical factors controlling habitat structure (Dethier et al. 1990), and the relationship between "natural" predevelopment) estuarine and nearshore habitats and major aquatic resources in Washington State (Simenstad et al. 1991a). Shoreline modification and restoration can have direct, indirect and cumulative impacts to estuarine and nearshore marine biological resources at a site, as well as in areas well beyond the location of the modifications. Effects appear to be highly site, habitat, and scale-dependent, and depend upon the level of disturbance and the relative sensitivity of the habitat to the disturbance. It is difficult to accurately generalize a finding from one site to another site. From a landscape perspective, the cumulative impact of losses in connectivity between natural nearshore and estuarine habitats remains difficult to measure and test.

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

March 22, 2006

Colonel Timothy J. Gallagher
U.S. Army Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Re: POA-2003-502-N, Ship Creek

Dear Colonel Gallagher:

The National Marine Fisheries Service (NMFS) has reviewed the Public Notice for the Port of Anchorage expansion project. As proposed, the complete project using the applicant's preferred alternative (open-cell, sheet-pile design) would discharge fill material over approximately 135 acres of intertidal and subtidal waters of upper Cook Inlet and dredge an additional 235 acres. Phase I of the project was permitted previously and encompasses 27 acres of intertidal fill area on the north end of the port. This Public Notice (Phase II) would permit the discharge of approximately 9.4 million cubic yards of material over the remaining 108 acres of intertidal and subtidal habitat and the dredging of approximately 633,000 cubic yards of material over approximately 47 acres for the construction of the proposed sheet-pile dock. To obtain fill material, an additional 34.5 acres of wetlands would be impacted by development of the Cherry Hill and North End borrow pits. The Maritime Administration (MARAD) completed an Environmental Assessment for the port project and a separate Environmental Assessment for use of the borrow pits.

The Port of Anchorage expansion project is undeniably important to the city and state. NMFS is concerned, however, that the project as proposed does not minimize impacts to valuable habitat for fish and beluga whales in upper Cook Inlet. NMFS offers the following comments and recommendations pursuant to the Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and Marine Mammal Protection Act (MMPA).

Effects on NMFS Trust Resources

Fish and Essential Fish Habitat

Fish habitats in upper Cook Inlet have not been studied comprehensively, but the studies completed to date indicate that the area immediately around the Port of Anchorage supports a wide diversity of marine and anadromous fish species. These species include some that are targeted directly by recreational and commercial fisheries and others that serve as prey for larger fish and marine mammals. Studies completed for this project (Pentec 2005a) and the proposed Knik Arm bridge (Pentec 2005b), as well as other studies in the vicinity (Dames and Moore 1983, Moulton 1996), document that shallow waters in this area provide migrating, rearing, and foraging habitat for all five species of Pacific salmon, saffron cod, and a variety of prey species such as eulachon and longfin smelt.

EXHIBIT I

March 22, 2006

Colonel Timothy J. Gallagher
U.S. Army Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

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Effects on NMFS Trust Resources

Fish and Essential Fish Habitat

Fish habitats in upper Cook Inlet have not been studied comprehensively, but the studies completed to date indicate that the area immediately around the Port of Anchorage supports a wide diversity of marine and anadromous fish species. These species include some that are targeted directly by recreational and commercial fisheries and others that serve as prey for larger fish and marine mammals. Studies completed for this project (Pentec 2005a) and the proposed Knik Arm bridge (Pentec 2005b), as well as other studies in the vicinity (Dames and Moore 1983, Moulton 1996), document that shallow waters in this area provide migrating, rearing, and foraging habitat for all five species of Pacific salmon, saffron cod, and a variety of prey species such as eulachon and longfin smelt.

NMFS and the North Pacific Fishery Management Council have identified Essential Fish Habitat (EFH) in waters of upper Cook Inlet for anadromous Pacific salmon. Under Section 305(b)(2) of the Magnuson-Stevens Act, federal agencies are required to consult with NMFS regarding any action that may adversely affect EFH. NMFS must provide conservation recommendations for actions that would adversely affect EFH, which may include measures to avoid, minimize, or offset adverse effects.

NMFS is particularly concerned about the potential consequences of the project for Chinook and coho salmon. Fish sampling conducted for this project and the proposed Knik Arm bridge (Pentec 2005a and Pentec 2005b) indicates that Chinook and coho salmon use the inshore habitat at the project site preferentially compared to other sampled habitats. Otoliths from juvenile Chinook salmon sampled between Cairn Point and Point Woronzof showed that 80 to 85% of the fish were of hatchery origin (interpolated from Table 12 of Pentec 2005a), suggesting that waters in this portion of upper Cook Inlet are very important to the hatchery produced Chinook salmon smolts from Ship Creek. The remaining 15 to 20% of the fish that were not of hatchery origin suggest that the port expansion area also provides important habitat for wild Chinook, likely including fish from other Knik Arm tributaries. Filling a large area of intertidal and subtidal habitat directly to the east and adjacent to the mouth of Ship Creek would adversely affect smolts exiting Ship Creek. These effects could be especially pronounced on incoming tides when the fish would be forced east and face nearly two miles of bulkheaded shoreline and deep water, rather than the existing shallower waters where they can acclimate and seek refuge. The port expansion as proposed would likely decrease the survival of juvenile salmon emanating from Ship Creek, potentially reducing adult salmon returns to the popular Ship Creek sport fishery. Further information regarding fish habitat at the project site and potential impacts is included in Enclosure A.

Project alternatives that reduce the amount of fill and incorporate a relatively shallow margin along the shore (even under a pile-supported platform) would reduce impacts to fish habitat by retaining a sheltered migratory corridor for salmon and prey species. Minimizing the loss of fish habitat functions near the port would help support economically important recreational and commercial fisheries for salmon, as well as prey for beluga whales.

Cook Inlet Beluga Whales

The project area also provides high value beluga whale habitat, including summer feeding areas. The Cook Inlet beluga population is a small stock that has been shown to be geographically isolated (Laidre et al. 2000) and genetically distinct (O'Corry-Crowe et al. 1997) from other Alaskan beluga stocks. The Cook Inlet beluga's range appears to be largely confined to Cook Inlet (Rugh et al. 2000, 2005) with high-density concentrations in the upper Inlet. Since 1994, the Cook Inlet beluga population has declined significantly (Hobbs et al. 2000). The Cook Inlet beluga population was designated as depleted under the MMPA in 2000 (65 FR 34590). The latest survey information indicates that just 278 animals comprise the population. NMFS is currently undertaking a status review of the Cook Inlet beluga stock to determine whether this population should be listed under the Endangered Species Act.

The Port of Anchorage expansion project would impact beluga whales directly due to loss of intertidal and subtidal habitat, plus degradation of habitat due to increased noise that could cause injury or disrupt feeding activity. The project would also contribute substantially to the cumulative impacts on Cook Inlet belugas and their habitat (see discussion in Enclosure B).

The Environmental Assessment indicates that the project would require work that can increase the level of in-water sounds to the degree that beluga whales may be harassed or injured due to exposure to high noise levels. Due to the occurrence of these whales in the project area, often within the footprint of the proposed port expansion, and because of the sensitivity of beluga whales to received noise levels, this project has a significant probability of "taking" these marine mammals. Any such taking would violate the MMPA, unless specifically authorized. The MMPA provides for the authorization of unintentional and incidental takes of small numbers of marine mammals. NMFS and the applicant are currently discussing MMPA authorization for this work. Therefore, the recommendations regarding beluga whales in this letter are premised on the assumption that the project will be operating under an MMPA Small Take Authorization.

Alternatives Analysis

In previous letters to MARAD and the Corps of Engineers dated September 17, 2004, December 9, 2004, April 7, 2005, and June 1, 2005, NMFS has consistently recommended pursuing an alternative design for the project that would reduce impacts to living marine resources. An objective, rigorous analysis of alternatives and their associated impacts is necessary for the Corps to identify the least environmentally damaging practicable alternative, which is the only option the Corps can permit under the Clean Water Act section 404(b)(1) guidelines. The applicant's preferred alternative would eliminate and degrade a very large area of habitat used by beluga whales, salmon, and forage fish. Alternative designs that incorporate a partially pile-supported wharf would reduce the amount of fill needed for the project and maintain shallow water habitat near shore. NMFS has reviewed the Environmental Assessment, Public Notice, and other project related information provided by the Corps and MARAD. The analysis to date does not demonstrate that a partially pile-supported alternative is not practicable.

NMFS has repeatedly recommended the use of a partially pile-supported design such as Alternative B in the Environmental Assessment or the Pile-Supported Dock with Slope (see Environmental Assessment page 2-30). Such a design would minimize the loss of nearshore habitat and provide shallow water refuge for out-migrating juvenile salmon and adults. MARAD and the Port of Anchorage have contended that pile-supported options are not viable, based in part on issues of seismic stability. However, NMFS understands that there is considerable disagreement within the engineering community regarding the seismic stability of the applicant's preferred alternative, as well as MARAD's conclusions regarding a pile-supported design (Chapman and Fernandez 2002, Moffatt and Nichol Engineers 2002, Geotechnical Advisory Commission 2005).

A March 2006 overview of the geotechnical design process, compiled by MARAD, summarizes discussions and analyses related to the design from 2003 through June 2005 (MARAD 2006). The overview notes that a number of parties have been involved in discussions related to the design, and a final project design has not been completed. It also states that both a solid fill design and a pile-supported design would be stable under probable seismic events. Additionally, the document notes that MARAD is preparing a formal response to an August 15, 2005, letter from the Anchorage Geotechnical Advisory Commission (GAC) that reiterated concerns about the project design and called for an independent third party review.

NMFS has no expertise in geotechnical matters related to the port's design, but we are interested in clarifying the project design issues insofar as that helps inform the identification of the least environmentally damaging practicable alternative for the project. The August 15, 2005, letter from the GAC suggests that engineering professionals still have many questions about the project design. NMFS therefore supports an independent third party review to assist the Corps in evaluating the practicability of less damaging designs for the project. NMFS recommends that the Corps and MARAD jointly select the review panel in concert with the GAC, thereby removing the Port of Anchorage and its consultants from that role. NMFS understands the GAC (comprised of volunteers from various engineering firms in Anchorage) is interested in being involved in some capacity and would lend valuable local expertise for any review panel, such as one developed via the American Society of Civil Engineers committee on seismic design standards for container ports. Resolving questions about the design alternatives via a clearly independent review would greatly benefit the public review process for this important project.

Compensatory Mitigation

The proposed project would eliminate a very large area of intertidal and subtidal habitat, regardless of what design alternative is selected. The Public Notice states that the applicant proposes to compensate for unavoidable impacts by establishing a mitigation account to support and enhance salmon restoration programs under the Pacific Salmon Recovery Fund. As discussed during a February 9, 2006, interagency meeting regarding the project, decisions regarding the specific mitigation projects to be undertaken should be made by the Corps using an interagency committee to ensure that funds are directed to suitable projects to benefit the resources affected by the port expansion. NMFS recommends that the mitigation projects prioritize restoration or protection of estuarine habitat, and that some of the selected projects be designed to benefit beluga whales, in addition to salmon.

Conservation Recommendations

NMFS offers the following recommendations for the project to minimize impacts to living marine resources. Recommendations #1-5 are EFH Conservation Recommendations pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act. Please note that under section 305(b)(4)(B) of the Magnuson-Stevens Act, the Corps is required to respond in writing within 30 days to NMFS EFH Conservation Recommendations. If the Corps does not make a decision within 30 days, you should provide NMFS with a letter to that effect, and indicate when a full response will be provided. Recommendations #6-7 are specific to beluga whales. In addition to the special conditions requested below, NMFS requests that all the recommendations regarding belugas in Enclosure B be included as special conditions to the Corps permit.

1. The Corps should deny a permit for the proposed project because the applicant has not demonstrated that its preferred alternative is the least environmentally damaging practicable

design. Alternatively, the Corps should defer its decision on the permit application pending the completion of a more comprehensive alternatives analysis to evaluate design options to reduce impacts to intertidal and subtidal habitats (see #2 below).

2. The Corps should require the applicant to provide an independent third party review of geotechnical considerations related to the project design. Such a review would assist the Corps in evaluating the practicability of partially pile-supported alternatives that involve less intertidal and subtidal fill than the applicant's preferred alternative. This additional information is necessary for the Corps to complete a thorough alternatives analysis to identify the least environmentally damaging practicable alternative for the project. The Environmental Assessment prepared by MARAD does not analyze alternative designs in sufficient detail to respond to the requirements of the 404(b)(1) Guidelines, and should be supplemented with a more comprehensive analysis as envisioned by 40 CFR 230.10(a)(4). The Corps should require Corps approval (in consultation with NMFS and other appropriate agencies) of the membership of the independent review panel and the process for conducting the review.

3. To minimize adverse effects of noise from construction and operation of the project, the Corps should require the applicant to develop an underwater noise reduction plan for approval by the Corps in consultation with NMFS and other appropriate agencies. The plan should incorporate measures such as timing windows, structural designs, operational procedures, and other methods to reduce adverse effects on fish and other living marine resources. For example, the plan should include a requirement for piles to be driven with a vibratory hammer to the maximum extent practicable, and if an impact hammer is required because of substrate type or the need for seismic stability, piles should be driven as deep as possible with a vibratory hammer before the impact hammer is used.

4. The final project design should incorporate state-of-the-art treatment for stormwater runoff from the expanded port facility to reduce degradation of upper Cook Inlet from hydrocarbons and other pollutants stemming from port operations.

5. No permit should be issued for Phase II until the Corps, NMFS, and other appropriate agencies have agreed upon a complete mitigation plan for the project. If the mitigation plan includes establishment of a fund to support future mitigation projects, the plan should specify the amount of funding, the types of projects to be funded, the resources that should benefit from selected projects, and the process for selecting and approving projects.

6. In-water pile driving (i.e., excluding work when the entire pile is out of the water due to shoreline elevation or tidal stage) should not occur within two hours on either side of each low tide to reduce impacts to beluga whales.

7. Belugas should not be exposed to sound levels in excess of 180 dB re: 1μPa. The radius surrounding such noise sources should be determined empirically and established based on propagation loss equations using data specific to this project. (If no Small Take Authorization under section 101(a)(5) of the MMPA is obtained, Cook Inlet beluga whales should not be exposed to noise in excess of 160 dB re: 1μPa.)

Conclusion

In summary, NMFS opposes issuance of a permit for the applicant's preferred alternative of a sheet pile dock with 135 acres of fill because the information we have reviewed does not demonstrate that this is the least damaging practicable alternative. The project as proposed will have substantial and unacceptable impacts to aquatic resources of national importance, as defined in Part IV paragraph 3(b) of the Clean Water Act section 404(q) Memorandum of Agreement between the Department of Commerce and the Department of the Army. Unless all of our recommended conservation recommendations for EFH and Cook Inlet beluga whales are followed, we recommend that you deny the requested permit. If you decide to issue the permit over our objections, we may seek higher level review of your decision pursuant to the 404(q) Memorandum of Agreement.

If you have questions regarding EFH or fish resources, please contact Brian Lance at (907) 271-1301 or Larry Peltz at (907) 271-1332. If you have questions regarding beluga issues, please contact Barbara Mahoney at (907) 271-3448.

Sincerely,

Robert D. Mecum
Acting Administrator, Alaska Region

Enclosures (2)

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NATIONAL MARINE FISHERIES SERVICE
ENCLOSURE A

Impacts to Fish and EFH from the Port of Anchorage Expansion Project

Background

The project area provides rearing and migratory habitat for several streams that drain into Knik Arm, in upper Cook Inlet. The nearshore habitat at the project site is important to all these streams, especially Ship Creek. Historically Ship Creek was one of the top two salmon-producing waterways in the Anchorage Bowl. Currently it contributes a large number of wild salmon and much of the hatchery produced salmon in Knik Arm. Ship Creek is one of the few urban salmon fisheries in the nation. The number of angler days of effort spent on Ship Creek (average of 50,000 from 1998 to 2002) is exceeded in Alaska only by the Kenai River. The average economic effect for the Ship Creek fishery is estimated at $7.3 million annually (Northern Economics 2004).

Assessment of Impacts

The Port of Anchorage expansion project will impact fish in Cook Inlet. While there may be few definitive studies on the use of the nearshore shallow coastal areas in the upper Inlet, use of this type of habitat elsewhere by salmon and other species is well supported by the literature (Groot and Margolis 1991). The Pentec studies conducted for this project suggest "juvenile salmonids in Knik Arm are not as dependent on littoral habitats as are the same species elsewhere." NMFS interprets the available data differently. NMFS review of historical documents related to fish studies in upper Cook Inlet (including Dames and Moore 1983 and Moulton 1996) and more recent studies (Pentec 2005a and Pentec 2005b) leads us to conclude that a wide variety of fish species are present in the vicinity of the Port of Anchorage and use the habitat in the near shore zone.

Based on our review of the available data, NMFS is particularly concerned about potential effects of the project on juvenile Chinook and coho salmon, which appear to prefer the intertidal habitat. Juvenile Chinook salmon otoliths sampled between Cairn Point and Point Woronzof showed that 80 to 85 percent of the fish were of hatchery origin (Table 12 Pentec 2005a). The large component of hatchery fish indicates to NMFS this area is important to the hatchery produced Chinook salmon smolt released from Ship Creek. In other areas, juvenile Chinook salmon stay in their natal estuary for varying periods of time (Healey 1991). It is reasonable to assume the intertidal area east and west of the mouth of Ship Creek is part of the functional Ship Creek estuary, and thus serves as a transitional habitat for salmon migrating from fresh to salt water. Loss of 9,000 linear feet of intertidal area to the east and directly adjacent to Ship Creek would mean that a Chinook salmon smolt exiting Ship Creek during an incoming tide would be forced east and not have any intertidal area in which to adjust and seek refuge while it acclimates to saltwater and begins to feed on marine organisms. If the port expansion proceeds as proposed, NMFS anticipates that survival rates will decrease for these smolts.

NMFS disagrees in part with the assertion from the Pentec studies that the tow net sampling suggests that fish utilize all of Knik Arm and are not necessarily oriented to the shoreline. A direct comparison of the Port of Anchorage tow netting and beach seining data and the beach seining data collected for the proposed Knik Arm bridge suggests a shoreline preference for some species (Table 1 below). Based on the catch data from near shore and off shore sampling, chum, pink, and sockeye salmon do appear randomly distributed across Knik Arm. However, Chinook and coho salmon are much more abundant in the shoreline sampling, suggesting that those species use the intertidal area preferentially. This comparison suggests Chinook and coho salmon may rely upon the intertidal area as they make the transition from freshwater to saltwater.

The Pentec studies observe that after July, the large numbers of juvenile salmon collected appeared to be mostly young of the year coho and sockeye salmon. NMFS is concerned that this information may be misleading. Coho salmon fry that enter the sea in the first spring or summer of life are generally not thought to survive to the adult stage (Groot and Margolis 1991). This may be true for sockeye salmon too. Consequently, although abundant, these fish may not be nearly as important as the smolt present earlier in the year. If protecting juvenile fish during construction becomes an issue, priority should be given to the juveniles present from April 15 to July 15. After July 15, it is questionable whether the large numbers of juveniles present result in many returning adult salmon.

Potential Impacts to Fish Resources

Overview
The impact area from the proposed Port of Anchorage expansion constitutes a component of what remains of the Ship Creek estuary. The Ship Creek estuary has largely been filled in and channelized to accommodate growth of an industrial district. The relative productivity of the estuary has most likely been severely reduced from its original state. The small part of the original estuary and its surrounding area that still exists in a functional state has high ecological value. The 9,000 linear feet of shoreline included in the proposed port expansion is a functional component of the remaining estuary. The loss of the functions served by this area cannot be replaced.

Project impacts can be divided into short-term impacts resulting from construction and long-term impacts from the dock expansion. Short-term impacts are habitat destruction and damage to fish primarily related to filling intertidal and subtidal areas, as well as noise associated with pile driving. It is debatable whether the seven-year construction period for the port expansion can be considered short-term. Continuous damage over a seven-year period could result in a long-term impact to species with shorter life cycles. Long-term impacts are permanent habitat alteration and destruction and the resulting negative impact on fish. The cumulative effects of this project on both juvenile and adult anadromous fish, when combined with other projects proposed in upper Cook Inlet as well as rapid development in the Mat-Su Borough, can be expected to result in significant declines in anadromous fish populations over time. This could have serious ecological and economic consequences. In short, the Port of Anchorage expansion project together with other proposed and potential development in upper Cook Inlet could result in significant cumulative impacts to anadromous fish.

Fill

The Port of Anchorage expansion project would fill approximately 135 acres and eliminate approximately 9,000 linear feet of intertidal habitat. Dumping fill into waters where fish are present can kill, injure and isolate fish in the discharge area. Injured and isolated fish are subject to increased predation (birds), disease, decreased feeding efficiency and/or death from subsequent fills.

Pile Driving

Numerous studies have shown that pile driving can kill and injure fish (Hastings and Popper 2005). The proposed port construction would require driving sheet pilings across the face of the 9,000-foot dock expansion. The pile driving would occur over an extended period of time. Since fish were found in the project area during the entire period sampled, the potential for significant impact to fish from noise is unavoidable. High turbidity and currents make the impact nearly impossible to monitor and/or document. This is a short-term impact. However, due to the seven year projected construction window, uncontrolled and unmonitored pile driving could have a long-term negative impact on juvenile salmon survival.

Habitat Alteration

The elimination of 135 acres of intertidal and subtidal habitat for the port expansion, spanning 9,000 linear feet of shoreline, would likely cause substantial habitat changes in this portion of Knik Arm. A 9,000 foot long dock face would replace existing areas of shallow slow moving water with deep fast moving water across a sheer sheet pile face. The sheltered areas of slower moving water where juvenile fish tend to be more abundant would be eliminated. The clearer water microhabitats in the intertidal area that allow for visual feeding also would be eliminated. This habitat alteration would negatively impact Chinook and coho salmon juveniles that now use the intertidal area by displacing the fish from a preferred habitat and eliminating a feeding area. The degree of the impact to fish populations is difficult to quantify. The impact would be long-term (once the habitat is stabilized a net negative impact persists) and would most likely decrease survival of juvenile fish emanating from Ship Creek. This, in turn, would reduce the number of adult salmon returning to Ship Creek and available to sport fisheries. Ship Creek supported an average of over 50,000 days of angler effort per year from 1998 to 2002 (Alaska Department of Fish and Game). The Ship Creek fishery average yearly economic effect was estimated at $7.3 million (Northern Economics Inc.), meaning Ship Creek anglers pumped over $36 million into the Alaska economy during this five-year period. Any negative impacts to the Ship Creek fishery would have negative economic implications to the Alaska economy.

Table 1: Knik Arm Fish Sampling Comparisons. CPUE Data Comparison, Juvenile Salmon, Beach Seines versus Tow Nets. Data from Pentec 2005a Report - Table 4 and Table 6, Pentec 2005b Table 7 and Table 9.

	Littoral / Nearshore Habitat		Offshore Habitat	
CPUE	**POA 2004/2005 Beach Seines**	**KABATA 2005 120-foot Beach Seines**	**POA 2005 Tow Net Transects**	**KABATA 2005 Tow Net Transects**
Juvenile Chinook	0.84	1.3	0	0.2
Juvenile Chum	0.33	1.0	0	2.5
Juvenile Coho	1.86	1.6	0.1	0.3
Juvenile Pink	0.06	0.2	0	1.3
Juvenile Sockeye	0.42	1.1	0	2.4

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NATIONAL MARIEN FISHERIES SERVICE
ENCLOSURE B

Cook Inlet Beluga Whales and the Port of Anchorage Expansion Project

The Port of Anchorage construction and operation will result in the direct elimination of beluga habitat through filling, and diminishment of habitat value through physical and acoustic alteration. The expanded port would entail the discharge of fill materials into approximately 135 acres of intertidal and subtidal waters. Construction and operational dredging would impact an additional 235 acres of Knik Arm, for a total of 370 affected acres within important habitat for the Cook Inlet beluga. It is possible that belugas may abandon important nearshore habitat south of Cairn Point due to the alteration and reduction of available habitat by the port expansion project. The port expansion project may also restrict or discourage transit of whales through Cairn Point narrows to important feeding areas in upper Knik Arm.

NMFS evaluated beluga habitat in Cook Inlet within the 2005 draft "Conservation Plan for the Cook Inlet Beluga Whale (Delphinapterus leucas)." The draft Conservation Plan established four beluga whale habitat classifications within Cook Inlet:

1. Type 1 Habitat is defined as "High Value/High Sensitivity" and includes what NMFS believes to be the most important and sensitive areas of the Inlet relative to beluga habitat requirements. Type 1 Habitat includes feeding areas throughout the upper Inlet, principally near several important anadromous fish streams. Belugas tend to concentrate in dense groups in the shallow waters of Type 1 Habitat (Rugh et al. 2005), making them vulnerable to disturbance.
2. Type 2 Habitat is defined as "High Value" and includes summer feeding areas and winter habitats in waters where belugas typically occur in lower concentrations or less frequently than in Type 1 Habitat. Type 2 Habitat generally contains areas with deeper waters, where belugas may be less prone to harassment and disturbance. Type 2 Habitat is comprised of seasonally important foraging sites and transitional corridors for access to Type 1 Habitats. The proposed 370 total acres to be filled or altered by the Port of Anchorage expansion project is located within Type 2 Habitat.
3. Type 3 Habitat occurs in offshore areas of the mid and upper Inlet and also includes wintering habitat as described by the results of satellite tagging research (Hobbs et al. 2005). Belugas are less commonly seen in Type 3 Habitat, but the areas are still used enough to be considered a relatively important resource for the whales.
4. Type 4 Habitat describes the remaining portions of the range of belugas within Cook Inlet. In Type 4 Habitat, belugas are seen occasionally or have been reported in the past, but they are not seen as often as in the other habitat types.

The draft Conservation Plan establishes two planning objectives for beluga habitat: 1) preservation of Type 1 Habitat, and 2) conservation of all beluga habitat types. Accordingly, the Type 2 Habitat planning objective is no net loss of habitat function or value. Noise associated with construction and operation of the expanded port is the aspect of the project that poses the greatest threat to the Cook Inlet beluga stock. Thus, minimization of construction and operation noise would accrue the most benefit to the conservation of belugas and their habitat.

Various sources provide information and environmental data concerning beluga use of the project area (lower Knik Arm), the remainder of Knik Arm, and the rest of upper Cook Inlet (Goetz 2005; Rugh et al. 2000, 2005; POA unpublished data; LGL unpublished data). These data demonstrate that Knik Arm waters are used intensively by belugas and verify feeding and travel behavior within the project area for the port expansion. Studies conducted for the Port of Anchorage (Markowitz, memos to W.E. Humphries, August, September, October and November 2005) reported that 79% of the total number of belugas observed in study area were observed in the immediate footprint of the port expansion project. These belugas exhibited various behaviors such as traveling, feeding, suspected feeding, and diving. A group of 23 whales was observed feeding or suspected feeding 89% of the time (Markowitz, memos to W.E. Humphries, August, September, October and November 2005).

NMFS aerial survey data (Rugh et al. 2000, 2005) show high use of Knik Arm by belugas when surveys were flown, primarily in June of each year. The Knik Arm Crossing beluga studies (Funk et al. 2005) report that Knik Arm was used by belugas throughout the year (with the exception of February) with high concentrations during August through November. Funk et al. (2005) also reported that belugas were concentrated in lower Knik Arm during spring. Interestingly, some observational data (Rugh et al. 2000, 2005; LGL unpublished data) indicate decreased sighting rates for waters off the Port of Anchorage, as compared with upper Knik Arm and areas to the south and west along upper Cook Inlet (e.g. Chickaloon River, Susitna River, and Little Susitna River). This may imply that lower Knik Arm activities, including the Port of Anchorage, may already have an impact on beluga behavior and habitat use. In this area, lower sighting rates may be a result of beluga response to relatively high noise levels, vessel activity, or related anthropogenic factors. Satellite tracking data (Hobbs et al. 2005) provided evidence that these whales routinely transited between upper Knik Arm and elsewhere in Cook Inlet, moving through the project area. A multivariate habitat use model found the waters of lower Knik Arm, including the project site and adjacent waters, were high value and similar to habitat within upper Knik Arm and other Type 1 Habitat areas (Goetz 2005). This infers that the port expansion project area could be Type 1 Habitat but now is used less intensively by belugas (i.e., it is now Type 2 Habitat). These modeling results suggest that when combined with current observations, development and industrial activity have already resulted in a tangible loss of Type 1 Habitat to belugas. If this change was attributable to underwater noise and the high level of maritime activity within lower Knik Arm, it is also reasonable to predict that the proposed port expansion would result in further diminishment of habitat value and use by belugas.

In addition to physical alteration and destruction of beluga whale habitat, the expansion project and future operation of the port would, without specific mitigation, increase noise levels within lower Knik Arm. Extensive research information describes the importance of sound to beluga whales for navigation and communication, as well as their hearing thresholds and behavioral reactions to noise (reviewed in Blackwell and Greene 2002). These reactions range from tolerance or apparent habituation to altered calling behavior (Lesage et al. 1999), reduced habitat use (Caron and Sergeant 1988), and acute reactions such as panicked flight (Finley et al. 1990; Erbe and Farmer 2000). NMFS has often observed Cook Inlet beluga whales' aversion to approaching small watercraft (NMFS unpublished data). Small boats emit high frequency noise that falls within the most sensitive hearing range of beluga whales (Blackwell and Greene 2002).

While larger vessels and certain port operations produce lower frequency noise which is less detectable to beluga whales, any such noise can affect these whales at high-received levels. According to the MARAD Environmental Assessment, the expanded port would increase annual ship arrivals from 491 (2003) to 763 (2025), accommodating much larger container ships (to 1,100 feet). A significant factor of additive noise would be associated with the port expansion construction, increased vessel traffic, loading/unloading activity, increased tug support, and increased dredging. Furthermore, the Port McKenzie vessel operations and construction and the proposed Knik Arm Crossing would have significant cumulative effects. Underwater noise reduction must be a primary planning element with respect to issuance of the Corps of Engineers permit for this work. Without effective underwater noise reduction during the construction period and expanded operations, NMFS considers the current environmental analysis inadequate.

NMFS commends the Port of Anchorage for monitoring belugas related to the project. Such monitoring must now be expanded to quantify the impacts of the port expansion and to enable decision makers to respond reasonably to future habitat development proposals. The feasibility-level monitoring studies (Markowitz memos to W.E. Humphries, August, September, October and November 2005) documented occurrence and distribution of beluga whales and described some behavior during operations. Beluga response to particular received levels of industrial noise is a key aspect missing from these studies. This information is needed to understand the extent and duration of effects from the port expansion and to ensure that necessary habitat values remain intact to provide opportunity for the recovery of the Cook Inlet beluga stock.

Following please find our recommended permit conditions for monitoring (as needed to validate the effectiveness of mitigation) and reporting necessary to protect beluga whales.

1. Monitoring

Monitoring the POA expansion project shall include A) beluga monitoring (to quantify the nature and extent of effects), B) noise monitoring (to quantify and predict the zones of beluga noise exposure for the major underwater noise sources associated with this project), and C) mitigation monitoring (to verify the shut-down of construction sources capable of injuring or reducing the hearing sensitivity of belugas). Integration of beluga, noise, and fish monitoring should be coordinated to the maximum extent practical. Integration will also be a key aspect to aid NMFS interpretation of the effects and determinations required under any Small Take Authorization under section 101(a)(5) of the MMPA. Annual draft reports shall be submitted in a timely manner to NMFS and key stakeholders for review.

A. Beluga monitoring:

As stated in the POA Marine Terminal Redevelopment EA, the applicant shall monitor beluga whales before, during, and one year after construction activities. Initial beluga observations were started in 2005. This monitoring effort requires: Shore-based observations by at least two teams to monitor the beluga whale movements, timing, group size, locations, and identifiable behaviors near the POA expansion area. The monitoring will be conducted from March through November (excluding the winter ice months). Beluga observation should be performed six hours per day, twice a week. The observers should attempt to monitor beluga whale presence or absence in addition to factors such as tide height, the relative location of active industrial noise sources, and vessels. Detailed observations should include specific localization of each sighting, individual coloration, group size, directional movement, stage and tide direction, behavior notes (slow vs. fast travel, direction vs. non-directional movements, etc.), and human activity (location and direction of ships, ship sizes, etc.) associated with the POA or within lower Knik Arm.

B. Acoustic Monitoring

The applicant shall record underwater frequency composition and sound pressure levels within lower Knik Arm during each construction year and one year after construction completion, beginning in 2006. The acoustic sampling frequency and duration should be developed each year in consultation with NMFS to measure broadband noise levels over a reasonable range of distances. Sampling design should account for multiple sources and paths along with specific noise sources anticipated to contribute a majority of the acoustic energy related to the project. Pile driving is expected to be the major source of impulsive construction noise, and as such, must be measured over a variety of distances to mitigate harassment of belugas, and to understand and predict future noise exposure estimates. Measurements must occur over several tidal cycles (due to significant alteration of water depth) and include periods representative of high use at the POA. Other specific activities important to record include vessel docking activities, tugboat assists, cargo transfers, maintenance and construction dredging, and other anthropogenic activities that are likely to introduce noise into the water. This monitoring shall be accomplished by trained acousticians approved by NMFS.

C. Mitigation Monitoring

Observers shall be on-site and observe all construction activities capable of producing received underwater sound pressure levels in excess of 160 dB re: 1µPa between 15 April and 1 December of each year for the duration of the project, and they shall direct operations to be suspended whenever one or more beluga are observed within, or about to enter the 180 dB zone. (If no Small Take Authorization under section 101(a)(5) of the MMPA is obtained, Cook Inlet beluga shall not be exposed to noise in excess of 160 dB re: 1µPa).

D. Integration

a. In the project area beluga presence is going to be influenced by the availability of prey, availability of escape terrain from predators, pile driving, vessel presence, background noise, reproductive status, season, and ice cover. Assessing the importance of these factors to the presence or absence of belugas in the project area will be best achieved through integration and collaboration among monitoring projects and other studies. When practical, beluga monitoring should occur coincident with noise and fish monitoring projects.

b. A GIS database shall be established in partnership with NMFS to manage and analyze the whale observations and other sources of beluga data relative to variables such as season, bathymetry, tide, and distance from POA activities.

2. Reporting

The applicant shall prepare a draft annual report, subject to NMFS review, describing the results of the beluga, acoustic, mitigation and integration monitoring efforts. These annual reports shall evaluate the effect of the POA expansion project construction and operations on Cook Inlet belugas. Annual monitoring reports are to be provided to NMFS no later than 1 March of each year.

At the end of every five-year period, a comprehensive report shall be prepared integrating the results from annual reports to determine inter-annual variability and cumulative effects. Reporting requirements under the MMPA section 101(a)(5) authorizations can be coordinated to prevent duplicative reporting.

A final comprehensive report shall be prepared integrating the results from all monitoring years (before construction, during construction activities, and one year after construction completion).

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U.S. FISH & WILDLIFE SERVICE

United States Department of the Interior

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

IN REPLY REFER TO:

AFWFO

MAR 17 2006

Colonel Timothy J. Gallagher
District Engineer, Alaska District
U. S. Army Corps of Engineers
Post Office Box 6898
Anchorage, Alaska 99506-6898

Re: Ship Creek
POA-2003-502-N

Dear Colonel Gallagher:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Corps of Engineers (Corps) public notice dated January 19, 2006, which describes a proposal by the Port of Anchorage (POA) and the U.S. Maritime Administration (MARAD) to expand and improve the Port of Anchorage. The port expansion project includes placing 9.4 million cubic yards of fill into 135 intertidal and subtidal acres, operational dredging of 235 subtidal acres, and constructing an 8,880-foot-long vertical sheet-pile dock face. Initial operational dredging is estimated to require removal of an estimated 3.9 million cubic yards of material from approximately 188 acres. Annual maintenance dredging quantities are estimated to range from 1.5 to 4.0 million cubic yards of material. Dredged materials will be discharged in Knik Arm. The project requires development of two material sites and haul roads that will result in disturbance of 381 acres, including destruction of 34.5 acres of wetlands. Phase 1 of the project was permitted by the Corps in 2005 and includes the discharge of 1,075,500 cubic yards of fill within a 27-acre intertidal area. Compensatory mitigation was required for phase 1. In total, the project will result in the disturbance and alteration of 751 acres of intertidal, subtidal, upland and wetland habitat. Project construction is expected to begin in 2006 and will take about 7 years to complete.

We support the 1998 vision of the Ship Creek Enhancement Citizens Advisory Task Force[1] that Ship Creek can, and should be, restored to its potential as a fully functioning, world-class urban salmon stream. Ship Creek and its fish resources will become the centerpiece of a vital downtown Anchorage and the gateway to Alaska for people from all over the world. We have been working in partnership with the Municipality of Anchorage and others to make this happen.

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[1] Ship Creek Enhancement Citizens Advisory Task Force. 1998. A Vision for Ship Creek Enhancement: Recommendations to the Mayor of Anchorage and the Alaska Railroad Corporation. Municipality of Anchorage, Heritage Land Bank. 51p.

EXHIBIT J

A restored Ship Creek is in the collective interest of both local residents and visitors and this is an integral part of a broader vision for a healthy environment, high quality of life, and vibrant economy. We are committed to this vision, and we must look at each separate development action in all Knik Arm watersheds and fully evaluate the effect of each proposal on the resources we value. The proposed project will adversely affect the potential for restoration of the Ship Creek watershed and a healthy and productive fishery because it will result in a loss of critical intertidal salmon rearing habitat. In combination with other potential projects, the Corps must consider the cumulative effects on fisheries, wildlife, water quality, and recreation opportunities in the Knik Arm. We recommend the Corps and the Municipality of Anchorage take the lead to objectively evaluate practicable alternatives that meet the needs for Port expansion while avoiding impacts on aquatic resources that will play a central role in the future restoration of Ship Creek.

We have been working with the Municipality of Anchorage, National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADF&G), Anchorage Waterways Council, and National Fish and Wildlife Foundation for several years to restore salmon and their habitat in Ship Creek. These efforts have included replacement of three failing culverts with a bridge at the mouth of Ship Creek, and implementation of streambank restoration and angler access in partnership with the Municipality's "Sustainable Salmon" initiative. We are working with ADF&G to develop and implement alternatives to existing dams that interfere with fish passage in Ship Creek. Millions of dollars have already been expended on these projects. Additionally, numerous fish passage and restoration projects have been implemented elsewhere on streams draining into Knik Arm. Our partners have included the native Village of Eklutna, the Chickaloon Village Traditional Council, the Mat-Su Borough, and the Great Land Trust. Initial funding of the National Fish Habitat Initiative, with a focus on Knik Arm and the Mat-Su Valley is being implemented this year by the Service in partnership with ADF&G, the Mat-Su Borough and the Nature Conservancy.

The project area supports juvenile salmon from a variety of Anchorage and Matanuska-Susitna (Mat-Su) area streams that drain into Knik Arm, in upper Cook Inlet. In particular, Ship Creek, immediately south of the project site, was historically one of the top two salmon-producing waterways in the Anchorage Bowl. It currently contributes a large number of wild salmon and the vast majority of hatchery produced salmon in Knik Arm. Nearshore habitat at the project site is critical to rearing salmon from all Knik Arm tributaries, especially Ship Creek. Ship Creek supports a unique salmon fishery in downtown Anchorage. The number of angler days of effort spent on Ship Creek (annual average of 50,000 from 1998 to 2002) is exceeded in Alaska only by the Kenai River. The average yearly economic effect for the Ship Creek fishery was estimated at $7.3 million annually (Northern Economics Inc.[2]).

Technical Assistance Comments under the Fish and Wildlife Coordination Act

Background

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[2] Northern Economics Inc. 2004. Hatchery Valuation Analysis – Final Memo. 19p.

In previous correspondence[3] to MARAD and the Corps, the Service provided comments about the: 1) sufficiency of the MARAD environmental assessment; 2) lack of definitive scientific data regarding use of Knik Arm by anadromous fish; 3) evaluation of practicable alternatives; 4) availability of measures to avoid and minimize impacts to anadromous fish; 5) need for compensatory mitigation where impacts cannot be avoided; and 6) importance of nearshore marine and estuarine habitat to juvenile and adult Pacific salmon. We worked with the Port, their consultant, and NMFS to define the scope of limited anadromous fish studies which were intended to provide basic information about fish use of Knik Arm. Much of this work was conducted in conjunction with studies being conducted by the Knik Arm Bridge and Toll Authority (KABATA). We also worked with the POA and KABATA to leverage mitigation money which was available from the Port McKenzie project to provide additional funding to answer questions about fish use of middle Knik Arm waters.

In June 2005, the Service supported the proposal for the Corps to approve phase 1 so that the POA could begin the expansion project without delay, because we believed phase 1 authorization would not constrain the range of alternatives which are possible in the future. We did this with the understanding that POA and MARAD would work with resource agencies and the concerned public to evaluate potential phase 2 alternatives to avoid and minimize adverse effects on anadromous fish before additional permit authorizations were sought. However, no new information has been provided and meetings to discuss alternatives have not occurred. Our June 6, 2005, letter to the Corps includes a summary of our previous comments and concerns to the POA, MARAD, and the Corps regarding potential project effects on anadromous fish.

Impact Assessment

The best available scientific literature indicates that juvenile and adult salmonids inhabit and move along nearshore, shallow water areas because these habitats provide food and refuge from predators. Scientific studies in the Pacific Northwest provide information which we believe is relevant to an understanding of potential project effects on anadromous fish. We provided pertinent information and references about anadromous fish use of Pacific Northwest estuarine and nearshore habitats to the Corps in an attachment to our June 6, 2005, letter on phase 1 of the project. Subsequent to that letter, KABATA and POA published reports which provide limited but important data and information about juvenile and adult anadromous fish distribution and use of Knik Arm. There is relatively little definitive information presently available about juvenile and adult anadromous fish use of specific habitats in Knik Arm, making it difficult to predict with certainty potential project impacts. Based on the best available information, the proposed project has the potential to result in significant direct impacts to anadromous fish in Knik Arm (see attached POA and KABATA Knik Arm fish reports- summary and comments). In addition, this project, in combination with other proposed and potential upper Cook Inlet projects and

[3] Previous Service correspondence on this project includes: September 10, 2004 (Comments on the draft environmental assessment); September 2004 (Comments on Port of Anchorage Fish Studies); April 19, 2005 (Comments on final environmental assessment); June 6, 2005 (Comments on the Corps public notice for phase 1 of the project); July 20, 2005 (Comments on the draft Mitigation Concept Plan); October 19, 2005 (Comments on draft EA, Cherry Hill Gravel Extraction project) and; January 26, 2006 (Request for extension to provide comments on Corps public notice).

rapid development in the Matanuska-Susitna Borough has the potential to result in significant cumulative impacts to anadromous fish habitat and populations.

We continue to believe that the most significant project-related impacts are the direct loss of intertidal habitat, particularly for juvenile anadromous fish and the potential for adverse effects on fish movement and migration of both adult and juvenile anadromous fish. Based on existing literature (references previously provided) and the most recent Knik Arm studies, shallow, littoral habitat in Knik Arm is used by juvenile salmon for feeding and refuge from strong tidal currents and predators. In addition, according to the recent studies, adult salmon use the shallow littoral zone, possibly to escape predation by beluga whales. We believe the loss of littoral habitat and effects on fish movement and migration will result in significant adverse impacts to aquatic resources of national concern.

We are also concerned about the construction related impacts of the proposed project. Numerous studies have shown that noise associated with pile driving can kill and injure fish[4]. The present alternative for port construction will require driving sheet piling across the face of the 8,880-foot-long dock expansion. The pile driving will occur over a 7 year period. Since fish were found in the project area during all ice free months, the potential for significant impacts to fish from noise is unavoidable. High turbidity and currents make the impact nearly impossible to monitor or document. Therefore, methods to avoid and minimize noise effects should be implemented during project construction.

In addition to project effects on anadromous fish, the Service is concerned about effects of material site development on migratory birds. Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to "take" migratory birds, their eggs, feathers or nests. Timing and permitting requirements under the MBTA are important elements of project planning. Some species and their nests have additional protections under other federal laws, including those listed under the Endangered Species Act (ESA), and bald and golden eagles (protected under the Bald and Golden Eagle Protection Act).

Practicable Alternatives

The Service does not have the expertise to evaluate the technical engineering or economic feasibility of practicable alternatives which would have less adverse impact on the aquatic ecosystem. However, the Service is concerned that the potential effects of the proposed project on anadromous fish populations, adult and juvenile anadromous fish movements and migrations, and loss of intertidal and subtidal habitat in Knik Arm, will be significant. We are also concerned about the adequacy of the MARAD evaluation of practicable alternatives. Full evaluation of practicable alternatives which minimize solid fill and sheet pile in favor of pile supported designs, is important because the proposed project has the potential for significant direct and indirect adverse effects on the aquatic ecosystem, including anadromous fish, one of our trust resources. Any catastrophic failure of the proposed project will result in additional direct and indirect effects on anadromous fish, both as a result of the failure itself and as a result of reconstruction.

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[4] Hastings M and A. Popper. 2005. Effects of Sound on Fish. California Department of Transportation. 82p.

Endangered Species Act Comments
Based upon the project description, the Service concurs that the proposed project is not likely to adversely affect any species under Service jurisdiction listed as threatened or endangered under the Endangered Species Act, as amended. Further consultation regarding this project is not necessary at this time. If project plans change, new information becomes available that would indicate listed or proposed species may be affected by the project, new species are listed that may be affected by the project, or listed species are observed on the project site, consultation should be reinitiated by your agency.

Conclusion and Recommendations
The proposed project does not appear to comply with Section 404(b)(1) Guidelines of the Clean Water Act in that practical alternatives to the project have not been adequately considered. Furthermore, all practicable measures to minimize impacts to the aquatic environment are not included. The proposal lacks adequate information regarding proposed methods to avoid, minimize, and replace the losses to aquatic resources, or to address the potential negative effects to fish and wildlife habitat.

In accordance with procedural requirements of the 1992, 404(q) Memorandum of Agreement between the Department of the Interior and the Department of the Army, Part IV 3(a), we are advising you that the proposed work may result in a substantial and unacceptable impact to aquatic resources of national importance, unless a less damaging alternative is proposed. We recommend the permit for the project described in the public notice not be issued at this time. If you intend not to accept this recommendation, please contact us in accordance with the Memorandum of Understanding of 1992 between our departments.

At the meeting on February 9, 2006, there was interagency agreement and understanding that an independent third party review of the project's technical and seismic design, overseen by the Corps, was warranted. There was also agreement that the independent third party review would include an evaluation of practicable alternatives which will avoid and minimize potential effects on anadromous fish. An independent review of the project design is needed to assure that a practicable alternative is selected, designed and implemented so that adverse effects on our trust resources are avoided and minimized. An independent review should be directed by the Corps.

Recommendations if there are No Practicable Alternatives
If the Corps determines that there are no practicable alternatives to the proposed project available that would avoid and minimize adverse effects on anadromous fish the Service will not object to issuance of a Department of the Army permit provided that the following recommendations are incorporated as special conditions:

1. During the period from April 15 through August 15, all pile driving associated with the project must use sound attenuation measures approved by the Corps of Engineers, in consultation with the USFWS and NMFS, to reduce noise levels below the threshold for causing injury to juvenile anadromous fish.

Rationale: This condition is intended to prevent damage to anadromous fish populations using the Port of Anchorage area. Juvenile anadromous fish are thought to be particularly susceptible to adverse effects of noise generated by impact pile driving because they are present in the Port area for much of the summer. Adult anadromous fish are thought to move through the area very rapidly. Adverse effects on fish can include death or injury. Vibratory pile driving is thought to result in relatively little injury to fish, and is one method available to reduce sound effects. Other available methods include bubble curtains or driving piling when areas are dewatered as a result of low tides. Based on limited studies conducted by the POA and KABATA, the majority of juvenile anadromous fish migrating through Knik Arm are found in the project area in mid-April, May, June, July, and early August.

2. A Department of the Army permit should be not issued for phase II of the project until: a) a complete mitigation plan is agreed upon by the Corps, MARAD, POA, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, State of Alaska, Municipality of Anchorage, and the Matanuska-Susitna Borough, and b) compensatory mitigation funding has been provided by the applicant.

Rationale: A mitigation fund is needed to provide for compensation related to unavoidable impacts to anadromous fish habitat resulting from the proposed project. It is impossible to provide on-site mitigation for adverse project impacts related to loss of anadromous fish habitat or for adverse effects on anadromous fish movements and migration due to the extensive area to be impacted and the absence of comparable on-site restoration or enhancement options. Therefore, off-site compensatory, mitigation opportunities are required. Since an unknown percentage of the anadromous fish using the project site originate in Matanuska-Susitna Borough steams and an unknown percentage originate in the Municipality of Anchorage it is appropriate to designate that a share of mitigation funds be used in each jurisdiction.

The Service believes there should be compensation for all unavoidable losses of intertidal, subtidal and wetland habitats because these habitats are aquatic resources of national importance. Additionally, there should be compensation for unavoidable project effects on movements and migration of anadromous fish. The mitigation plan should include the following provisions:

(a) Approximately fifty percent of compensatory mitigation funds will be available for mitigation projects in the Matanuska-Susitna Borough and fifty percent for projects in the Municipality of Anchorage.
(b) Language governing administration of the escrow account shall be approved by the Corps, after consultation with resource agencies.
(c) No funds should be disbursed from the compensatory mitigation fund without written authorization from the Corps, after consultation with resource agencies.
(d) The Corps, in consultation with resource agencies, shall approve mitigation projects designed and properly implemented to protect, conserve, and restore habitat for anadromous fish within the boundaries of the Matanuska-Susitna Borough, and the Municipality of Anchorage.

3. The Service recommends that to prevent impacts to nesting migratory birds, no vegetation clearing, fill placement, excavation, or other construction activities at the material sites shall be conducted between May 1 and July 15, except at sites which have been sufficiently disturbed or altered (e.g., with fill, plastic, or other materials that will cover nesting habitat) before May 1 to eliminate suitable nesting habitat.

Rationale: Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to "take" migratory birds, their eggs, feathers or nests, as previously discussed.

Thank you for the opportunity to provide comments and recommendations. If you have any questions regarding these recommendations, please contact project biologist Phil Brna at 271-2440, or by email at phil_brna@fws.gov.

Sincerely,

Ann G. Rappoport
Field Supervisor

Attachment (1)

cc: K. Bruce, POA
S. Seaberg, ADNR
M. LaCroix, ADF&G
H. Dean, EPA
L. Peltz, NMFS
M. Langdon, ADEC
M. Fink, ADF&G
T. Tobish, MOA
M. O'Brien, MSB
D. Wigglesworth, MOA
M. Carter, MARAD

ATTACHMENT

Port of Anchorage and KABATA Knik Arm Fish Reports- Summary and Comments

The KABATA[1] and POA[2] fish reports, which are essentially identical, provide the most current information about anadromous fish habitat and use in Knik Arm in the vicinity of the proposed project. Pertinent conclusions from the reports, along with our interpretation and analysis, follows:

1. While threespine stickleback was the most abundant fish species observed throughout Knik Arm, the results from the Port study show that juvenile coho, chinook, and chum salmon were the most abundant fish species present in the intertidal area of Knik Arm, including the project site.
2. Juvenile salmon were a dominant group of species present throughout Knik Arm (as documented in these reports as well as in Moulton[3]). Abundance of juvenile salmon in Knik Arm was highest during the months of April, May, June, July, and August. It appears that juvenile salmon present after July were mostly young of the year coho and sockeye salmon, which may have a poor survival rate.
3. Juvenile coho, sockeye, and chinook salmon stay in Knik Arm for several months, where they feed and grow. It appears that juvenile chum and pink salmon move out of Knik Arm relatively rapidly.
4. A comparison of the POA tow netting and beach seining data and the KABATA beach seining data suggests an intertidal or shoreline preference for juvenile chinook and coho salmon. Juvenile chum and sockeye salmon appear to use both intertidal and off-shore habitats in Knik Arm, while juvenile pink salmon are primarily found in off-shore habitat.
5. The majority (80 to 85%) of juvenile chinook salmon found in the Port area and along the east side of Knik Arm are of Ship Creek hatchery origin, based on otolith analysis. This suggests chinook salmon utilize the intertidal area as they make the transition from freshwater to saltwater. This also suggests that given the relatively high contribution of juvenile chinook salmon from the Ship Creek hatchery to Knik Arm versus the relatively low contribution of wild chinook from all other Knik Arm tributaries, the Port and east side Knik Arm intertidal area provide important habitat for wild fish found in the intertidal area (15 to 20%). Loss of almost 9,000 feet of intertidal habitat in the Port area will result in an irreplaceable and irretrievable but unquantifiable loss of salmon, a degradation of the sport, commercial, and personal use fisheries, loss of economic opportunity, and a loss of ecological values. The cumulative effects of the proposed project when combined with other potential development in the Knik Arm watershed could be significant.
6. Juvenile salmonids feed on invertebrates in the small lenses of clear water resulting from short periods of relative quiescence in Knik Arm. Terrestrial insects contribute a large portion of the diet of juvenile salmonids.
7. Adult salmon exhibited an "extreme orientation to shallow nearshore areas (where they may gain some refuge from beluga whale predation) (Houghton et al. 2005)."
8. "The traditionally described functions of littoral habitats for nurturing juvenile salmonids (shallow water refuge from predators; structure which provides refuge from predators;

abundant prey; and reduced salinity) are not provided by Knik Arm shorelines, nor do they

9. appear to be essential for successful juvenile salmonid rearing or migration." "Thus, at the very least, juvenile salmonids in Knik Arm are not as dependant on littoral habitats for the

same reasons, nor to the same degree as they are in clear water areas of Southcental Alaska. Also, it seems quite likely that juvenile salmonids in Knik Arm are not as dependant on littoral habitats as are the same species elsewhere." (Houghton et al. 2005) We disagree with these conclusions. We analyzed catch per unit effort (CPUE) data from the POA and KABATA fish reports. CPUE data accounts for bias in relative effort of shoreline sampling versus off-shore sampling and for sampling efficiencies associated with various gear types. Our analysis of CPUE data (Table 1), clearly shows:

- a preference for juvenile chinook and coho salmon to use littoral habitat;
- both littoral and off-shore habitat is important for juvenile sockeye and chum salmon; and
- juvenile pink salmon preferentially use off-shore habitat.

Table 1: CPUE Data Comparison, Juvenile Salmon, Beach Seines versus Tow Nets, 2004-2005, POA and KABATA Fish Reports

	Littoral / Nearshore Habitat		**Off-shore Habitat**	
CPUE	**POA 2004/2005 Beach Seines**	**KABATA 2005 120-foot Beach Seines**	**POA 2005 Tow Net Transects**	**KABATA 2005 Tow Net Transects**
Juvenile Chinook	0.84	1.3	0	0.2
Juvenile Chum	0.33	1.0	0	2.5
Juvenile Coho	1.86	1.6	0.1	0.3
Juvenile Pink	0.06	0.2	0	1.3
Juvenile Sockeye	0.42	1.1	0	2.4

[1] Houghton, J., J. Starkes, M. Chambers, and D. Ormerod. November 2005. 2004-2005 Marine Fish and Benthos Studies in Knik Arm, Anchorage, Alaska. Pentec Environmental prepared for Knik Arm Bridge and Toll Authority and HDR Alaska, Inc..

[2] Houghton, J., J. Starkes, M. Chambers, and D. Ormerod. November 2005. 2004-2005 Marine Fish and Benthos Studies- Port of Anchorage, Anchorage, Alaska. Pentec Environmental prepared for Integrated Concepts and Research Corporation.

[3] Moulton, L.L. 1996. Early Marine Residence, Growth, and Feeding by Juvenile Salmon in Northern Cook Inlet, Alaska. Alaska Fishery Research Bulletin 4: 154-177.

UNITED STATES ENVIROMENTAL PROTECTION AGENCY
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ALASKA OPERATIONS OFFICE
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22 March 2006

Mr. Ryan H. Winn, Project Manager (CO-R-S)
South Section, Regulatory Branch
Alaska District, U.S. Army Corps of Engineers
P.O. Box 6898
Elmendorf AFB, Alaska 99506-6898

RE: Public Notice POA-2003-502-N

Dear Mr. Winn:

This letter responds to the 19 January 2006 Public Notice (PN) of a proposal by the Port of Anchorage (Port) to expand, reorganize and improve its facilities, on the Knik Arm of Cook Inlet, just north of the mouth of Ship Creek. The project would include placement of dredged and/or fill material in dredging of 235 acres of inter- and subtidal waters, installation of a sheetpile bulkhead, 108 acres of inter- and subtidal waters (in addition to the 27 acres already permitted for Phase I of the project) at the Port site. It would also involve clearing and other work in a total of 34.5 acres of freshwater wetlands and other waters at two fill material extraction sites on Elmendorf Air Force Base.

EPA recognizes the Port's need to increase efficiency and security, and to replace dated structures and other facilities. We also acknowledge the Port's need to expand its capacity to meet the needs of a growing Alaska population and, potentially, the U.S. military. However, it appears that the work proposed—in conjunction with that already permitted, including the 27 acres of fill authorized in 2005—is not the least damaging, practicable alternative to fulfill the project purposes. As such, the proposal would not comply with the Clean Water Act's (CWA's) Section 404(b)(1) Guidelines, and EPA recommends that you not approve it.

I. Project Area Functions/Values and Potential Adverse Impacts.

Section 230.11 of the CWA's 404(b)(1) Guidelines requires—prior to permitting—a determination of "the *potential* short-term or long-term effects" on "the physical, chemical, and biological components of the aquatic environment (emphasis added)." Below, are descriptions of various components of the aquatic environment in the Port area, as well as the short- and long-term impacts EPA believes the proposed project would have on them. The U.S. Maritime Administration (MarAd) has completed final or draft Environmental Assessments (EAs) for the proposed Port expansion and the two proposed material extraction sites. Our discussion below focuses on the issues which EPA believes those EAs address inadequately.

A. Fish

As reported in greater detail by the U.S. Fish and Wildlife and National Marine Fisheries Services (NMFS), the Knik Arm of Cook Inlet supports a wide variety of fish species. That Alaska Department of Fish and Game has catalogued populations of anadromous fish (i.e., chinook, coho, chum, pink and sockeye salmon, as well as Dolly Varden) in at least fifteen of the streams that empty into Knik Arm. Popular recreational salmon fisheries exist on many of these streams, including Ship Creek. Located immediately south of the developed Port area, and approximately 1,900 feet south of the proposed expansion, Ship Creek supports wild and hatchery-produced chinook, coho, chum, and pink salmon. Its downtown Anchorage location, coupled with the strength of its hatchery

EXHIBIT K

salmon runs, have made Ship Creek one of the most popular sportfisheries in Alaska, and one of the most popular urban salmon fisheries in the country. Being located in the oldest part of Anchorage, Ship Creek has experienced substantial direct and indirect alterations of its channel, riparian zone and estuary, as well as extensive development in other portions of its lower watershed. These modifications have reduced the stream's wild salmon populations considerably, thus increasing the importance of hatchery production to the Ship Creek sportfishery. A number of recently completed stream restoration and enhancement projects—supported, in part, by millions of dollars in Federal funding—are beginning to reverse the damage caused by previous developments and uncontrolled human use. Additional restoration and enhancement projects are currently in the planning stages, and similar efforts are beginning on several streams in the Matanuska-Susitna Borough.

Although not well-studied, the proposed Port expansion area appears to support all five species of Pacific salmon, as well as a number of species of smaller fish which provide food for salmonids, seabirds, and other marine organisms, as well as humans. Fish sampling conducted in 2004 and 2005, in association with the proposed Port expansion and Knik Arm bridge, indicated that chinook and coho smolt demonstrate a strong preference for intertidal habitat in Knik Arm. Such a finding is consistent with studies conducted elsewhere in the Pacific Northwest, and supports the resource agencies' belief that intertidal areas at and near the Port provide important refuge from predators and strong tidal currents, and thus, a relatively safe area in which to feed during the several months they spend adjusting to saltwater. The Port area appears to be particularly important for salmon smolt from Ship Creek, which are likely carried in that direction when they emerge from the stream during incoming tides.

Adult salmon also appeared to show a strong preference for shallow nearshore areas during the 2004/2005 sampling. Such an affinity may arise from their seeking refuge from predation by beluga whales.

The proposed project has the potential to adversely affect all of these species. Together, these impacts have the potential to reduce salmonids populations in Ship Creek and other streams that empty into Knik Arm. Specifically, pursuant to section 230.11, potential adverse impacts of the proposed project on fish include the following:

1. Individually and cumulatively substantial permanent loss of intertidal salmonids rearing habitat (e.g., feeding, predator/current refuge, osmoregulation) (Sections 230.11(e) and (g)). Historical waterfront development has eliminated in excess of 50 acres of intertidal area between Ship Creek and Cairn Point. It appears that approximately 80 acres of such habitat still remain. Although neither the narrative nor the plans of the PN differentiate the extent of proposed intertidal fill, it appears from the permitted plans for Phase I that the overall Port expansion would eliminate over eighty percent of the remaining intertidal area. Approximately 60 acres of the loss would appear attributable to the proposed fill, with an additional 6.5 acres resulting from the operational dredging. The resulting cumulative loss would be nearly ninety percent of the 1950s-era intertidal habitat.

   The approximately 15 acres of intertidal area that would remain south of Cairn Point following Port expansion would be split roughly in half, to the north and south of the expanded Port. The vast majority of the remaining acreage on the south side has been permitted for fill in the past (i.e., Cook Inlet 326 (Y-850014) and Ship Creek 7 (AA-840184)). Even if those permits are not renewed, salmonid rearing habitat north of Ship Creek would be severely reduced as a result of the proposed Port expansion.

2. Individually and cumulatively substantial interruption of salmonid movement north of Ship Creek (Sections 230.11(a), (b), (e), and (g), 230.20, 230.23, 230.31 and 230.51). If no other work besides the Port expansion occurred, there would remain approximately 1,900 linear feet of altered intertidal area immediately north of Ship Creek. Fill

in that area currently extends seaward to the +20- to +16-foot, MLLW line, with approximately 850 linear feet of steep riprapped shoreline and 1,050 linear feet of sheetpile bulkhead. In addition, maintenance dredging to +8 to +4 feet, MLLW, has been authorized (i.e., Cook Inlet 326, Ship Creek 7, and Knik Arm 133 (2001-0485)) in up to 2.2 acre (800 linear feet) of the remaining intertidal area.

In the Port expansion area, the southern two-thirds (i.e., one mile) of the shoreline currently consists mostly of riprapped fill extending seaward to the +20- to +16-foot, MLLW line. There are three pockets, ranging from 700 to 1,000 linear feet in length, where the mudflats extend above +20 feet, MLLW. The remaining shoreline, north of the existing Port facilities, is still largely in natural condition, with an old, 600-linear-foot fill with vegetated margins abutting the Port and a few scattered, smaller disturbances farther northward. In this area, the mudflats extend up to approximately +32 feet, MLLW

Phase I and the proposed expansion would convert 1.7 mile of existing shoreline to vertical, sheetpile bulkhead. It would extend the existing shoreline 600 to 800 feet seaward, into deep water (i.e., -47 feet, MLLW). Operational dredging would convert an additional 650 linear feet of intertidal shoreline to deep water. Altogether, the project would eliminate the remaining intertidal mudflats in that entire reach, and provide no refuge from predators or tidal currents for the adult salmonids and chinook and coho smolt that showed a strong preference for that area. Should the Cook Inlet 326 and Ship Creek 7 expansions be reauthorized, all but 300 linear feet of the first two miles of intertidal shoreline north of Ship Creek would be eliminated. In either case, the result would be a substantial increase in the exposure of adult and juvenile salmonids to predators and/or tidal currents, and a potential decrease in salmonid populations.

3. Loss of individuals and/or loss of habitat as a result of increased noise (Sections 230.11(g) and (h)). Project construction would include installation of sheet pile bulkhead along the seaward face of the fill. It is EPA's understanding that juvenile salmonids are particularly sensitive to the underwater noise associated with such an activity, and that impacts can include death, injury and/or avoidance of otherwise suitable habitat. Given the direct and other indirect losses of habitat that would result from the proposed project, impacts associated with underwater noise during construction could be cumulatively substantial.

4. Exposure to contaminants (Sections 230.11(a), (d), (g) and (h), 230.20, 230.22, 230.31, 230.32, 230.51, and 230.61). The PN states that, based on recent evaluations, there is no reason to suspect hazardous substance contamination in the area to be dredged. Actually, sampling conducted recently by EPA, at an Alaska Railroad-installed monitoring well west of the fuel storage tanks between Ocean Dock Road and the Port access road, indicate that shallow groundwater in that area is contaminated with petroleum products, benzene, and ethylene dibromide (EDB). Given the proximity of the site to the Port's proposed dredging area (i.e., approximately 600 linear feet), EPA believes, pursuant to section 230.61(b), that material in the proposed dredging area could also be a carrier of these contaminants. Spills and other discharges inherent to Port operations could also have contributed to contamination of the material. In either case, dredging and open water disposal could introduce contaminants into the water column. Depending on the exact nature and extent of contamination, if any, dredging and open water disposal could negatively impact adult and/or juvenile salmonids and/or other fish in Knik Arm, either directly or as a result of adverse effects on organisms in their food chain.

   The PN indicates that, if testing reveals "significant" contamination in the dredged material, that material would not be discharged into the Corps' open water disposal area. Instead, material with "significant" contamination would be stored temporarily on a ten-acre portion of the "south backlands" area. Following dewatering, the material would be contained within the permanent fill for the Port expansion, in the portion located landward of the current pile-supported dock face. The PN alludes to use of onsite containment and other Best Management Practices (BMPs) to prevent contaminants from leaving the temporary storage area, and notes that, in the permanent fill area, the material would be capped with a combination of common and engineered fill to prevent leaching of contaminants.

It is not possible to assess the potential contaminant-related impacts of dredging and material disposal until the nature and degree of contamination, if any, is known. Short-term impacts are also difficult to assess given that the PN is unclear about the timing of the temporary stockpiling and permanent disposal activities in relation to other elements of the project. For example, from Figures 2 and 5, it appears that the proposed temporary stockpile location coincides with areas proposed for construction in both 2006 and 2008, while the proposed permanent disposal area would be within the footprint of fill slated for 2008. In the meantime, it would appear that construction dredging would begin by 2007, if not earlier. As such, it is not possible to discern whether the contaminated material, if any, would be placed directly onto intertidal mudflats, or onto previously placed fill.

Regardless, the details about BMPs for handling, temporary storage and permanent disposal will need to be finalized once the nature and extent of contamination, if any, is determined. Without appropriate testing and effective implementation of proper BMPs, both the temporary stockpiling operation and the permanent disposal could reintroduce contaminated water and/or sediment into Knik Arm, with potential adverse impacts to fish and/or food chain organisms, as described above. Reintroduction of contaminants could also occur as a result of seismic activity either during construction/phasing or after completion. Contamination of fish and/or their prey could also result from improperly managed stormwater and/or inadequate spill controls utilized following construction.

B. Beluga Whales

Based on consultation with NMFS, it is EPA's understanding that the very small and declining Cook Inlet beluga whale population use the waters of Knik Arm extensively. Visual observations and satellite tracking efforts in 2005 indicated substantial use of the waters within the proposed project footprint for feeding, travel to and from upper Knik Arm, and other activities. As NMFS will explain in greater detail, it appears, at the same time, that the beluga whale habitat in the Port area is actually of higher value than the documented level of use might signify, indicating that Port-related operations may deter some use of the area.

The proposed project has the potential to adversely affect the highly vulnerable Cook Inlet beluga whale population. Such impacts are of even greater concern in light of the cumulative effects associated with expanding operations at Port MacKenzie, on the west side of Knik Arm, and the proposal to construct a bridge across lower Knik Arm, immediately north of the Port. Pursuant to section 230.11, potential adverse impacts of the proposed project on beluga whales include the following:

1. <u>Permanent direct loss of high-value feeding habitat and indirect loss of preferred food sources (Sections 230.11(e) and (g) and 230.32)</u>. A high percentage of beluga whales observed during the 2005 monitoring efforts were feeding in the inter- and subtidal waters within the footprint of the proposed Port expansion. The overall project would directly eliminate 135 acres of this high-value habitat. In addition, as discussed in Section A, above, the project has the potential to substantially reduce Knik Arm populations of salmonids and other fish on which belugas feed. Given the tenuous status of the Cook Inlet beluga population, such an impact could be cumulatively substantial.

2. Individually and cumulatively substantial indirect loss of feeding habitat and/or preferred migration corridors (Sections 230.11(e), (g) and (h), 230.23 and 230.32). It is EPA's understanding that, as with other whales, belugas rely considerably on sound, both to navigate their environment and communicate with each other. As described by NMFS, they also appear to be particularly sensitive to noise disturbance, which may lead them to use otherwise high value habitat less than would be expected. One of the primary purposes of the proposed project is to expand Port operations. In fact, projected growth envisions a fifty percent increase in ship traffic and associated activities at the Port during the life of the project, along with a considerable increase in the size of the ships, both adding to the level of noise already occurring at the Port and apparently already deterring some beluga use. Long-term, these increases in noise could further discourage beluga use of the remaining feeding habitat in the area, and potentially interfere with beluga movements up and down Knik Arm. The Port is located immediately south of where Knik Arm narrows to only a 1.5-mile width between at Cairn Point. Coupled with other activities in the immediate vicinity, including expanding operations at Port MacKenzie, opposite Cairn Point, and the proposed Knik Arm bridge, which would cross just north of Cairn Point, long-term noise impacts associated with the project could significantly alter or limit future movement of belugas through the narrows.

   The project could also cause indirect losses of habitat and travel corridors as a result of increase noise levels during construction. Of particular concern would be underwater noise associated with installation of the sheet pile walls.

3. Exposure to contaminants (Sections 230.11(a), (d), (g) and (h), 230.20, 230.22, 230.31, 230.32, 230.51, and 230.61). As described in Section A.4., above, there is currently insufficient information to determine the nature and extent of contamination, if any, in the proposed dredging area. Contamination of belugas and/or their prey could also result from improperly managed stormwater and/or inadequate spill controls utilized following construction. Dredging, dewatering, and disposal of contaminated material could adversely affect belugas, either directly or as a result of impacts to prey species. Although it may be possible to satisfactorily minimize such impacts through proper handling and the use of BMPs, it is not possible to assess the need for such measures, or the adequacy of the proposal, until the nature and degree of contamination, if any, is known.

C. Birds

Bird habitat within the proposed project area includes the waters of Knik Arm, the intertidal mudflats and shoreline of Knik Arm, the freshwater wetlands at the two proposed material extraction sites, and the uplands adjacent to these waters. During the 2004 scoping process for the proposed project, EPA and other agencies repeatedly advised the Port and MarAd that existing information was incomplete, and recommended that they include surveys of the bird use potentially affected areas among their other planned field assessments. MarAd and the Port did not follow these recommendations and, instead, chose to rely on Anchorage area checklists, as well as reports and old field surveys that focused primarily on other areas or only a portion of the project area. As a result, the EAs completed by MarAd is entirely uninformed and inadequate with respect to the project's potential impacts on birds. For example, the March 2005 EA for the Port expansion lists Northwestern crow and European starling among the "common" species found in the terrestrial environments of the Port. Actually, according to the Anchorage Audubon Society's "Birds of Anchorage" checklist (which MarAd also referenced), the starling is considered casual to rare in Anchorage, meaning that it usually occurs irregularly and in very small numbers. The Northwestern crow, meanwhile, is accidental to casual in occurrence, because Anchorage is beyond to well beyond the species' normal range, and there are few recorded sightings. The Port expansion EA also lists Say's phoebe and red-winged blackbird as species "expected" to occur in the Ship Creek riparian corridor south of the Port, when, in fact, the Audubon Society lists the phoebe as casual, and the blackbird as rare. Furthermore, when the blackbird is encountered in Anchorage, it nearly always occurs in reedy wetlands such as Potter Marsh, rather than in the developed mudflat- and shrub/forest-dominated riparian zone of Ship Creek.

As with its treatment of bird use of Ship Creek—which the project would impact only if it alters current patterns and water circulation sufficiently to change the extent or character of mudflats there—the Port expansion EA addresses the project area's marine waters only insofar as species to be "expected." The lists are substantially incomplete and give no indication as to the extent or nature of use, or the population status of referenced species. At least one of the species mentioned—common loon—is experiencing population decline both worldwide and in Anchorage, likely due, in part, to its sensitivity to human disturbance.

With regard to intertidal areas, the EA correctly notes that Upper Cook Inlet is a major migratory corridor for shorebirds, and that the intertidal mudflats and wetlands at and south of Ship Creek are known to support considerable use by shorebirds and waterfowl. It does not acknowledge that higher intertidal areas, which serve as roosting habitat for migrating waterbirds, are limited in Upper Cook Inlet, nor, that several of the species documented as using the same type of habitat at or near Ship Creek (e.g., Hudsonian godwit, greater and lesser yellowlegs, and solitary sandpiper) are already experiencing declines in local population levels. Furthermore, having conducted no surveys of the Port area, however, MarAd relied entirely on a modest one-season survey conducted by the U.S. Fish and Wildlife Service (FWS) almost fifteen years ago. It should also be noted that the FWS survey did not encompass the spring migration period, nor most of the autumn one. As such, the EA's assertions that the Port area provides low value waterbird habitat are virtually unfounded.

Although there have been no surveys performed at the proposed extraction sites, either, there is slightly more data available regarding them, with both EAs actually listing bird species observed in or near portions of them. Besides the lists, however, there is little data regarding the actual nature and extent of bird use, particularly at the North End extract site, and little assessment of the relative habitat value of various areas. There is also no differentiation in the relative air strike risk posed by various species (e.g., large-bodied, flocking birds versus smaller birds or larger, more solitary species), and little assessment of the individual or cumulative impacts of eliminating the habitats. Of particular concern are the wetlands in the northwest corner of the North End site (referred to as Area I in the EAs Appendix B), which are over one mile from the north-south runway. Those wetlands are part of the virtually intact, contiguous complex surround Fish and Triangle lakes that are, by far, the largest system that the proposed extraction would directly impact. The complex appears to provide high value, relatively undisturbed waterbird habitat, as well as both active and passive human recreation. The EAs each include a list of Alaska Species of Special Concern (SOSC), with indications as to the likelihood of their occurrence within the extraction sites. With no other survey or observational data available, however, the table and EA may underestimate the impact of the proposed gravel extraction operations on such species. The Triangle/Fish Lake wetland complex, for instance, would appear to be prime nesting habitat for the SOSC list's rusty blackbird, which the tables merely lists as "rare." The same is true for common loon, as well as greater and lesser yellowlegs, which although not SOSC, are declining both nationally and/or in Anchorage.

For the reasons discussed above, and pursuant to Guidelines' section 230.12(a)(iv), EPA believes that, at present, there is not sufficient information with which to assess the proposed project's impacts on birds or to determine its compliance with the Guidelines with regard to that issue. Based on our own limited knowledge of bird use in the vicinity of the Port facility and the material extraction sites, potential adverse impacts include the following:

1. <u>Cumulatively substantial loss of nesting, rearing, feeding and roosting habitat for migratory waterbirds (Sections 230.11(e), (g) and (h), 230.32, 230.41 and 230.42)</u>. As discussed in Section A, above, it appears that the overall Port expansion would permanently eliminate more than 65 acres of intertidal mudflats between Ship Creek and Cairn Point, bringing cumulative losses of such habitat in that area to approximately ninety percent. The proposed Knik Arm crossing project would eliminate more than 30 additional acres of intertidal habitat immediately north of the Port. Increased noise levels associated with these pro-

jects, both during and after construction, could render additional remaining habitats unusable for more sensitive species, such as some of those that are already declining. The current use of the Port-area intertidal habitat by waterbirds breeding in or migrating through the area is unknown, but given the declines in some of their populations, the proposed project has the potential for substantial cumulative impact.

Freshwater habitat losses would also be both direct and indirect. While less individually severe than for mudflats, but would contribute to a cumulatively significant loss of such habitat in the Anchorage Bowl. Assessment of the nature and extent of the impacts is hampered by a lack of data on existing uses.

2. Exposure to contaminants (Sections 230.11(a), (g) and (h), 230.20, 230.22, 230.32, and 230.61). As described in Section A.4., above, there is currently insufficient information to determine the nature and extent of contamination, if any, in the proposed dredging area. Dredging, dewatering, and disposal of contaminated material could adversely affect birds, either directly or as a result of impacts to prey species, as could improperly managed stormwater and/or inadequate spill controls utilized following construction. Although it may be possible to satisfactorily minimize such impacts through proper handling and the use of BMPs, it is not possible to assess the need for such measures, or the adequacy of the proposal, until the nature and degree of contamination, if any, is known.

D. Human Use

As noted in Section A, above, several of the fish species that currently utilize the area of the proposed Port expansion are of importance to humans, either as the targets of commercial, recreational or subsistence fisheries, or as forage for those species. The hatchery-supported Ship Creek fishery, in particular, is exceedingly popular with both residents and tourists. A 2004 Northern Economics estimate placed the fishery's contribution to the local economy in the millions of dollars.

Beluga whales and birds that do or may use the areas affected by the proposed project also provide for both active and passive human use, through hunting and wildlife viewing. Anchorage is the most accessible destination in the United States for viewing of many of these species. The mudflats and nearshore waters at and south of Ship Creek, for instance, are popular destinations for both birdwatching tour companies and local enthusiasts. In part because if its visibility, Ship Creek and its estuary are also the focus of a Municipal and community enhancement and restoration effort, facilitated in part by Federal funding, and supported by a multi-representational task force that reports to the Mayor's office.

The proposed project has the potential to adversely affect all of these uses. Specifically, pursuant to section 230.11, potential adverse impacts of the proposed project on human uses of the area include the following:

1. Individually and cumulatively substantial degradation of recreational and personal use fisheries (Sections 230.11(e), (g) and (h), 230.51, and 230.52). As discussed in Section A, above, the project will substantially diminish and alter the salmonid rearing habitat and migration corridors between Ship Creek and Cairn Point. Such impacts could, in turn, weaken the popular fisheries associated with salmonid runs in Ship Creek and other streams that empty into Knik Arm.

2. Cumulatively substantial degradation of wildlife viewing opportunities (Sections 230.11(g) and (h), and 230.52). As discussed in Sections B and C, above, the proposed project could contribute to locally significant declines in the populations of beluga whales and waterbirds that utilize the mudflats and nearshore waters at and south of Ship Creek. Such impacts would diminish wildlife viewing opportunities that are unique to this area.

II. Recommendations.

A. Avoidance and Minimization

The CWA Section 404(b)(1) Guidelines require impact avoidance and minimization in several areas. For example:

- Section 230.1(c) states that dredged or fill material "should not be discharged into the aquatic ecosystem, unless it can be *demonstrated* that such a discharge *will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities* affecting the ecosystems of concern" (emphasis added);

- Sections 230.10(a) and 230.12(a)(1)(i) prohibit permitting a discharge when there is a less damaging practicable alternative to the proposal;

- Section 230.10(a)(3) establishes that presumptions that alternatives not involving special aquatic sites—such as wetlands and mudflats—are both less damaging and practicable, unless "clearly demonstrated otherwise;"

- Sections 230.10(d) and 230.12(a)(1)(iii) prohibit permitting a discharge unless the project incorporates "*all* appropriate and practicable measures to minimize *potential* harm to the aquatic ecosystem" (emphasis added); and,

- Section 230.12(a)(1) requires a finding of non-compliance with the Guidelines if the project will cause significant degradation of the aquatic ecosystem.

The Guidelines also specifically address variability in the extent of analysis necessary to determine compliance with these requirements, noting, for instance:

- In section 230.6(a) and (b), that it is essential to demonstrate knowledge of proposed fill and dredging/extraction sites, with the level of documentation reflecting the "significance and complexity" of the proposed activity. Subsection (a) also advises that "extensive testing, evaluation [and] analysis" is not necessary for minor, routine activities with little, if any,potential to cause significant degradation of the aquatic environment;

- In Section 230.10, that evaluation procedures must vary to "reflect the seriousness of the *potential* for adverse impacts" (emphasis added); and,

- In Section 230.12(a)(iv), that a project fails to comply with the Guidelines when there is not "*sufficient information* to make a reasonable judgment" regarding compliance (emphasis added).

The discussion in section I, above, addresses many of the potential impacts of the proposed project. In light of that discussion and the 404(b)(1) Guidelines outlined above, it appears that there may be less damaging alternatives to fulfill the Port's purposes of upgrading its existing facilities, expanding operations to meet growing needs, and improving facility security. Based on the seriousness of the potential impacts associated with the proposed project, EPA recommends:

1. That the Corps further analyze the practicability of less damaging alternative waterfront development configurations. In particular, EPA recommends further analysis of both smaller and partially pile-supported designs that would allow preservation or reestablishment of some intertidal habitat. With regard to size, the PN and EA establish a need for an additional 80 acres of land to accommodate a 1.5 to 2.5% growth in cargo operations over the next twenty years. They provide little to no detail, however, clearly demonstrating that there is no less damaging alternative to the additional 55 acres of proposed fill for support,

administrative and other facilities. Pursuant to section 230.10, the seriousness of the potential impacts and the expansiveness of the overall project purpose would appear to warrant a more rigorous assessment of cost, technical and logistic considerations than is represented in the MarAd EA. We recommend that the analysis also address the likelihood of structural failure leading to reintroduction of contaminated dredged materials, should any be encountered;

2. That the Corps further analyze whether there is a less damaging practicable alternative to the proposed timeframe and project sequencing. As noted above, the Port and MarAd estimate that the proposed project would provide for approximately twenty years of growth in Port operations. The proposal, however, involves expansion to that footprint over no more than six years' time. Uncertainties in the PN plans and project description (as discussed in Section I.A.4., above) raise the possibility that much of the proposed project footprint could be adversely impacted within an even shorter period. At the same time, there remains insufficient information to make the Guidelines-required determination regarding the nature and extent of adverse impacts to the aquatic ecosystem. Thus, EPA recommends a closer examination of the practicability of less damaging project timeframes and sequencing;

3. That the Corps require avoidance and buffering of the Triangle/Fish Lakes wetland complex in the North End extraction site. As discussed above, this complex appears to be the most valuable of the waters that the proposed extraction areas would directly impact. It is also the most distant from the runways, and not of particular appeal to large-bodied, flocking birds that pose the greatest hazard of air strikes, but more likely to provide habitat for smaller, wetland-dependent birds whose populations are currently declining. Finally, given the uncertainty as to the ultimate material needs, and the extended project timeframe even if the entire fill amount is necessary, the Port does not appear to have provided the required clear demonstration that avoiding this wetland and at least a 300-foot buffer would be impracticable;

4. That the Corps require sampling and analysis of material in the proposed dredging areas prior to issuing any permit for dredging. Pursuant to our respective authorities and expertise, EPA and the Corps have been communicating regarding the potential for contamination in the proposed dredging areas. As indicated in e-mails dated 8 and 16 March 2006, EPA generally concurs with the proposed preliminary draft sampling plan, including use of a Rapid Optical Screening Tool (ROST) to screen for Polynuclear Aromatic Hydrocarbons (PAHs); lab analysis of sediment and water samples to screen for PAHs and Volatile Organic Compounds; and, additional testing based on the results of the two initial screening methods.

   We would like to review a draft of the final sampling plan, and recommend also that:

   a. The plan a figure specifying planned sampling locations and depths, as well as GPS surveying of the sample locations, and Quality Assurance/Quality Control measures for the ROST and analytical lab;

   b. The lab analysis be used to verify both negative and positive ROST results, not just negative results; and,

   c. That the lab analysis also include other potential contaminants of concern, such as Persistent Organic Pollutants and heavy metals.

   Finally, since specific recommendations regarding material handling, dewatering and disposal sites/methods, as well as BMPs necessary to minimize the impacts of any contamination are dependent upon the results of the sampling, EPA recommends that you not issue any permit for dredging until we have had the opportunity to review those results;

5. <u>That any permit involving pile driving require state-of-the-art measures to minimize noise impacts to fish and beluga whales</u>. EPA anticipates incorporation of measures such as seasonal and tide stage timing windows, equipment limitations (e.g., use of vibratory versus impact piledrivers) and other techniques to reduce construction-related losses of fish and belugas, but defers to FWS and NMFS for specific details. Likewise, we advocate that any permit incorporate specific NMFS recommendations to monitor and minimize potential impacts to belugas from increases in operational noise levels;

6. <u>That any permit authorizing fill in intertidal and marine waters include seasonal and/or tide stage timing limitations to minimize impacts to aquatic organisms and waterbirds</u>. It is not possible at this time to recommend a specific timing window(s) to minimize impacts to waterbirds, given the lack of data on current use of the area, as discussed in Section I.C., above. For aquatic organisms, limiting fill placement to low tide and in the winter months would have the least impact; and,

7. <u>That any permit authorizing work at the extraction sites incorporate a seasonal timing window to minimize impacts to migratory birds</u>. Specifically, we recommend that any permit prohibit clearing, grubbing, excavation, stockpiling, grading and/or filling at the extraction sites prohibit between 1 May and 15 July.

In addition, EPA notes that the Port is required to comply with the requirements of Section 402 of the CWA, in regard to any discharges of stormwater or other effluents from the facility or the extraction sites into waters of the U.S. We anticipate that the Port will continue to work with us to ensure that proper authorization is in place and appropriate measures to avoid and minimize adverse impacts are implemented.

The outcome of the additional analyses requested in items 1, 2 and 4, above, may alter our other recommendations or necessitate additional ones. At such time as we have the opportunity to review additional information, we will make such recommendations in as timely a manner as possible.

<u>B. Compensatory Mitigation for Unavoidable Adverse Impacts</u>

As discussed above, there currently is neither a clear demonstration regarding the least damaging practicable alternative for to accomplish the Port's purposes, nor sufficient information to fully identify the potential adverse impacts thereof. As such, it is not possible to make a complete recommendation regarding measures to offset unavoidable adverse impacts of the Port expansion. EPA supports the efforts your office has initiated to establish an interagency advisory committee to make compensatory mitigation recommendations, and in general, supports the concept of establishing an in-lieu fee account to fund compensatory mitigation projects. We recommend, however, that:

1. The role of the advisory committee be formalized in the same Memorandum of Understanding (MOU) that the PN indicates the Corps and the Port would finalize prior to permit issuance, and, that the advisory committee members have the opportunity to be MOU signatories, as well;

2. That the MOU specify the method(s) by which the in-lieu fee amount will be determined, including, primarily the Anchorage Debit-Credit Methodology;

3. That the MOU specify that the expenditure of the in-lieu fee funds would be limited to projects that would offset adverse project impacts by restoring, enhancing and/or preserving salmonid, beluga, water/wetland bird habitat in relative proportion to the debits associated with those impacts. We continue to believe that restoration of the estuary at the mouth of Ship Creek would provide the most appropriate offset of the unavoidable impacts of Port expansion, and recommend that such a project be investigated further by the advisory committee; and,

4. That your office not issue any permit until the MOU has been signed by all participating agencies and the in-lieu fee funds have been provided by the Port.

EPA appreciates the opportunity to provide input on this proposal. Once you have had the opportunity to review our comments and recommendations, please contact me to discuss how they will be addressed.

Sincerely,

Heather Dean
Environmental Scientist

cc: ADEC/Anchorage
ADFG/Anchorage
ADNR-OPMP/Anchorage
ADNR-OHMP/Anchorage
Municipality of Anchorage, Planning
FWS/Anchorage
NMFS/Anchorage

COOK • INLET • KEEPER

Protecting Alaska's Cook Inlet watershed and the life it sustains

VIA EMAIL ONLY

March 22, 2006

Colonel Timothy J. Gallagher
Alaska District Commander & District Engineer
U.S. Army Corps of Engineers
Post Office Box 6898
Elmendorf Air Force Base, AK 99506-0898

Michael C. Carter, Director
Office of Environmental Activities
U.S. Maritime Administration
400 Seventh Street, SW.
Washington, D.C. 20590

RE: COMMENTS ON PROPOSED CLEAN WATER ACT SECTION 404 PERMIT FOR PORT OF ANCHORAGE INTERMODAL EXPANSION PROJECT PHASE 2 (POA-2003-502-N) & COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE NORTH END BORROW SITE AND POTENTIAL TRANSPORTATION CORRIDORS (MARAD 2006-24149)

Dear Colonel Gallagher & Mr. Carter:

Please accept these comments on behalf of Cook Inlet Keeper (Keeper) on the proposed federal Clean Water Act (CWA) section 404 permit for Phase 2 of the Port of Anchorage Intermodal Expansion Project, and on the draft Environmental Assessment for the North End Borrow Site and related transportation routes for the same Project. Cook Inlet Keeper is a community-based nonprofit organization dedicated to protecting the Cook Inlet watershed and the life it sustains. Keeper represents over 600 Alaskans who support responsible development in Southcentral Alaska.

I. FACTUAL BACKGROUND

The proposed Project would fill approximately 135 acres of intertidal and subtidal habitat, and includes operational dredging of 235 acres of subtidal habitat and the construction of an 8,880-foot-long vertical sheet-pile dock face. Initial operational dredging would require removal of an estimated 3.9 million cubic yards of material from approximately 188 acres, and regular maintenance dredging would remove an estimated range of 1.5 to 4.0 million cubic yards of

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material annually, with dredged materials discharged directly into Knik Arm. Furthermore, the proposed Project would require two material sites and associated haul roads resulting in the destruction of at least 34.5 acres of wetlands. As a result, the proposed Project would result in the disturbance and alteration of 751 acres of intertidal, subtidal, upland and wetland habitat. Finally, Project construction is expected to take at least 7 years to complete.

Keeper recognizes the vital role the Port of Anchorage (POA) plays in commerce and national security in Alaska and beyond. Keeper supports the POA's upgrade provided it is preceded by adequate environmental and engineering analyses that lead to the selection of the most appropriate alternative under the National Environmental Policy Act (NEPA) and the CWA.

Unfortunately, in March 2005 the U.S. Maritime Administration's (MARAD) concluded its evaluation of the POA project with an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) under NEPA. Cook Inlet Keeper made plain in comments on the draft MARAD EA prepared in 2004 that MARAD was improperly ignoring the significant environmental impacts the project posed.[1] Consequently, MARAD should not have issued a FONSI, but instead should have analyzed the project in a full Environmental Impact Statement (EIS) before making a decision. Similarly, the U.S Army Corps of Engineers (COE) should not have permitted the initial wetlands fill for the project without undertaking an EIS.

Keeper believes that it should be obvious to both MARAD and the COE that for the purposes of NEPA, the POA project is a major federal action significantly affecting the quality of the environment and therefore requires the preparation of an EIS. Keeper also believe that it is obviously apparent that POA has not demonstrated that its preferred alternative satisfies the requirements either of NEPA or the CWA.

Thus, neither MARAD nor the COE should approve any further phases of the POA project until all NEPA and CWA requirements are met.

II. LEGAL BACKGROUND

A. National Environmental Policy Act

The National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321-4370d, is "our basic national charter for protection of the environment." 40 C.F.R. § 1500.1(a). NEPA's purpose is to promote efforts "which will prevent or eliminate damage to the environment," 42 U.S.C. § 4321, to inform the public of environmental consequences, 40 C.F.R. § 1500.1(b), and to "help public officials . . . take actions that protect, restore, and enhance the environment." Id. § 1500.1(c); *see also* Northcoast Envt'l Ctr. v. Glickman, 136 F.3d 660, 666 (9th Cir. 1998). It therefore imposes an obligation on federal agencies "to consider every significant aspect of the environmental impact of a proposed action . . . ." Baltimore Gas & Electric Co. v. Natural Resources Defense Council, 462 U.S. 87, 97 (1983) (citations omitted); *see also* 42 U.S.C. § 4332(2)(C). Thus, "NEPA ensures that important effects will not be over looked or underestimated only to be discovered after resources have been committed or the die otherwise cast." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989).

[1] *See* Letter from Bob Shavelson, Cook Inlet Keeper, to Daniel E. Yuska, Jr., MARAD/USDOT (Sept. 16, 2004).

Federal agencies must "act according to the letter and spirit" of NEPA and implementing regulations promulgated by the Council on Environmental Quality ("CEQ"), found at 40 C.F.R. §§ 1500-1508. Id. §§ 1500.1(a), 1500.3. "CEQ's interpretation of NEPA is entitled to substantial deference." Andrus v. Sierra Club, 442 U.S. 347, 358 (1979).

NEPA requires that federal agencies proposing to undertake or authorize "major Federal actions"[2] that may significantly affect the quality of the human environment prepare a detailed EIS. 42 U.S.C. § 4332(2)(C). The preparation of an EIS guarantees that "relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision." Robertson, 490 U.S. at 349.

A federal agency may first prepare an EA to help it decide whether an EIS is necessary or whether it may instead issue a FONSI. 40 C.F.R. §§ 1501.4(b), 1508.9. An EA is intended to be a "less formal and less rigorous" document than an EIS. Conner v. Buford, 848 F.2d 1441, 1446 (9th Cir. 1988); *see also* Anacostia Watershed Soc'y v. Babbitt, 871 F.Supp. 475, 481-82 (D.D.C. 1994) (EA is "not as detailed and thorough as an environmental impact statement" but is only "a preliminary inquiry to determine whether the proposed action is a major activity having significant effects on the environment."). To that end, an EA must "[b]riefly provide sufficient evidence and analysis for determining whether to prepare" an EIS. 40 C.F.R. § 1508.9(a)(1). "If an agency decides not to prepare an EIS, it[s EA] must supply a convincing statement of reasons to explain why a project's impacts are insignificant." Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1212 (9th Cir. 1998).

The legal standard for determining whether a FONSI is appropriate or, instead, that an EIS is required is whether "substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor . . . or there is a substantial dispute [about] the size, nature, or effect of the major Federal action." National Parks & Conservation Ass'n, 241 F.3d at 722, 736 (9th Cir. 2001) (internal citations omitted); see also Idaho Sporting Congress, 137 F.3d 1146, 1150 (9th Cir. 1998); Blue Mountains Biodiversity Project, 161 F.3d at 1212; Foundation for North Am. Wild Sheep v. United States Dep't of Agric., 681 F.2d 1172, 1178 (9th Cir.1982) (if the agency's action "may have a significant effect upon the ... environment, an EIS must be prepared"). In other words, it is not necessary to show that a significant effect will in fact occur. See, e.g., Greenpeace Action, 14 F.3d at 1332.

A corollary to this standard is that if there are substantial questions raised about the effectiveness of mitigation measures that purportedly reduce impacts to below a significance level, an EIS is required. Morgan v. Walter, 728 F.Supp.1483, 1491-92 (D. Idaho 1989), *citing* Foundation for North Am. Wild Sheep, 681 F.2d at 1181, and LaFlamme, 852 F.2d at 399. The threshold for requiring preparation of an EIS is "relatively low." Save the Yaak Committee v. Block, 840 F.2d 714, 717 (9th Cir. 1988); *see also* LaFlamme v. F.E.R.C., 852 F.2d 389, 398 (9th Cir. 1988) (interpreting the Congressional mandate so as to apply NEPA "to the fullest extent possible," and to "make as liberal an interpretation as we can to accommodate the application of NEPA."). Therefore, "when it is a close call whether there will be a significant environmental impact from a proposed action, an EIS should be prepared . . . . NEPA's policy goals require agencies to err in

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[2] A "Federal action" includes an action approved by a federal permit. 40 C.F.R. § 1508.18(b)(4).

favor of preparation of an EIS." National Audubon Soc'y v. Hoffman, 132 F.3d 7, 18 (2d Cir. 1997); cf. CEQ NEPA Guidance, 46 Fed. Reg. 18026, 18038 (Mar. 23, 1981) ("As a general rule . . . agencies should use a broad approach in defining significance and should not rely on the possibility of mitigation as an excuse to avoid the EIS requirement."). [3]

To decide whether there may be a significant impact on the environment, an agency must broadly consider the "context" of the proposed action and its "intensity," i.e., "the severity of impact." *See* 40 C.F.R. § 1508.27(a) (context) and (b) (intensity); National Parks & Conservation Ass'n, 241 F.3d at 731, citing Sierra Club v. United States Forest Serv., 843 F.2d 1190, 1193 (9th Cir. 1988). The regulations identify ten intensity factors that the agency should consider, 40 C.F.R. § 1508.27(b)(1) - (10), and the presence of just one factor may indicate that an EIS is required.[4] National Parks & Conservation Ass'n, 241 F.3d at 731 ("either of these [two] factors [uncertainty and controversy] may be sufficient to require preparation of an EIS in appropriate circumstances"); *accord* Public Service Co. of Colorado v. Andrus, 825 F. Supp. 1483, 1495 (D. Idaho 1993). Agencies must "bear in mind the inherent danger that the most serious environmental effects of a project may not be obvious." *City of Davis v. Coleman*, 521 F.2d 661, 673 (9th Cir. 1975). Therefore,

> Our law mandates than an agency complete an EIS where uncertainty may be resolved by further collection of data, or where collection of such data may prevent speculation on potential ... effects.

Public Citizen, 316 F.3d at 1026 (citation and internal quotation marks omitted).

Mitigation may be used to reduce the significance level of impacts to below that which requires an EIS. However, CEQ's "regulations contemplate that agencies should use a broad approach in

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[3] The permit developments will cause increased traffic in the POA area and elsewhere because of construction, the alleged increase in jobs, and increases in economic development arising out of the POA's expansion. The extent of these impacts are highly uncertain or unknown. This is especially true when the huge traffic impacts from the KATBA bridge are taken into account. Since these traffic impacts, and the associated air pollution impacts from additional traffic, may be significant, they require evaluation in an EIS. 40 C.F.R. § 1508.27(b)(5); National Parks & Conservation Ass'n, 241 F.3d at 731-32 (uncertain or unknown impacts).

[4] Among the factors in 40 C.F.R. § 1508.27(b) relevant here are:

> (1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
>
> (2) The degree to which the proposed action affects public health or safety.
>
> (3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
>
> (4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.
>
> (5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
>
> (6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
>
> (7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
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> *　　*　　*
>
> (10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

defining significance and should not rely on the possibility of mitigation as an excuse to avoid the EIS requirement." Davis v. Mineta, 302 F.3d 1104, 1125 (10th Cir. 2002) (emphasis in original). And if there are substantial questions about the effectiveness of mitigation measures in reducing the significance of impacts, an EIS is required. Foundation for North Amer. Wild Sheep v. United States Dep't of Agric., 681 F.2d 1172, 1181 (9th Cir. 1982); cf. LaFlamme, 852 F.2d at 399 ("agency must explain exactly how the measures will mitigate the project's impact.").

Under both NEPA and the CWA, the COE is obligated to evaluate the cumulative wetlands losses in the immediate area of the POA, as well as in the vicinity of POA. The cumulative wetland losses in Anchorage since the 1970s already have been significant, and the COE needs to take this fact into account in its evaluation of wetlands impacts, alternatives, and mitigation measures. See 40 C.F.R. § 1508.27(a) ("significance of an action must be analyzed in several contexts. . . . Significance varies with the setting of the proposed action . . . [I]n the case of a site-specific action, significance would usually depend upon the effects in the locale . . . . Both short- and long-term effects are relevant); see, e.g., North Cascades Conservation Council v. U.S. Forest Serv., 98 F.Supp.2d 1193, 1198, 1199 (W.D. Wash. 1999) ("proper reference point for a cumulative impacts inquiry is the entire ORV trail system . . . . [and the] impact of the existing system, and whether it can bear an increase in use").

B. Clean Water Act

The CWA was enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). The Act prohibits the discharge of any pollutant into the navigable waters of the United States except when authorized either by a permit or by an exception spelled out in the Act. Id. § 1311(a).

One of the CWA's exceptions to the sweeping discharge prohibition is found in section 404, which authorizes the Secretary, acting through the COE, to authorize the discharge of dredged or fill material into wetlands. 33 U.S.C. § 1344(e)(1) and (a). Wetlands fill activities usually require an "individual permit. 33 CFR § 323.2(g).

COE regulations governing the issuance of permits declare that "[s]ome wetlands are vital areas that constitute a productive and valuable public resource, the unnecessary alteration or destruction of which should be discouraged as contrary to the public interest." 33 C.F.R. § 320.4(b)(1); *see also id.* § 320.4(b)(2) (identifying eight types of wetland functions important to the public interest).

In furtherance of this protective policy, the COE is required to undertake a "public interest review" of the proposed discharge before issuing any COE-required permit. Id. § 320.4(a). This includes a "careful weighing of all those factors which become relevant in each particular case." 33 C.F.R. § 320.4(a)(1).[5] In its review, the COE must consider numerous criteria:

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[5] 33 C.F.R. § 320.4(a)(1) reads:

> The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. Evaluation of the probable impact which the proposed activity may have on the public interest requires a careful weighing of all those factors which become relevant in each particular case. The benefits

> (i) The relative extent of the public and private need for the proposed structure or work:
> (ii) Where there are unresolved conflicts as to resource use, the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work; and
> (iii) The extent and permanence of the beneficial and/or detrimental effects which the proposed structure or work is likely to have on the public and private uses to which the area is suited.

Id. § 320.4(a)(2). In addition to these criteria, the COE must consider "the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest." Id. § 320.4(a)(1); see also id. pt. 325 App. B. § (7)(b)(3).

The second criterion in the public interest review – whether there is a practicable alternative – is expanded upon in the so-called "404(b)(1) guidelines" established by the U.S. Environmental Protection Agency (EPA). 40 C.F.R. pt. 230. These guidelines play a critical role in the COE's pre-permitting review because the COE cannot authorize a discharge unless there is "sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with [the section 404(b)(1)] Guidelines." 40 C.F.R. § 230.12(a)(3)(iv); see 33 C.F.R. §§ 320.2(f) and 320.4(a)(1). The COE also must reject a permit application that is contrary to the 404(b)(1) guidelines, or otherwise contrary to the public interest. 33 C.F.R. § 320.4(a)(1).

Like the COE regulations, EPA's guidelines reflect a special concern for wetlands:

> From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.

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which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. The decision whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur, are therefore determined by the outcome of this general balancing process. That decision should reflect the national concern for both protection and utilization of important resources. All factors which may be relevant to the proposal must be considered including the cumulative effects thereof: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people. For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(1) guidelines. Subject to the preceding sentence and any other applicable guidelines and criteria (see Section 320.2 and 320.3), a permit will be granted unless the district engineer determines that it would be contrary to the public interest.

40 C.F.R. § 230.1(d); *see also id.* §§ 230.3(q-1) and 230.4(a) (classifying wetlands as "special aquatic sites"). Therefore, "dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact…." *Id.* § 230.1(c); *see generally* Friends of the Earth v. Hintz, 800 F.2d 822, 830-31 (9th Cir. 1986) (describing section 404 program).

The "practicable alternatives" requirement is a key provision of the 404(b)(1) guidelines intended to discourage unnecessary filling or degradation of wetlands: "No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem . . . ." 40 C.F.R. § 230.10(a). A practicable alternative is an alternative that "is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." *Id.* § 230.10(a)(2). Under this regulation, "if destruction of an area of waters of the United States may reasonably be avoided, it should be avoided." 45 Fed. Reg. 85340 (Dec. 24, 1980).

In the COE permitting processes, the burden of proof is on the permit applicant.

III. SPECIFIC COMMENTS

A. Improper Segmenting and Cumulative Impacts

As noted above, Keeper believe that the COE and MARAD improperly authorized aspects of the first phase of the POA project in violation of NEPA. For the purposes of escaping the EIS requirement, agencies may not segment a project into parts so as to avoid its classification as a "major federal action." Clearly, all aspects of the POA project are interrelated and should have been considered in a single NEPA document at the outset.

Even if MARAD and the COE had not illegally segmented the project in their initial evaluations, CEQ regulations require that an agency must consider cumulative impacts when undertaking a NEPA analysis --- including those impacts arising from all past, present and reasonably foreseeable future projects. The cumulative impacts of all phases of POA project are significant, and their existence demonstrate that the POA project is a major federal action significantly affecting the environment for the purposes of NEPA's EIS requirement. See, e.g., Thomas v. Peterson, 753 F.2d 754 (9th Cir. 1985).

Among the cumulative effects this Project may have in conjunction with existing anthropogenic activities, such as oil and gas seismic work, are oil and gas waste discharges, municipal stormwater and wastewater discharges, increased vessel traffic and associated noise, additional oil spills, and activities at and vessel traffic too and from Port MacKenzie. MARAD has failed to meaningfully consider the reasonably foreseeable effects of the proposed Knik Arm Bridge, despite the fact such a development would bisect some of the highest value beluga habitat in Cook Inlet, and would include filling hundreds of acres of tidal and subtidal beluga and beluga prey habitat.

B. Fish & Fish Habitat

The proposed Project alternative will have significant adverse impacts on fish and fish habitat. Marine fish and benthic studies conducted by Pentec for the POA and the Knik Arm Bridge & Toll Authority (KABATA) show at least 18 species of fish – and numerous invertebrates - rely on habitat in the proposed project area, including juvenile Chinook, chum and pink salmon, and Saffron cod, longfin smelt and eulachon (hooligan).[6] The direct placement of fill into at least 135 acres of this habitat will directly and indirectly impact fish, fish prey and fish habitat, and construction and maintenance dredging activities over the next decade will alter countless additional acres of fish habitat.

Furthermore, the construction of a sheet pile dock along more than 1.75 miles of shoreline habitat will eliminate slow water habitat, and force juvenile and other fish into faster moving water, where shelter from prey, resting areas and food availability would likely be diminished. This region not only plays an important role in the salmonid and other fisheries of Knik Arm and its surrounding watershed reaching into the Mat Su Valley, but also supports important fish habitat functions and values for the Ship Creek estuary and its prized fisheries.[7]

Finally, salmonid and other fish species are highly susceptible to the likely noise effects from increased long and short term pile driving and vessel traffic activities.[8] The previous MARAD FONSI states that "mitigation measures included within the proposed action would ensure that the effects are less than significant." Yet because MARAD has proposed only compensatory mitigation to offset the impacts likely to flow from the proposed Project, direct, indirect and cumulative impacts to fish, fish prey and fish habitat would be significant under NEPA.

C. Cook Inlet Beluga Whale

The perilous status of the Cook Inlet beluga whale has been known to scientists and resource managers since the mid-1990's, and NMFS latest population survey indicated approximately 278 individuals remaining from a stock that once numbered over 1000 whales.[9] In 2000, NMFS listed the Cook Inlet beluga whale as "depleted" under the Marine Mammal Protection Act. Nonetheless, contrary to NMFS's prediction, the beluga population has failed to respond to strict subsistence harvest limitations. NMFS currently is undertaking a status review to determine whether this small, isolated stock should be listed under the federal Endangered Species Act. *See* 71 Fed. Reg. 14836 (Mar. 24, 2006).

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[6] See Pentec studies at http://www.portofanchorage.org/library.html.

[7] According to the Alaska Department of Fish & Ga me, Ship Creek supported an average of 50,000 days of angler effort annually between 1998 and 2002, and according to a study done by Northern Economics, Inc., Ship Creek anglers contributed approximately $7.3 million dollars per year to the local economy over this period. As a result, Commenters support the vision promoted by the Ship Creek Enhancement Citizens Advisory Task Force in 1998 to restore Ship Creek to its potential as a fully functioning, world-class urban salmon stream.

[8] See, e.g., Popper, A.N., Fewtrell, J., Smith, M.E. and McCauley, R.D. *Anthropogenic sound: Effects on the behavior and physiology of fishes*. Marine Technology Society Journal, 37(4): 35-40. (1)(2003/04); Hastings, M.C. and Popper, A.N. *Effects of Sound on Fish. Technical report for Jones and Stokes to California Department of Transportation* (2005)(available at http://www.dot.ca.gov/hq/env/bio/files/Effects_of_Sound_on_Fish23Aug05.pdf)

[9] *See* http://www.fakr.noaa.gov/newsreleases/belugaestimate012006.htm

The U.S. Marine Mammal Commission "believes that the population is already at risk genetically," that it is "by all conservation standards, already at a dangerously low level," and that it "continues to believe that listing this population under the Endangered Species Act is warranted" (Marine Mammal Commission 2004, at 4, 7). In June 2005 written comments, the Commission recommended to NMFS that it should "promptly" begin a status review under the Endangered Species Act and that it should "proceed directly to publication of a proposed listing rule" (Marine Mammal Commission 2005, at 4 (emphasis added)). The Commission went on to say that "As for the merits of a proposed listing, the Commission believes that the case is clear.... This seems to constitute a compelling case for listing [under the Endangered Species Act]" (Marine Mammal Commission 2005, at 4, 5 (emphasis added)).

The U.S. Marine Mammal Commission does not stand alone among the experts in making this recommendation. The Cook Inlet beluga whale population qualifies for listing as "Endangered" under the Red List Criteria of the prestigious International Union for the Conservation of Nature and Natural Resources and would qualify for listing as "Critically Endangered" under the International Union's criteria if a continuing decline could be shown.[10] See also the comments previously submitted on the POA project by the National Marine Fisheries Service (NMFS).

Keeper will not rehash the substantial literature documenting the importance of Knik Arm and the proposed Project area to the beluga's feeding, birthing and life cycle needs, but instead incorporate herein by reference the NMFS Draft Conservation Plan,[11] conservation group comments on that plan,[12] and related NMFS scientific formation.[13]

The proposed Project will significantly impact the beluga directly and indirectly, through the loss of intertidal and subtidal habitat due to fill and dredging activities, and through the degradation of high value habitat due to noise. POA and KABATA studies show the beluga not only utilizes the proposed Project area, but that Knik Arm possesses some of the highest value beluga habitat in Cook Inlet. Furthermore, noise from pile driving and increased ship traffic could significantly affect beluga transit through the POA/Point MacKenzie corridor.

There is simply no way that the potential adverse impacts from the POA project to the Cook Inlet beluga population can be mitigated sufficiently in order to reduce these impacts below the significance level for the purposes of NEPA's EIS requirement. For all intents and purposes, both MARAD and the COE must treat the beluga as endangered under NEPA. In any event, because the POA project poses huge risks to the beluga and its habitat, an EIS is required.

D. Dredging.

The dredging that will be associated with construction and operation of the POA project has the potential for causing significant direct, indirect, and cumulative environmental impacts. In

[10] Lowry, L.F., O'Corry-Crowe, G., and Goodman, D. In press (2006) *Delphinapterus leucas* (Cook Inlet population). In: IUCN 2006. *2006 IUCN Red List of Threatened Species.*

[11] *See* http://www.fakr.noaa.gov/protectedresources/whales/beluga/management.htm#conservation

[12] *See* Letter from Bob Shavelson, Cook Inlet Keeper, et al. to Jim Balsiger, NMFS (2005).

[13] *See* http://www.fakr.noaa.gov/protectedresources/whales/beluga/research.htm

addition to adverse noise impacts on local species, dredging may irretrievably alter critical fish and beluga whale habitat.

There is no alternative habitat that can be used as replacement habitat for Ship Creek-bound fish and the beluga whale once the dredging has occurred, and therefore this potentially significant impact cannot be reduced in order to escape NEPA's EIS requirement. Thus, an EIS is required to evaluate these impacts.

Federal and state agencies have paid little heed to increased sedimentation and dredging rates in and around the POA over the past decade. While numerous theories might explain why sediment loads increasingly choke vessel docking and transit channels in and around the POA, the recession of glaciers in the upper Cook Inlet watershed caused by marked changes in climate conditions – and the increased sedimentation attendant to such recessions - appears to offer a possible explanation. In any event, major questions exist concerning increased sedimentation and associated dredging. These should be analyzed in an EIS. The agencies should begin long term studies immediately to understand anticipated sedimentation rates, their impact on the POA and the environment.

E. Major Engineering Issues.

From the start of this process , MARAD has presumed the open cell sheet pile design to be the preferred alternative, and has disregarded federal agencies and other experts who question the safety and other aspects of this design. For example, the USFWS and NMFS have expressed strong reservations in numerous instances about the significant impacts to beluga whales and salmonid and other fish in and around the proposed Project area.[14] Additionally, various engineers have drawn into question the safety and stability of the proposed sheet pile design during anticipated seismic events.[15] The importance of the seismic stability questions raised cannot be overstated: MARAD has gone to great lengths to highlight the importance of the POA to commerce and military readiness, yet according to engineers well-versed in seismic impacts, a catastrophic failure to a sheet pile dock would render the POA inoperable for many weeks if not months. While MARAD may certainly weigh the economic implications when deciding what alternatives are practicable, it cannot flatly ignore expert opinions contradicting MARAD's preferred approach. These expert opinions raise significant questions about the design and about the potential significant adverse environmental impacts related to design choice. These potential impacts, in turn, cannot be mitigated below the level of significance with any level of certainty. Thus, an EIS is required.

F. Major Socio-Economic and Other Impacts.

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[14] *See., e.g.,* Letters from NMFS to MARAD (Sept. 17, 2004; Dec. 9, 2004; Apr. 7, 2005 & June 1, 2005)

[15] *See* D.R. Chapman & G. Fernandez, *Port of Anchorage Potential Expansion Project, Open Cell Sheet Pile Design Concept Independent Geotechnical Review* (2002); Moffatt and Nichol Engineers, *Port of Anchorage Expansion Project, Review of Alternative Structural Concepts* (2002); and Geotechnical Advisory Commission, Municipality of Anchorage, *June 2005 Briefing on Port Expansion Status to Geotechnical Advisory Commission and Clarification of GAC Resolution 2004-01* (2005).

When there is a "reasonably close causal relationship between a change in the physical environment and the effect at issue," the effect must be considered in the NEPA document. Metropolitan Edison Co. v. People Against Nuclear Energy, 460 U.S. 766, 767 (1983). This includes a social or economic effect. Sierra Club v. Marsh, 769 F.2d 868, 877-80 (1st Cir. 1979); 40 C.F.R. § 1508.14 (EIS must discuss social and economic effects which are interrelated with environmental effects); *see also* City of Davis, 521 F.2d at 675 (the permit's "raison d'etre ... [is growth-inducement and] with growth will come growth's problems: increased population ... and increased demand for services such as utilities, education, police and fire protection, and recreational facilities").

The POA, MARAD, COE have trumpeted the huge economic benefits to Anchorage and the State of Alaska of the POA project, pointing to the thousands of new jobs and other economic impacts that will arise out of the project's construction and aftermath. In addition, MARAD has trumpeted the national security importance of the POA project. The potential of these significant direct socio-economic benefits from the POA project, as well as its indirect and cumulative socio-economic impacts, combined with its environmental impacts, is another factor requiring the preparation of an EIS.

G. Clean Water Act.

Without repeating its objections here, Keeper agrees with the comment made by the EPA in its letter to the COE dated March 22, 2006, that the alternative proposed is not the least damaging, practicable alternative as required by the CWA's section 404(b)(1) guidelines and the COE's permitting regulations.

Furthermore, Keeper notes that on whole the EPA letter raises multiple unresolved problems and uncertainties about the project concerning significant issues, which again points to the need for an EIS. This is also true for similar letters to the COE from the NMFS and the U.S. Fish & Wildlife Service on the proposed project.

IV. CONCLUSION

Thank you for the opportunity to comment on this important project. Cook Inlet Keeper largely supports the comments made by the U.S. Fish and Wildlife Service, EPA and the NMFS in the course of this permit application. As stated, Keeper supports the responsible expansion of the POA. To date, however, MARAD and the COE have made inadequate efforts to assess the POA project's environmental impacts, to ensure that it is properly designed, or to develop a mitigation plan for unavoidable impacts.

If COE believes that a FONSI under NEPA might be appropriate, before it makes its decision the COE must make available for public review and comment a draft Environmental Assessment ("EA"). *See* Anderson v. Evans, 371 F.3d 475, 487 (9th Cir. 2004) ("The public must be given an opportunity to comment on draft EAs and EISs, and public hearings are encouraged to facilitate input on the evaluation of proposed actions", citing 40 C.F.R §§ 1503.1, 1506.6); accord Citizens for Better Forestry v. U.S. Dep't of Agriculture, 341 F.3d 961, 970 (9th Cir. 2003) ("Citizens were deprived of the opportunity to comment on the USDA's EA and FONSI at all points in the rulemaking process. This deprivation violated their rights under the regulations implementing NEPA," citing 40 C.F.R. §§ 1501.4(b) and 1506.6"); Western Watersheds Project v. Bennett, 392 F.Supp. 2d 1217, 1222 (D. Idaho, 2005) ("Here, the BLM obtained no public input on the draft Simplot and RCI EAs before issuing the Final Grazing Decisions based on those EAs. That failure violates NEPA under the Ninth Circuit case law cited above."); see also 40 C.F.R. § 1501.4(e)(2)(i)-(ii). At the same time, the COE should also make available a draft decision and a draft permit, as this will further facilitate public understanding and comment under both the CWA and NEPA.

Please feel free to contact me at 907.235.4068 ext. 22 or bob@inletkeeper.org if you have any questions, and please ensure I receive all future public notices and other information related to the proposed Project.

Very truly yours,

Bob Shavelson
Cook Inlet Keeper

Cc: (VIA EMAIL ONLY)
Marcia Combes, EPA Alaska Operations Office
Rowan Gould, USFWS Alaska Regional Office
James Balsiger, NMFS Alaska Regional Office
Hon. Mark Begich, Municipality of Anchorage
William Sheffield, Port Director
Mike Frank, Trustees for Alaska
Second Chief Lee Stefan, Native Village of Eklutna
Chief Gary Harrison, Chickaloon Village Traditional Council
Ryan Winn, Army Corps of Engineers

COOK INLETKEEPER®
PROTECTING ALASKA'S COOK INLET WATERSHED AND THE LIFE IT SUSTAINS

VIA EMAIL ONLY
kevin.j.wilson@poa02.usace.army.mil

June 5, 2007

Colonel Kevin J. Wilson
Army Corps of Engineers
P.O. Box 898
Anchorage, AK 99505

RE: PORT OF ANCHORAGE EXPANSION (POA-2003-502-N, SHIP CREEK)

Dear Colonel Wilson:

Cook Inletkeeper is a community-based nonprofit organization with over 600 members in Southcentral Alaska dedicated to protecting the Cook Inlet watershed and the life it sustains.

Inletkeeper understands the Corps is preparing to issue the necessary permits and Record of Decision (ROD) regarding the Port of Anchorage expansion. I am writing now to reiterate a final time the Corps will be in violation of the National Environmental Policy Act (NEPA) and related statutes if it issues such documents without making an Environmental Assessment (EA) or Environmental Impact Statement (EIS) publicly available for notice and comment prior to such issuance.

As noted in our letters dated March 23, 2007, March 22, 2006, and September 16, 2004, MARAD and the POA have failed to consider the various practicable alternatives that produce fewer impacts to fish and fish habitat in and around the vicinity of the Port. Importantly, as numerous documents in the project record demonstrate, these alternatives are both technologically and economically feasible, and under existing law, the impacts from this project must be minimized before any mitigation options may be pursued.

Inletkeeper has long-held that the size, scope and potential impacts from the proposed Port Expansion require the completion of an EIS, and we believe caselaw in the 9th Circuit strongly supports our position. Yet even if the Corps disagrees on the need for an EIS, it certainly must recognize the basic need to provide the public with an EA for notice and comment purposes prior to issuing the relevant permits and ROD.

The Department of the Army has repeatedly promised that it will actively solicit and respect the public's views on important public projects, stating:

P.O. Box 3269, Homer, Alaska 99603 · p. 907.235.4068 · f. 907.235-4069 · www.inletkeeper.org

"The sustainable futures of our installations and our communities are inextricably connected... *The public has a collaborative stake in our decisions and we value their involvement as partners in sustainability and environmental stewardship*. ...We will strengthen and build new community partnerships to achieve sustained and sound environmental stewardship through Communication, Coordination, Consultation, and Collaboration."[1]

"The Corps believes in communicating effectively to build synergistic relationships that serve the nation. USACE is committed to respecting the views of individuals and groups interested in Corps activities, listening to them actively, and learning from their perspectives. *Success can only be achieved by communicating, building relationships and reaching out to all partners and stakeholders – governmental, non-governmental organizations and the public.*"[2]

If the Corps fails to solicit public comment on a draft EA, it will breach the Department policy to actively engage the public and to respect and incorporate the public's views on important public projects during the Department's decision-making process. The Anchorage Port Expansion can and should proceed in order to fulfill the cargo and related needs of Alaska's Railbelt and other communities. However, the lack of adequate public process, coupled with the failure to seriously consider the practicable alternatives noted by numerous agencies and commentors, makes the current process legally suspect. Accordingly, I hereby request, again, for the Corps to issue for public notice and comment the draft EA for the proposed project before issuing the ROD and relevant permits.

Thank you again for your attention to this matter, and please do not hesitate to contact me if you have any questions.

Very truly yours,

Bob Shavelson
Executive Director

Cc: VIA EMAILONLY
Mike Frank, Esq., Trustees for Alaska
Phil Brna, USFWS
Michael Carter, MARAD
Kaja Brix, NMFS
Marcia Combes, EPA
Stewart Seaburg, ADNR
David Wigglesworth, MOA

[1] See Excerpts from the *Army Strategy for the Environment 2004 at* http://www.asaie.army.mil/Public/IE/Toolbox/about_this_site.html (emphasis added).
[2] See http://www.asaie.army.mil/Public/IE/Toolbox/pl_ace.html (emphasis added).

SEISMIC GUIDELINES FOR PORTS

Written by the Ports Committee of the
Technical Council on Lifeline Earthquake Engineering,
American Society of Civil Engineers

**Technical Council on Lifeline Earthquake Engineering
Monograph No. 12
March 1998**

Edited by Stuart D. Werner

ASCE

Published by the
American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191-4400

EXHIBIT M

6.7.3 Past Seismic Performance of Sheet Pile Bulkheads

The seismic performance of steel sheet pile bulkheads during past earthquakes has generally been very poor. As has been observed with gravity walls, deformations of sheet pile structures with marginal stability and/or weak, compressible foundation soils will lead to deformations of the backfill soil, thereby affecting other nearby structures.

Experience has shown that the potential damage modes for steel sheet pile structures include: (a) excessive deformations of the wall (either at the top of the wall or below the anchor) due to excessive liquefaction-induced soil movement and the flexibility of the sheet piles, which can contribute to these deformations; (b) tie-rod/wale failure; (c) anchor pull out; (d) deep-seated shear; and (e) kicking out of the toe of the wall due to the loss of passive soil resistance below the dredge line. The movement of the wall will result in corresponding lateral and vertical soil movements in the backland. This ground deformation has caused damage to buried structures and deep foundations, and has suspended operation of sensitive equipment adjacent to the waterfront (e.g., gantry cranes, cargo handling systems).

Liquefaction effects have been particularly damaging to sheet pile structures. Whereas the sliding resistance of massive and rigid gravity retaining structures helps to resist the increase in active earth pressures due to liquefaction of backfill soils, sheet pile structures are relatively light and flexible. In addition, a loss of passive soil resistance at the anchor and at the toe of the wall beneath the dredge line can result in catastrophic failures of sheet pile walls. The common modes of failure of the anchor have included: (a) passive failure of soil in front of anchors; (b) tie rod failure; (c) wale system failure; (d) loss of passive soil resistance beneath the dredge line; (e) interlock failure between sheet piles; and (f) global instability when founded on weak soils In addition, batter-piled anchors are vulnerable because of the very stiff connection of the piles to the pile cap. As a result, the combined effects of lateral ground movements and cyclic loading involving concentrated loads at the pile-anchor connection can lead to structural degradation of the piles at the anchor.

The 1993 Guam Earthquake ($M_w = 7.7$) represents a notable example of the seismic performance of sheet pile structures during past earthquakes (Vahdani et. al., 1994; Mejia and Yueng, 1995). This earthquake generated ground surface motions in the vicinity of the ports that have been estimated to be about 0.25 g to 0.30 g. These ground motions resulted in the following damage to sheet pile retaining structures: (a) liquefaction of backfill soils adjacent to the sheet pile wall and anchors, which caused up to 24 to 36 in. of lateral movement and 18 to 24 in. of settlement; (b) disruption of rail-mounted gantry cranes and surface drainage due to differential settlement; (c) movement of the sheet pile structure and lateral spreading, which caused severe pavement cracking which was particularly extensive near the deadman, about 80 to 100 feet from the structure; and (d) structure failures, which resulted in bulging of the ground surface in front of the walls.

pile systems, and away from the historic use of batter piles. Further discussion of the performance of these pile-supported marginal wharves during the Loma Prieta Earthquake is provided in Section 6.5.3.

The piles along the mainland portions of the Port of Kobe, Japan that were shaken during the 1995 Hyogoken Nanbu Earthquake provide an important example of the seismic performance of piles under levels of seismic shaking that were much stronger than the ground shaking experience at ports in the San Francisco Bay area during the Loma Prieta Earthquake. During a reconnaissance of the port after the earthquake, Werner and Dickenson (1996) noted the following trends: (a) minimally-reinforced hollow concrete cylinder piles often suffered severe cracking or fracture at their connection to the pile cap; (b) solid concrete cylinder piles in large groups often appeared to perform well in the presence of large lateral movement of the surrounding soils; (c) steel pipe piles at the Fourth Reclamation Area suffered moderate buckling, and steel pipe piles at the Takahama Wharf reportedly exhibited damage at the interface of loose soil and underlying dense soil layers due to excessive localized curvature demands at this interface; and (d) piles that supported buildings and bridges near the waterfront appeared to limit movement and damage to the overlying structure, despite large movement of the adjacent soils. It is noted that the subsurface damage to the piles at the Takahama Wharf was not evident immediately after the earthquake and, in fact, the supporting wharf structure did not exhibit any apparent distress. However, the pile damage was discovered during subsequent underwater inspections of the piles, and was sufficiently severe to require subsequent replacement of much of the wharf structure ant its pile foundation supports.

6.4.4 Guidelines for Developing Seismic Performance Requirements for Piles

Seismic performance requirements for pile supports at port structures should be established in accordance with the considerations outlined in Section 6.2. Generally, these requirements should reflect the importance of the overlying structure to overall port operations, and other port system performance requirements. If extended downtimes of the overlying structure are unacceptable, the seismic performance requirements for the piles should be such that damage to the pile should be limited, localized, and readily repairable with only limited and tolerable disruptions of operations of overlying structure.

6.4.5 Guidelines for Preliminary Seismic Vulnerability Assessment of Piles

Piles in marine environments are difficult to assess visually because most of the lengths of such pile are underwater or are embedded in an earthen embankment or in the underlying soil. This difficulty is partly mitigated by the common understanding that the greatest deterioration of piling is in the splash zone which is generally visible; however, potential damage or reduced seismic capacity may be buried.

To perform a vulnerability assessment, the engineer should first develop an understanding of expected structure performance and potential embankment movement that might impact that performance. This understanding will help identify areas where damage systems, the vertical piling supports the vertical loads, and a combination of the batter piling and vertical piling supports the horizontal loads. As discussed later in this chapter, batter piles have often not been designed and detailed to have adequate strength, ductility, and toughness when subjected to lateral earthquake load and deformation demands. As a result, they have usually performed poorly during earthquakes.

6.4.2 Functional/Operational Requirements of Piles

Piles are a preferred structural foundation element for marine facilities because they allow foundation construction in dry conditions, while fully addressing the need to support structures over the water. Their function is to provide foundation support for port waterfront, cargo handling and storage, and infrastructure components, which are typically located on loose, saturated soils with a potential for liquefaction during an earthquake. This foundation support is provided by transmitting the structure loads generated by dead and live loads, operating conditions, and natural hazards down through these soil materials (in friction or in end bearing) to underlying more competent soil layers.

6.4.3 Past Seismic Performance of Piles

Chapter 2 has summarized numerous examples of the performance of pile-supported port structures during past earthquakes. This summary shows that vertical pile systems with adequate seismic design and detailing at their connections to the pile cap and at locations of large curvature demands along their length have performed well during earthquakes. In contrast, batter piles systems or inadequately designed and detailed vertical pile systems have performed poorly and sustained damage that has often been substantial.

Experience during past earthquakes shows that batter piles at ports have been particularly susceptible to damage during earthquake shaking. This is because these piles are typically designed by assuming relatively little moment fixity at their connection to the other elements of the structure. As a result of this common design approach, these connections have only limited ductility, which limits the pile's energy-absorbing capacities and ability to resist seismic excitations without damage, particularly where there is any soil movement. While batter piles are still being used by some ports in seismic areas, their connections must be carefully detailed with the understanding that only limited ductility is available.

The seismic performance of pile-supported waterfront structures at the Port of Oakland during the 1989 Loma Prieta Earthquake provides a direct comparison of the performance of port structures on batter pile supports vs structures on vertical piling. As noted in Chapter 2, the structures on vertical piling designed as ductile moment resisting frames (at the Howard Terminal) performed well, whereas nearly all of the batter piles deployed at the nearby Seventh Street Terminal fractured or severely cracked at their connection to the overlying structure. This good seismic performance of vertical piling had been predicted over a 10-year period prior to the earthquake, as many local port authorities (including the Port of Oakland) had been transitioning toward a standard wharf approach using all vertical

PORT OF ANCHORAGE
POTENTIAL EXPANSION PROJECT

OPEN-CELL SHEET PILE DESIGN CONCEPT
INDEPENDENT GEOTECHNICAL REVIEW

By:

David R. Chapman, P.E. - LACHEL & Associates, Inc.

Gabriel Fernandez, Ph. D., Geotechnical Engineer

August 2002

LACHEL & ASSOCIATES
Geotechnics & Underground Structures

Gabriel Fernandez, Ph. D.
Geotechnical Engineer

EXHIBIT N

PORT OF ANCHORAGE POTENTIAL EXPANSION PROJECT
INDEPENDENT GEOTECHNICAL REVIEW

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PORT OF ANCHORAGE EXPANSION
OPEN-CELL SHEET PILE DESIGN CONCEPT
INDEPENDENT GEOTECHNICAL REVIEW

I. EXECUTIVE SUMMARY

This report documents an independent geotechnical review of an open-cell sheet pile design concept that has been proposed as an alternative for expansion of the Port of Anchorage, Alaska. The review was conducted by David R. Chapman, P.E., Chief Geotechnical Engineer for LACHEL & Associates, Inc. (L&A) and Gabriel Fernandez, Ph.D., Geotechnical Engineer, at the request of R&M Consultants, Inc. (R&M) of Anchorage, Alaska, port engineers for the Port of Anchorage. R&M's representative for this study was Duane M. Anderson, Chief Structural Engineer.

Two documents by Peratrovich, Nottingham, and Drage, Inc. (PND) of Anchorage, Alaska provided definition of the concept that was evaluated, and were transmitted to L&A for review. These documents are:

- Port of Anchorage Expansion Study - March, 2002 - marked "Draft."
- Letter Report from Dennis Nottingham, P.E., of PND to Governor Sheffield, Port Director, dated May 9, 2002, providing additional information for the previous study.

The work for this study is described in Chapter II, and basically consisted of review of background geotechnical information regarding the site, development of conceptual models for soil stratigraphy and properties, use of these models in conducting engineering analyses to assess stability and potential settlement of the proposed structures, and reporting on the results of this evaluatio, specifically assessing the feasibility of applying the concept at the Port of Anchorage.

The summary of findings described here, and indeed the results for the entire independent geotechnical review must be understood in light of the following factors:

- The proposed dock face of the potential new construction is 400 feet seaward from the existing dock face, and no borings have been taken at that location specifically to evaluate the potential new construction.
- The available borings cover existing operational areas and facilities in the Port, as well as investigations for some potential Port facilities that have been evaluated over the years.

- Significant extrapolation was required to develop the geologic models used for the study, and the study should be viewed as a feasibility level concept evaluation based on existing geotechnical information from the general area, with no data available at the specific site of the proposed facilities. It should be noted, however, that significant corroborative information exists to support the primary features of the geologic model described herein, as described in Chapter IV and using data provided in Appendix B of this report. It is consistent with the use of friction piles in such a material by TAMS and Shannon and Wilson in previous designs at the Port of Anchorage.

The work scope for the present study excluded operational factors associated with the proposed open-cell dock concept such as ship impact, dredging requirements, and structure life considerations such as corrosion and abrasion, ice forces, wave forces, and other environmental factors. It is our understanding that these factors will be addressed and structural behavior of the open-cell sheet pile structure will be evaluated by others based on loadings provided from the results of this study.

Summary of Findings

Basic conclusions related to the geotechnical aspects of the proposed open-cell sheet pile concept for expansion of the Port of Anchorage resulting from the evaluations and analyses performed in this study are summarized below:

1. Geotechnical Characterization - Four main strata were identified in the area covered by the available geotechnical reports. An upper tidal flat silt deposit, generally 30 ft thick, that overlies a medium to dense gravelly sand layer of varying thickness ranging from zero to about 25 ft, which in turn rests on a 100 ft to 120 ft thick interval of the Bootlegger Cove Formation. The Bootlegger Cove Formation is the most prevalent deposit within the proposed open-cell sheet pile dock foundation area. A dense glacial outwash underlies the Bootlegger Cove materials. The glacial outwash deposits below the Bootlegger Cove Formation do not influence the stability of the proposed cell.

   An assessment of the engineering properties of the pertinent site strata indicates that the shear strength of the materials in the Bootlegger Cove Formation, in both drained and undrained conditions, controls the stability of the cell under both static and seismic loading conditions. Furthermore, the estimated shear strength of the materials of the Bootlegger Cove formation is significantly lower than the shear strength of the cell foundation materials described in the PND study.

2. Global Stability Analysis - Global stability analysis entails consideration of stability of the entire structure, with the cells and soil fill acting as a unit, using conventional slope stability analysis methods. The estimated factors of safety for global stability of the proposed cell at the end of construction (0.7 to 1.05) are well below those acceptable in normal engineering practice (1.2 to 1.5). These values are indicative of a high probability for the development of stability problems during construction or excessive cell deformations at the end of construction. The estimated factor of safety values at long-term are marginally acceptable (1.2 to 1.4), compared to a desired value of 1.5. However, the estimated factor of safety of the cell under seismic loads corresponding to the design earthquake (0.4 to 0.6) is grossly inadequate and is indicative of catastrophic displacements under the corresponding ground motions.

3. Internal Stability Analysis - Internal stability analysis involves determination of the interaction between the earth and groundwater pressure loadings on the dock face and the resistance forces that can be mobilized by the tail-walls. Estimates were made for the magnitude and distribution of the soil and ground water pressures applied on the front face of the cell under static and seismic loading conditions. Where tidal flat silt deposits exist for depths of 15 to 20 feet below the -35 ft (MLLW)[1] dredge depth, acceptable ratios of tail-wall resistance to cell face loading can be obtained under static conditions. This is not the case where Bootlegger Cove Formation materials are present at this level, a condition indicated by borings to be likely over a significant length of the bulkhead alignment. Under the design seismic loading, a global cell failure is anticipated and the internal stability is academic since the entire structure would be within a sliding soil mass. Achieving adequate seismic resistance if no global failure occurred would require increasing the length of the tail walls as a minimum.

4. Settlement Estimates - Settlements of the proposed open-cell sheet pile structure were estimated to be 20 to 24 inches including consolidation settlement in the clays and compression of the cell fill materials. The latter would transfer load to the sheet piles and likely cause additional penetration into the seabed. Both would affect the amount of freeboard which must be provided in the design. This calculation is also somewhat academic since adequate global stability would be required for consolidation to occur.

5. Overall Conclusion - On the basis of the available information and the analyses performed in this evaluation, it appears that the foundation materials at this site are significantly less

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[1] *All elevations herein are referenced to Mean-Lower-Low Water (MLLW), which is assumed to be at elevation +0.0 feet, unless described otherwise in the text. Elevations referencing a Mean Sea Level datum are followed by (MSL).*

favorable than those upon which the PND stability analyses were based. The height of the proposed open-cell sheet pile dock necessitates the presence of hard foundation materials to provide adequate global stability under static and seismic loading conditions and to minimize cell distortions. Although such materials were encountered on the west shore of the Knik Arm at the Port Mackenzie Dock Facility, beneath the footprint of the now-eroded portion of the Elmendorf Moraine, they do not appear to be present at the Port of Anchorage area. Founding the proposed 80-foot high open-cell structure on these materials does not appear feasible.

Recommendation

Recommendations are given in Chapter X. The primary recommendation, however, is to perform borings at specific planned facility locations to obtain the necessary geotechnical information for concept evaluation and design. The Bootlegger Cove Formation materials will affect construction of expansion facilities, requiring that they be characterized. Recommended features of such a geotechnical investigation include:

- Borings should penetrate to 120 to 150 feet below the seabed elevation, and possibly through the Bootlegger Cove Formation materials into underlying glacial sands and gravels. Borings will need to be taken from jack-up rigs to provide the required level of stability and the time on hole required to drill to the required depth.
- Additional borings should be drilled between the current and proposed locations in order to permit assessment of areal extent of various soil layers as well as variations in thickness. Such programs can best be performed in an iterative fashion, with results of earlier borings used to optimize siting of later borings. Otherwise, a preliminary layout of several potential concepts can be used to optimize siting of borings to cover multiple purposes and thereby achieve a more economical and efficient site investigation.
- A sampling program should be designed to perform classification and index testing at regular intervals throughout the depth of the boring, and to recover high-quality undisturbed samples for laboratory strength and consolidation testing.

costs for alternative concepts, which may need to blend elements of earth fills, conventional pile-supported structures, open-cell sheet pile structures, and perhaps other alternatives.

Recommendations

Several specific recommendations are warranted, based on the information reviewed and the conditions which exist at the Port of Anchorage:

1. Granular Fill - Selection of granular fill for placement as cell fill for open-cell sheet pile structures should be performed with care to ensure that material with fines contents (material passing the #200 sieve) less than 5% are available for placement below the mid-tide level (approximately +16 ft), and for some distance behind the cell face. This will result in a material which is amenable to densification by vibration to achieve a state of compaction with an adequate margin of safety against liquefaction under the design contingency-level earthquake. Compaction of fill at the depths proposed for the open-cell sheet pile concept is a challenging task, and should be aided by provision of suitable material.
2. Foundation Piling Through Fills - Piles for support of crane rails were shown in the proposed design concept. For the soil model that was analyzed and the global stability problems that have been identified for that model, large lateral loads on the piles would develop as soil mass displacements occurred, resulting in damaging or destructive displacements. For any concept involving piling placed within fills, particular attention to ensuring adequate stability of fills is advised for all design conditions. Even if a complete global stability failure did not occur, damaging levels of lateral loading could be applied to the piles by movements in the earth mass.
3. Geotechnical Investigation - As indicated above, borings at specific planned facility locations are recommended to obtain the necessary geotechnical information for concept evaluation and design. The Bootlegger Cove Formation materials will affect construction of expansion facilities, requiring that they be characterized. To evaluate the proposed location of the open-cell sheet pile dock structure, 400 feet seaward from the existing dock face alignment, it is recommended that borings penetrate to 120 to 150 feet below the seabed elevation, and possibly through the Bootlegger Cove Formation materials into underlying glacial sands and gravels. This will require that borings be performed from jack-up rigs to provide the required level of stability and the time on hole required to drill to the necessary depth, in view of the water depth and tidal and current conditions. Depending on the concepts to be evaluated, it is also advisable to drill additional holes between the current and proposed locations in order to permit assessment of areal extent of various soil layers as well as variations in thickness. This will allow the range of conditions present to be bracketed and permit optimization of facility layout and design to best deal with the site geotechnical conditions.

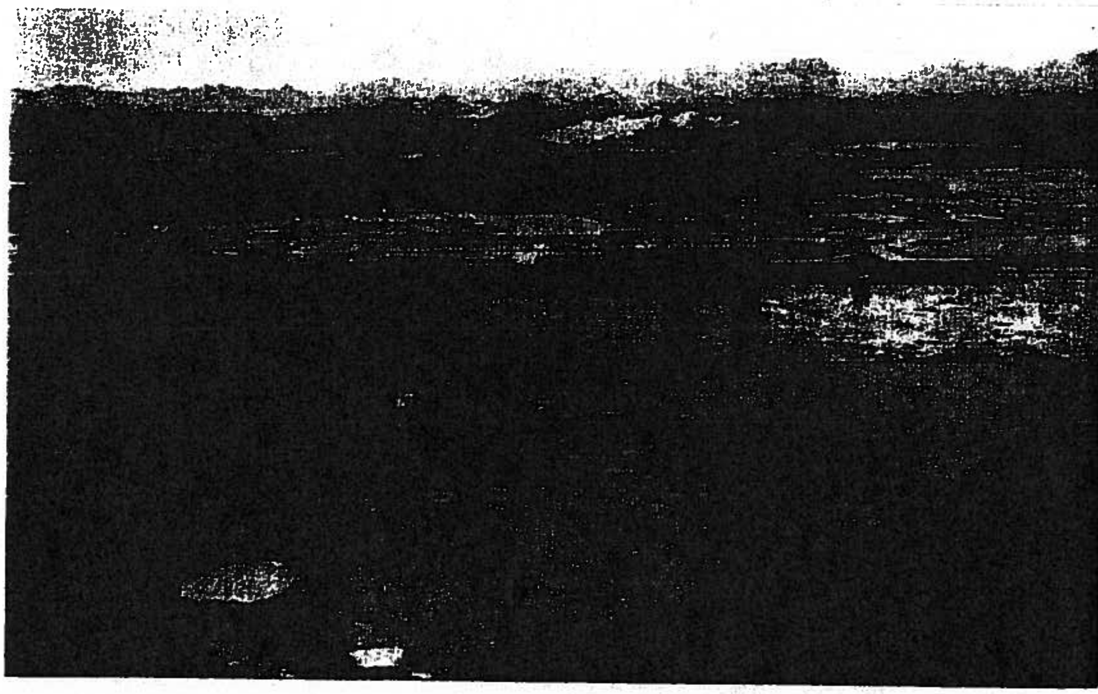
A sampling program should be designed to perform classification and index testing at regular intervals throughout the depth of the boring, and to recover high-quality undisturbed samples for laboratory strength and consolidation testing. Extrusion of samples in the field should not be allowed, and extreme care should be applied to handle, transport, and store samples to prevent their alteration by mechanical disturbance or freezing. It is recognized that the tidal flat silt deposits may not be amenable to sampling using Shelby tubes, but samples should be recovered by the best means possible to permit testing for classification and index test as well as engineering properties tests. Such programs can best be performed in an iterative fashion, with results of earlier borings used to optimize siting of later borings. Otherwise, a preliminary layout of several potential concepts can be used to optimize siting of borings to cover multiple purposes and thereby economize on site investigation costs.

PORT OF ANCHORAGE

EXPANSION PROJECT

Review of Alternative Structural Concepts

October 31, 2002



Prepared By:

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Long Beach, CA 90807

EXHIBIT O

TABLE OF CONTENTS

1.0 INTRODUCTION

Moffatt & Nichol Engineers was asked to evaluate two basic structural concepts for facility upgrades/expansion at the Port of Anchorage. General comments as to the pros and cons of the two concepts are presented as well as findings from some specific structural analysis. The most significant of these findings is the low Factor-Of-Safety for the interlock stresses in the open-cell sheetpile concept as proposed. A second significant concern is the overall global stability of the open cell sheetpile structure as analyzed by Lachel & Associates. M&N's evaluation and comparison of the two concepts have raised issues with each of the concepts which is based on limited geotechnical data and have tried to offer technical considerations to deal with those issues. A discussion of alternative concepts has also been included.

At this point, it is difficult to draw any conclusions as to the best approach to expansion the Port should take. The primary reason for this is the two basic concepts offer significant differences to expansion options. Many of the issues we have identified can be refined or mitigated through technical design, but this will have an impact on construction schedule and cost. In an effort to organize information derived for the two basic concepts, a matrix is included in the conclusions section.

2.0 SCOPE OF REVIEW

Two structural concepts have been proposed for the expansion of the Port of Anchorage. These concepts are:

1. A pile-supported wharf concept (PSW).
2. An open-cell sheetpile wharf concept (OCSPW).

Six documents were referenced during this evaluation, as follows:

(1) "Masterplan, Final Report", dated September 30, 1999, by TranSystems Inc. (TS), in association with the firms of Tryck Nyman Hayes, Inc., Northern Economics, Leeper, Cambridge and Campbell, the Boutet Company, and Ogden Beeman Associates.

(2) "Port of Anchorage Intermodal Marine Facility, Progress Report", dated March 2002, by Tryck Nyman Hayes (TNH), in association with the firms of Parsons Brinckerhoff, Inc., Coffman Engineering, Shannon & Wilson, Inc., and The Glosten Associates, Inc.

(3) "Port of Anchorage Expansion Study", dated March 2002 by the firm of Peratrovich, Nottingham & Drage, Inc. (PND).

(4) Letter Report from Dennis Nottingham, P.E., President of PND to Governor Bill Sheffield, Port Director, Port of Anchorage, dated May 21, 2002.

(5) "Port of Anchorage Intermodal Marine Facility, Draft Environmental Assessment", dated October 2001.

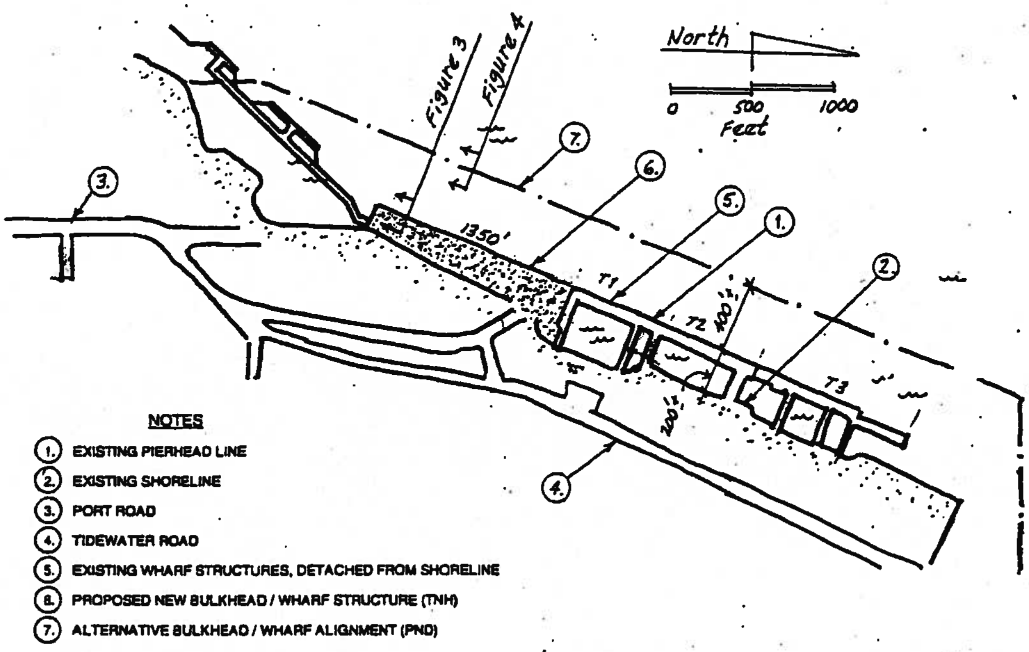

FIGURE 2

5.0 PILE-SUPPORTED WHARF CONCEPT (PSW)

The PSW concept is shown in Figure 3 and is described in the "Port of Anchorage Intermodal Marine Facility Progress Report" dated March 2002. The concept includes the following major elements:

- 1,350-foot long by 120-foot wide high load capacity (1,000 psf live load) concrete deck supported by 48-inch diameter steel pipe piles. This multi-purpose cargo wharf will be capable of servicing container cargo, dry bulk cargo (primarily cement), the military, cruise ships and other project specific cargo. This wharf will occupy the space of the existing POL No. 1 and POL No. 2 terminals and the wharf face will align with and connect to the existing wharf near the southern end of Terminal 1. Fenders and provisions for future 100-foot gage container cranes rails are also included.

- A cellular sheetpile structure behind the pile supported wharf to provide a seamless transition between the cargo wharf and the upland area.

- A 1,500-foot long Petroleum and Lubricants (POL) dock with two POL terminals. This POL dock will include pile-supported breasting/mooring dolphins, POL towers, catwalks and a 28-foot wide access trestle. These terminals will be located directly south of the high load capacity cargo terminal and at an angle.

- A seasonal small craft float with a 120-foot long by 6-foot wide gangway connecting it to the cargo wharf.

- An initial dredged depth to the current –35 feet with planned future depth of –45 feet and provisions for a maximum depth of –55 feet, all based on MLLW datum.

The above concept would be part of the Master Plan Phase I infrastructure improvements as outlined in Port of Anchorage's, "Masterplan, Final Report".

The following are observations and opinions with respect to the structure type, materials, loading, constructibility, and functional concerns.

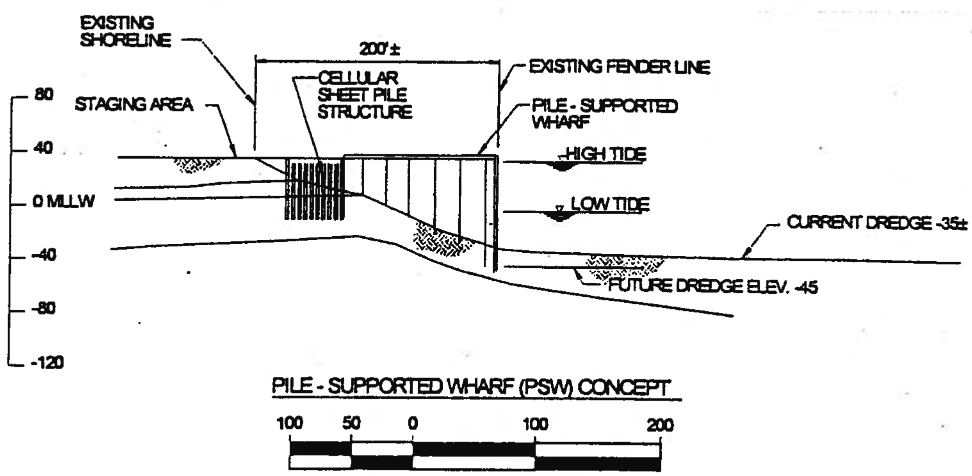

FIGURE 3

5.1 WHARF STRUCTURAL SYSTEM

The proposed PSW structural system for the concrete deck cargo wharf is widely used in areas where seismic design is a major consideration. Design criteria and methodology for the proposed PSW structural system are well-established.

- The proposed PSW structural system can be designed to meet the latest seismic design criteria for piers and wharves (including POL facilities) in accordance with

- Effects of underwater noise disturbances from construction related activities on the behavior of beluga whales. Beluga whale is a marine mammal that is listed as depleted by the National Marine Fisheries Services (NMFS) and as a species of special concern by the Alaska Department of Fish and Game (ADF&G). This impact will probably be less than for the PSW concept due to the anticipated shorter construction time.

- Effect on water quality due to increased siltation from construction related activities including filling behind the sheetpile structure.

7.0 OPERATIONAL COMPARISON OF BULKHEAD CONCEPTS

The PSW concept referenced in Report (2) above develops the concept suggested in the Port's Masterplan. It shows a conceptual design and cost estimate for closed-cell sheetpile bulkheads with outboard pile-supported concrete decks built along the existing berthing line. This would be considered a conventional approach to design at the Port of Anchorage.

The OCSPW concept referenced in Report (3), proposes a less conventional system that moves the berthing line offshore and creates full continuity between the wharf and existing backland via reclaiming the land behind the new pier head. This concept significantly increases port terminal acreage and improves the operational efficiency of the vessel loading/unloading operations.

The concept of moving the berthing line offshore is not dependent on using the OCSPW system and could be achieved using a pile supported structural system with a rock dike retaining fill that would result in a similar increase in new acreage. In fact, a PSW type structure could allow for an ultimate pier head depth of –55 feet where the OCSPW type structure may not.

The increased terminal operating efficiency from a new berthing line offshore from the current alignment accrues from:

- Travel distance between the gantry cranes and staging area can be shortened and optimized for a particular vessel and stevedoring situation.
- Vessel hatch covers can be stored on the ground immediately behind the gantry cranes, as opposed to stored (juggled) aboard the vessels. This reduces crane moves and allows more efficient unloading/loading.

It should be noted that the efficiency gains described above are non-critical. In other words, at best, they represent slight decreases in the time required to load and unload vessels. Cost benefits may accrue to the shipping companies, but the cargo can be handled with or without these benefits. These small incremental gains in efficiency are not as advantageous as they might be elsewhere in the world since the Port of Anchorage is not competing for cargo.

The existing container gantry cranes are 50-foot gage. Most state-of-the-art container terminals today utilize a gage of 100 feet. The 100-foot gage is operationally advantageous when more than three cranes are deployed simultaneously on a single vessel. The requirement for cranes on a particular vessel is a function of:

- Size of vessel
- Total number of containers to be discharged and loaded
- Port time allocated in vessel rotation

50-foot gage cranes with appropriate backreach can be used as effectively as 100-foot gage cranes provided the booms reach far enough. Thus, 100-foot gage cranes may be desirable at some point, but should not be considered as essential. Regardless of which concept for the wharf is adopted, the new wharf structure should include 100-foot gage crane rails, or both 50 and 100-foot gage crane rails.

The OCSPW concept has some potential disadvantages:

- It requires extending, relocating and/or abandoning existing wharf infrastructure, and replacement with new fixtures, pipelines and utilities resulting in increased cost. Under the current Port Masterplan, portions of the existing wharf structures and infrastructure are retained and only incremental wharf widenings and lengthenings are constructed on an as-needed basis. It is unclear if this cost consideration for the OCSPW concept has been included. However, the existing Port Masterplan and the PSW system does not address expansion needs beyond 2020. The proposed OCSPW plan or an otherwise acceptable structural concept to move the bulkhead offshore may have a distinct advantage in terms of accommodating growth beyond 2020.
- Global failure of the bulkhead system if it occurred would, most likely, result in loss of crane rails and cranes or use of cranes. This would eliminate the port's capability to operate at the affected terminal. The port complex at Anchorage is considered a lifeline facility and the ability to continue in operation after a major seismic event is critical and strategic.
- Partial failure of the bulkhead system would most likely involve offshore translation and outward rotation of the bulkhead sections, or failure of the connection point between the cell elements. This could isolate cranes on opposite sides of the failed area, making operations very difficult, or even making cranes unusable until repairs can be completed. This type of damage is very time consuming to identify and repair, as well as costly. In comparison, failure of pile-supported deck type wharf structures is typically characterized by pile and deck damage above the water line, where inspections and repairs can normally be readily identified and accomplished.

A comprehensive seismic event analysis including life cycle costs should be performed and would include:

- Total construction costs of the alternative systems
- Estimation of the probable seismic event with reference to the planning horizon/life of the facilities
- Estimation of damage as a result of the two-level seismic event scenarios

- Estimation of port capability immediately after the seismic event
- Estimation of the time and cost of recovery

This analysis of the cost of the "days after" an event usually leads to a decision to increase the seismic resistance of certain critical facilities above the "norm".

The use of an open-cell sheetpile bulkhead in a deep water critical port environment, as in the OCSPW concept and at the proposed face heights (80-90 feet +/–), has very limited actual seismic experience from which to draw conclusions.

With respect to special berthing/loading/unloading operations such as barge landings with ramp up and/or multiple handling of cargo with "stepped" wharf facilities, neither concept indicated a specific way to do this. We consider this type of operation to be one that could be designed into any wharf concept adopted.

8.0 ALTERNATIVE WHARF CONCEPTS

Alternative concepts that could be considered for the port's expansion project include:

- Pile-supported cargo wharf in combination with a tied-back sheetpile bulkhead.
- Pile-supported cargo wharf in combination with an open-cell bulkhead.
- Pile-supported cargo wharf in combination with a rock dike retained backland.
- Pile-supported cargo wharf integral with a relieving platform structure on the landside.

Pile-supported Cargo Wharf with Sheetpile Bulkhead. This concept is similar to the one proposed for the PSW except the cellular sheetpile structure is replaced by a tied-back sheetpile wall. The height of this sheetpile wall would be between 20 and 30 feet. Either steel sheetpile or precast/prestressed concrete sheetpile could be used, however in this situation, concrete is not recommended. The tied-back anchors could be concrete dead-men, sheetpile dead-men or batter piles.

Pile-supported Cargo Wharf with Open-Cell Bulkhead. This concept is similar to the one proposed for the PSW except the cellular sheetpile structure is replaced by an open-cell sheetpile structure. The height of the open-cell structure would be between 20 and 30 feet, considerably shorter than the 80 feet proposed in the OCSPW concept. To increase the backland area, the cargo wharf face could be moved out into the bay. Stability of the open-cell structure would dictate its location and in turn what the PSW width would be in cross-section.

Pile-supported Cargo Wharf with Rock Dike Retained Fill. This concept is similar to the one proposed for the PSW except the cellular sheetpile structure is replaced by a rock dike retained fill. This concept is similar to most all the modern wharves in the Ports of Los Angeles and Long Beach and the U.S. Navy's Aircraft Carrier wharves in San Diego. This is also a standard method in many parts of the country. The height of this rock dike would depend on the pier head location. To increase the backland area, the

LACHEL & ASSOCIATES

Geotechnics & Underground Structures

November 18, 2002

Mr. Duane Anderson, P.E.
Chief Structural Engineer
R&M Consultants, Inc.
9901 Vanguard Drive
Anchorage, Alaska 99507

Subject: Port of Anchorage – Proposed Open-Cell Sheet Pile Expansion Concept
Parametric Slope Stability Analysis/Review of Recent Laboratory Test Results

Dear Mr. Anderson:

As requested and authorized in your e-mails of October 21 and October 24, 2002, the enclosed memorandum documents the subject stability analysis for cases developed and outlined by R&M in the October 21 e-mail. It also provides a review of the recent laboratory test results that were obtained for samples from Boring TH-1.

A graph is provided comparing the results of static and seismic loading analyses for dredge elevations of –35 and –45 feet MLLW and for alternatives of dense silt and gravelly sand. Results indicate substantial clay shear strength is required for adequate safety factors. The review of laboratory testing results on lean clay samples indicates some degree of overconsolidation in the samples, potentially due to the proximity to the Elmendorf Moraine. However, the confining pressures used in the test significantly exceeded in situ effective overburden pressures. Thus, these results may not properly reflect in situ strength. It is further cautioned that these results are from a single location and previous review indicated substantial variation over the potential construction area. It remains important to obtain and test samples from the area and depth range potentially affected by imposed stresses from large proposed depths of fill.

We trust this information will help in your ongoing evaluation of expansion concepts for the Port of Anchorage. We would be pleased to assist in any way that would be beneficial; particularly in defining laboratory testing conditions to obtain appropriate shear strengths for use in more specific stability analyses.

Sincerely,
LACHEL & Associates, Inc.

David R. Chapman

David R. Chapman, P.E.
Chief Geotechnical Engineer

C: Gabriel Fernandez, Ph.D.
Dennis J. Lachel

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EXHIBIT P

PORT OF ANCHORAGE – OPEN-CELL SHEET PILE EXPANSION CONCEPT
PARAMETRIC SLOPE STABILITY ANALYSIS and
EVALUATION OF RECENT LABORATORY TESTING RESULTS

This memorandum documents the results of a parametric slope stability analysis for a potential vertical bulkhead concept for possible application in constructing expanded facilities at the Port of Anchorage. This concept was reviewed previously as documented in an August 2002 report prepared by LACHEL & Associates, Inc. (L&A) and Gabriel Fernandez, Ph.D., Geotechnical Engineer. The work documented in this memorandum was requested by Duane Anderson of R&M Consultants, Inc. (R&M), of Anchorage, Alaska to include evaluation of several combinations of stratigraphy and soil properties in the port area that R&M considered pertinent.

The August 2002 L&A/Fernandez report contained global stability analysis of the proposed open-cell sheet pile bulkhead concept which were performed using the computer program PCSTABL6. An overall physical model of the dock area cross section and a generalized stratigraphic model of the underlying soils had been developed from the results of numerous historical borings in the Port of Anchorage area evaluated as part of the August 2002 study. In an October 21, 2002 e-mail, R&M outlined three additional slope stability cases to test various assumptions and hypotheses about the situation at the proposed dock location. This location is some 400 feet seaward from the existing dock face, beyond the coverage of borings taken for previous projects. L&A's assistance in analyzing these cases was requested, and subsequently authorized in an October 24, 2002 e-mail from Duane Anderson of R&M.

In addition, a test boring at the new dock face was performed after the completion of the August 2002 L&A/Fernandez study. R&M provided results of laboratory testing and also requested a brief review and documentation of comments on the test results in conjunction with the reporting on the stability analysis.

SLOPE STABILITY CASES REQUESTED BY R&M

The details of the cases outlined by R&M are described below:

1. **CASE 1** – The following basic features were requested by R&M. Discussion to clarify and compare with the August 2002 study are documented in italics where warranted:
   - Seismic: Change surcharge to 200 psf *(versus 1000 psf used in previous study – presumably this reduction is in light of small probability that maximum surface area loading would occur in conjunction with design earthquake).*

- Seismic: Change tide and phreatic surface elevation to mean tidal level of +15,3 ft MLLW. ***(Value of +19 feet had been used in the previous study as the water surface elevations in fills behind bulkheads are typically a little higher than the mean tidal level based on measured values at Port Mackenzie. The current analysis used +15.3 ft as the phreatic surface elevation and +0.0 (MLLW) as the tidal elevation. This change makes a very small difference in the calculated factor of safety.)***
- Seismic: Change seismic coefficient to 0.20 g to agree with Municipality of Anchorage guidelines. ***(vs 0.23 from PND's Port of Anchorage Expansion Study Draft of March 2002.)***
- Seismic: Assume Zone 3 is drained, use $\phi = 35°$. ***(Note that Zone 3 refers to terminology of August 2002 report and describes gravelly sands, not modeled in original cross section because it was not considered that they were continuous over the entire area of the proposed dock and because they varied significantly in thickness. However, the dense silts were modeled as frictional materials with $\phi = 35°$ and thus this condition is implicitly satisfied by the existing model).***
- Change Gravel Fill to $\phi = 35°$ to match PND model. ***(Was 38° previously, but this will not dramatically affect results)***

This model was to be run to get new baseline factor of safety values for potential dredge elevations of –35 and –45 ft MLLW ***(-45 was used before as it was described as a proposed future dredge elevation).*** Further, under these conditions, it was requested to determine what shear strength of Zone 4 materials (Bootlegger Cove Clay) is required to achieve a factor of safety of 1.1 under seismic loading conditions for both dredge elevations?

2. **CASE 2** – This was to be an extension of the Case 1 model, with the following requested features, and discussion:
   - Revise bottom of Zone 3 material to elevation –65 ft MLLW below the proposed dock face. ***(Existing model has bottom of dense silts at -65 ft MLLW, implicitly satisfying this condition).***
   - Revise the friction angle, ϕ, of Zone 3 material to 45°. ***(Borehole TH-1 encountered substantial thickness of gravel. This was accomplished in the model by changing the friction angle of what had been the dense silt to 45°, considering it as gravel.)***
   - Leave undrained shear strength of Zone 4 material (Bootlegger Cove Clay) at 2000 psf, and calculate factor of safety at dredge elevation of –35 and –45 ft MLLW.
   - Determine Zone 4 shear strength required for a factor of safety of 1.1 under seismic loading conditions at both dredge elevations.

3. **CASE 3** – This is the "final build" or long term case, extended from Case 1 and Case 2, with the following requested features and discussion.
   - Seismic: Change Zone 4 materials to drained, $\phi = 28°$. ***(It makes sense to use drained shear strength parameters to analyze this case for static conditions. However, with these low-permeability materials, seismic loading will result in undrained conditions. The values were calculated as requested, but they are not considered to be correct, and are useful only for comparison purposes.)***
   - Consider Zone 3 material as $\phi = 45°$. ***(Values were calculated for $\phi = 35°$ and 45°).***
   - Calculate factor of safety for dredge elevations of –35 and –45 ft MLLW.

SLOPE STABILITY ANALYSIS RESULTS

The analysis was conducted using PCSTABL6 for the conditions described above for the requested cases. Circular slip surfaces were analyzed using the modified Bishop method. Results from Case 1 and Case 2 were plotted in terms of factor of safety versus undrained shear strength for overall comparison on Figure 1.

Static Loading – End of Construction Cases - For Case 1, the end of construction static case was analyzed for both dredge elevations, as a baseline prior to adding seismic loading and varying the shear strength of the Bootlegger Cove Clay. This case models the undrained conditions that exist in the foundation immediately after construction before dissipation of the large pore pressures induced in the foundation by the weight of the fill. For the –45 ft dredge elevation, the factor of safety was 0.99, compared to 1.14 for the –35 ft dredge elevation. Plots showing the problem geometry and critical failure circles are included in Appendix A. The primary difference between the factor of safety values for the different dredge elevations seems to be due to the self-weight of the unexcavated materials rather than the soil's shear strength. This conclusion is based on a comparison that was made using different shear strengths for soils between elevations –35 and –45 ft.. These factor of safety values are plotted on Figure 1 as individual points corresponding to an undrained shear strength of 2,000 psf, the baseline value for the Bootlegger Cove Clay.

The Case 2 end of construction cases indicated factors of safety of 1.24 and 1.11 for the –35 and –45 ft dredge elevations respectively. These are also plotted on Figure 1 as individual points corresponding to an undrained shear strength of 2,000 psf.

Seismic Loading Cases - Seismic cases for Case 1 and Case 2 are plotted for undrained shear strengths ranging from 2,000 to 6,000 psf. Values for factor of safety for shear strength less than 4,000 psf are all less than 1.0. For the Case 1 conditions, with the dense silts having a friction angle of ϕ= 35°, the maximum factors of safety calculated for dredge elevations of –35 and –45 ft were 1.17 and 1.06, respectively, for undrained shear strengths in the clay of 5,000 and 6,000 psf. For the cases with shear strengths lower than 5,000 psf, critical circles were very large and deep. As the strength increased to the point where the deep circles were no longer critical, critical circles were found in the frictional materials immediately below the end of the sheeting.

Three plots of problem geometry and critical circles from Case 1 seismic loading analyses are included in Appendix B to illustrate the variation of failure pattern with undrained shear strength. This shows that for undrained shear strength equal to 4,500 psf in the Bootlegger Cove Clay, the critical circles are very large and deep. This was true for all values of shear strength lower than 4,500 psf as well. For undrained shear strength equal to 5,000 psf, some deep circles appear, but the most critical circle is very shallow, immediately below the bottom of the sheet piling. For the 6,000 psf case, all the critical circles depicted are shallow circles. This pattern agrees with expected results in that as the deeper soils become firmer, the resulting critical circles are shallower. With a firm base, the frictional properties of the shallower materials govern global stability, hence the asymptotic behavior observed in Figure 1 for the Case 1 conditions where the surface materials have ϕ= 35°.

For the Case 2 conditions, considering ϕ= 45° for the gravelly sands, a factor of safety equal to 1.1 under seismic loading was calculated for an undrained shear strength of 4,500 psf for the deep clay materials. The calculated factor of safety continued to increase with increasing undrained shear strength of the clays, reaching values close to 1.4 for both –35 and –45 ft dredge elevations at an undrained shear strength of 6,000 psf. For Case 2 conditions, deeper circles remain critical throughout the range of undrained shear strength considered, because of the extremely high friction angle assigned to the gravelly sands.

CASE 3 – Long-Term Case – This case simulates behavior after sufficient time has elapsed for construction-induced pore pressures to dissipate. The Bootlegger Cove Clay was modeled with parameters of ϕ' = 28° and c' of 200 psf, as was done in the August, 2002 study. Analyses were performed for cases where either dense silts (ϕ' = 35°) or gravelly sand (ϕ' = 45°) were present above the Bootlegger Cove Clay. Results are documented in the following table:

Results for CASE 3 – Long Term Static Loading

Dredge Elevation ft MLLW	Calculated Factor of Safety	
	Silt - ϕ' = 35°	Gravelly Sand - ϕ' = 45°
-35	1.70	1.85
-45	1.45	1.58

As requested, factors of safety were also calculated for seismic loading cases, and ranged from 0.90 to 1.06 for the range of conditions represented by the cases in the above table. However, these values are not considered correct or appropriate, because the Bootlegger Cove Clay will not behave in a frictional manner (i.e., drained) under seismic shaking since the pore pressures generated by cyclic shear stresses will not dissipate quickly. Appropriate shear strength values for the clays under seismic loading were documented under Case 1 and Case 2 above, and are significantly lower than values described for Case 3, except for the higher end of the shear strength range that was considered.

SUMMARY OF CONCLUSIONS FROM SLOPE STABILITY ANALYSIS

The conclusions drawn from the parametric slope stability analysis requested by R&M and described in this memorandum are summarized below:

1. For the Case 1 End of Construction Analysis, with undrained shear strength of 2,000 psf in the Bootlegger Cove Clay and ϕ= 35° in dense silts above the clay, calculated factors of safety are lower than acceptable, at 1.14 for –35 ft dredge elevation and 0.99 for –45 ft dredge elevation.
2. For the Case 1 Seismic Analysis, undrained shear strength in the Bootlegger Cove Clay would have to exceed 4,500 psf in order to achieve a factor of safety of 1.1 under seismic loading conditions for the –35 ft dredge elevation. A factor of safety of 1.1 is not achieved regardless of clay shear strength for the –45 ft dredge elevation. This is because of the loss of dead weight (due to additional 10 feet of dredging) that contributes to shear strength of the shallower frictional materials (ϕ= 35°) where the failure surface is located.
3. For the Case 2 End of Construction Analysis, with undrained shear strength of 2,000 psf in the Bootlegger Cove Clay and ϕ= 45° in gravelly sands above the clay, calculated factors of safety are marginal, at 1.24 for –35 ft dredge elevation and 1.11 for –45 ft dredge elevation.
4. For the Case 2 Seismic Analysis, undrained shear strength in the Bootlegger Cove Clay would have to be at least 4,500 psf in order to achieve a factor of safety of 1.1 under seismic loading conditions. This applies to both dredge elevations, the difference in results from Case 1 being due to the higher frictional shear strength (ϕ= 45°) for gravelly sands above the clay.
5. For the Case 3 Long Term Conditions (Static), using drained shear strength for all subsurface materials, acceptable factors of safety of 1.45 to 1.85 resulted for the range of dredge depth and friction angle of shallower materials considered. Under seismic shaking, however, the factors of safety would essentially be those of Case 1, as cyclic shear stresses would produce excess pore pressures leading to undrained conditions.

Overall, the results of the analysis show that the high loadings imposed by the proposed bulkhead configuration require high shear strengths in the clayey foundation materials even if there are 30 feet of gravelly sands with extremely high friction angles overlying the clays. For lower shear strengths, the failure circles are very deep, and daylight well behind the proposed dock face.

EVALUATION OF SOIL BORING AND LABORATORY TEST RESULTS

Laboratory test results for the test boring (designated TH-1) that was performed since the completion of the August, 2002 study were presented in a Peratrovich, Nottingham, and Drage (PN&D) report, "Preliminary Geotechnical Program Report – Port of Anchorage Expansion," dated October 2002 and designated PN&D 02023. This report included PN&D discussion and interpretation as well as the log of the boring and laboratory test results as listed below:

- 4 - Unified Soil Classification
- 4 - Grain Size Analyses (3 – sieve only, 1 – sieve and hydrometer)
- 1 – Atterberg Limits determination
- 6 – Moisture Content

- 3 – Dry Unit Weight
- 1 – Unconfined Compression Test
- 5 – Consolidated Undrained Triaxial Tests with pore pressure measurements

The following discussion is focused on results for the silty clay that was the subject of most of the testing.

Boring Log for TH-1

This borehole was completed on September 21, 2002 to a 57-foot depth into the sea bottom. From the mudline at elevation –35.9 MLLW, the top 32 feet of soil were classified as silty gravel, with the underlying soil to the bottom of the boring described as silty clay with a trace of coarse sand. The gravel contained a two-foot thick seam of silt. In the clay, one drive sample was obtained, with an SPT N-value of 17. The other samples were obtained using 3-inch diameter Shelby tubes. Pocket penetrometer test results varied from 1.5 to 2.5 tsf. Both the blow count and pocket penetrometer results would lead to a soil consistency description of "stiff to very stiff."

Classification and Index Test Results for Clay

The grain size analysis that was performed on a clay sample from the 40 ft depth showed 100 percent passing the #200 sieve and approximately 50 percent finer than 2 microns. Atterberg Limits determination yielded a Liquid Limit of 43 and a Plasticity Index (Liquid Limit minus Plastic Limit) of 22, leading to a classification of lean clay, designated CL by the Unified Soil Classification System. Measurements in the triaxial test samples indicated moisture contents ranged from 25 to 28 percent, and dry unit weights ranged from 94 to 105 pcf at increasing confining pressures, yielding total unit weights ranging from 120 to 131 pcf. The moisture contents were 4 to 7 percent above the Atterberg Plastic Limit of 21 percent. These results need to be reconciled with previous measurements of similar index properties in the same deposits along the entire length of the present dock foundations.

Interpretation of Triaxial Test Results

Significant conclusions obtained from evaluation of data from 5 consolidated-undrained triaxial tests and one unconfined compression test are:

1. Effective stress circles at failure result in a relatively well-defined drained shear strength envelope with an effective cohesion C' = 1.5 psi or C' = 200 psf and a friction angle ϕ of about 28° to 29°. These parameters are consistent with the plasticity of the soil materials and the degree of preconsolidation in-situ. Similar strength parameters were used in the August 2002 L&A/Fernandez report for long-term global stability evaluations.

2. Measurements of shear-induced pore water pressures in the triaxial tests indicate some degree of preconsolidation to the clay materials at this location. As indicated in Table 1 at the end of the report, the pore pressure coefficient A_f at failure ranges from 0.16 for the lower effective confinement of 20 psi to 0.35 in the triaxial tests with a higher effective confinement of 60 psi.

   A_f coefficients of 0.16 are associated with overconsolidation ratios of about 3.5 while A_f coefficients of 0.35 are associated with consolidation ratios of about 2.0. Thus, the estimated preconsolidation pressures for the in-situ clays range from:

   20 psi x 3.5 = 70 psi (10,080 psf)
   60 psi x 2.0 = 120 psi (17280 psf)

   This compares to an effective preconsolidation pressure of 12,000 psf for the Bootlegger Cove clay materials that was estimated in the August 2002 L&A/Fernandez report based on the present elevation of the bluffs east of the port area.

3. The triaxial tests results given in Table 1 also indicate that the undrained shear strength, S_{uf} of the clay materials increases as the initial effective confinement pressure increases. A graphical representation of the relationship between the undrained shear strength of the clay and the initial effective confinement, obtained from the triaxial tests results is shown in Figure 2. (The effective confinement for the unconfined compression test was taken as the effective overburden pressure at the sample depth).

   As indicated in this graph the undrained shear strength of the sample tested with an initial confinement of 20 psi is about 2650 psf, while a shear strength of about 5000 psf was measured on the sample tested with an initial confinement of 60 psi.

4. The tendency shown by the triaxial test results would lead one to believe that at the undrained shear strength of the clay materials could increase with depth as shown in the following table. We have some reservations in this regard.

Undrained Shear Strength vs Effective Confining Pressure

Effective Confinement psi (psf)	Depth Below Mud Line, ft	Undrained Shear Strength psf
20 (2880)	46	2600
40 (5760)	92	4300
60 (8640)	140	5000

Although some increase of shear strength with depth might be possible, the available triaxial test results must be taken with caution and additional testing is required to establish the actual increase of undrained shear stress with depth. The basic arguments for this caution includes

a) The triaxial test data provided by Alaska Test Lab indicates that as the initial effective confinement increased the dry unit weight of the clay materials also increased and the natural water content decreased as shown in the following table. This behavior is expected in the triaxial test set up where samples taken at any given depth expel water and become denser (higher dry unit weights) as the initial confining stress exceeds the in situ effective stress at the depth of sampling. These samples were obtained at depths ranging between 40 ft and 56 ft, corresponding to effective in-situ stresses varying from 18 psi to 25 psi, respectively.

Triaxial Test Conditions, Sample Properties, and Undrained Shear Strength

Test Number	Initial Confinement Psi	γ_d* Dry Unit Weight pcf	Water Content %	Undrained Shear Strength psi
2002 111	20	93.8	29.4	19
2002 109	40	96	29.9	31
2002 108	40	103.9	22.6	35.5
2002 112	60	102.3	24.8	36
2002 113	60	105.3	24.1	36

* Assumed to be γ_d values prior to shear.

Thus the triaxial test samples consolidated at 40 psi and 60 psi initial confining pressures were most likely "densified" or consolidated to pressures above their in situ effective confining pressures in the laboratory prior to shear.

b) The Bootlegger Cove data in the port area reviewed in the August, 2002 L&A/Fernandez report, Appendices B and C, do not show any significant increase in dry unit weight, γ_d, or any significant reduction of water content, w%, with depth. Furthermore, the only trend detected in the variations in dry unit weight of the Bootlegger Cove clay materials is pointed out in Appendix C (page C-19), and indicate that:

"The dry unit weights (<u>of the clays</u>) range from 85 pcf to 119 pcf and average about 100 pcf. The three higher values (above 109 pcf) were reported at the north end of the site. In fact the unit weight data in figure 10a is strongly biased to the northern end of the site because of over 70% of

the available determinations were made north of Station 57.0 (<u>the north end of the present dock facilities</u>). The determinations south of Station 57.0 have an average of about 96 pcf."

* Underlining added.

5. Obtaining information from Boring TH-1 was a useful exercise, and showed that samples of reasonable quality could be obtained for testing. It is, however, only one boring and may or not be representative of average conditions in the proposed area of port expansion. In our opinion it is still necessary to take good quality samples at deeper elevations within the Bootlegger Cove clay and along the length of potential new facilities. This will allos a more complete assessment of the variation of undrained shear strength with depth in the potential zone through with critical failure circles can pass. The initial effective confinement for testing of these samples, however, should correspond to the effective in-situ stress to minimize sample "disturbance". For the tests discussed herein, the 40 psi and 60 psi confining pressures exceeded this guideline. It is also recommended to perform in situ strength measurements in the clay deposits by means of a cone penetrometer with the capability to measure pore pressures. This type of testing avoids the effects of sample disturbance for the low plasticity clays at considerable depths. Obtain cone penetrometer test data may necessitate boring through surficial layers that contain gravel that could cause cone refusal.

Additional Issues

Two additional issues related to the strength of the Bootlegger Cove clay warrant discussion:

1. Because of the presence of the Elmendorf Moraine immediately upstream (north) of the port of Anchorage area, the Bootlegger Cove clay materials at the northern end of the proposed fill area might have experienced a preconsolidation pressure larger than in the center and southern portions of the area to be affected by the proposed dock facilities. Boring TH-1 is located in the north area of the proposed fills. Therefore, the undrained shear strength of the clay materials at this location might be better than the average value over the remaining portion of the proposed fill.

   It is also important to notice that the review of the available soil data in the port area in (Appendix C) in the August 2002 L&A/Fernandez report indicates that the thickness of the gravel layer above the clay deposits varies significantly in the north-south direction. Thus, the clay deposits south of Boring TH-1 might be present at shallower elevations with lower initial effective confinements.

2. Figure 2 of the PN&D report includes a total stress envelope, developed based on the results from unconfined compressive strength tests, as well as CU triaxial tests. A reading of the text in the report appears to indicate that such an envelope might have been used to assess the overall stability of the fill immediately after construction. In our opinion this procedure will lead to misleading results.

The use of a total stress envelope in the global stability analysis of the proposed fill results in an unrealistically high strength of the clay materials underneath the fill because in this analysis the weight of the fill is credited to produce an increase in the shear strength of the materials underneath. This increase in strength cannot be realized at this stage because the pore pressures have not dissipated yet! The unrealistically high strength of the clay materials results in an unrealistically high factor of safety.

It is a basic tenet of soil mechanics that shear strength parameters c_1 and ϕ from a total stress envelope do not have a physical meaning. Global stability analysis for end of construction and seismic loadings can be carried out using the undrained shear strength of the clays measured at various initial effective confinement values representative of the effective in-situ stress within the deposit.

Figure 1 - Port of Anchorage - Proposed Expansion - Parametric Slope Stability Analysis

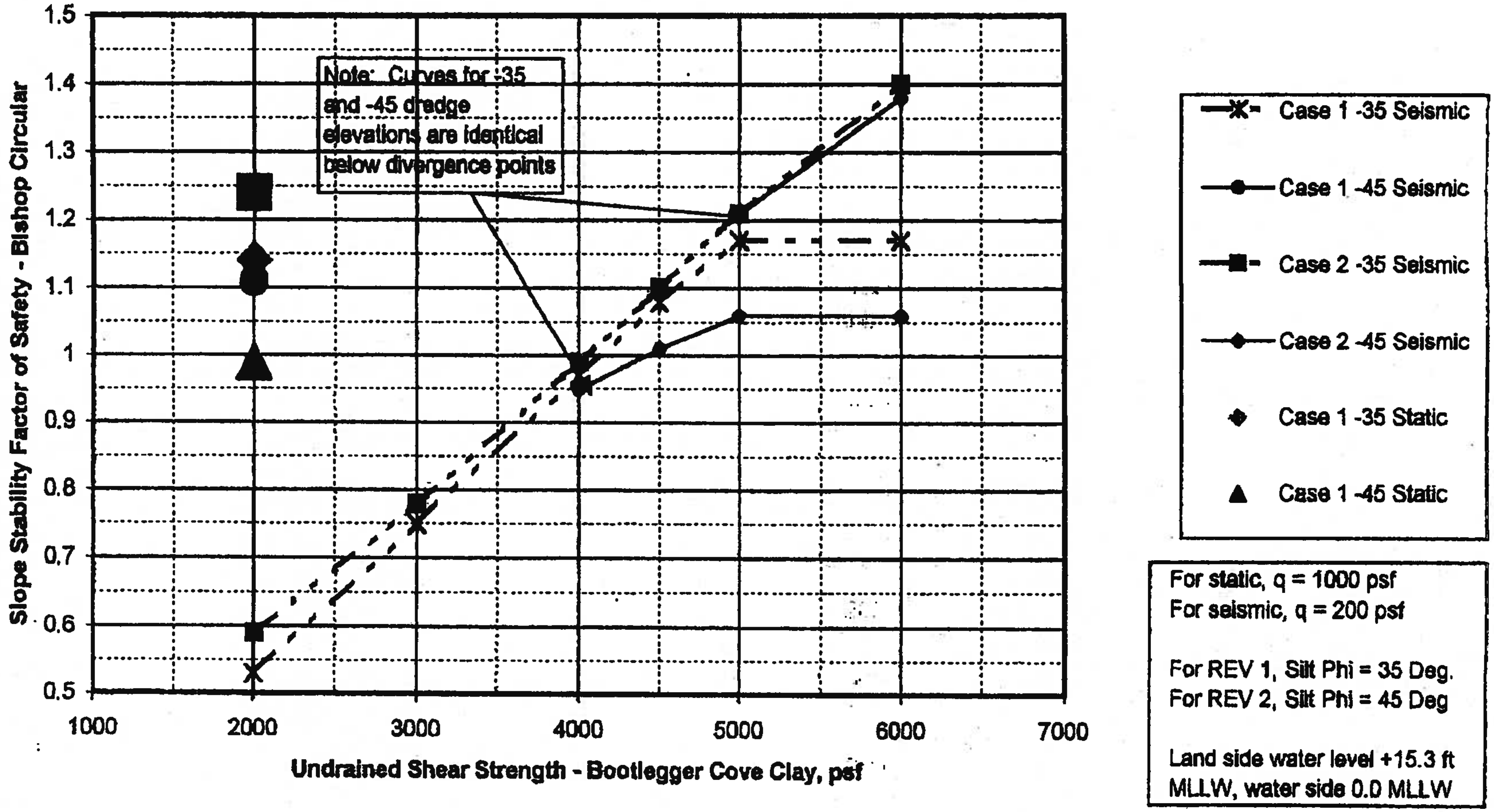


Figure 2 - Port of Anchorage - Borehole TH-1 - Shear Strength Testing Results
Undrained Shear Strength vs Effective Confining Pressure

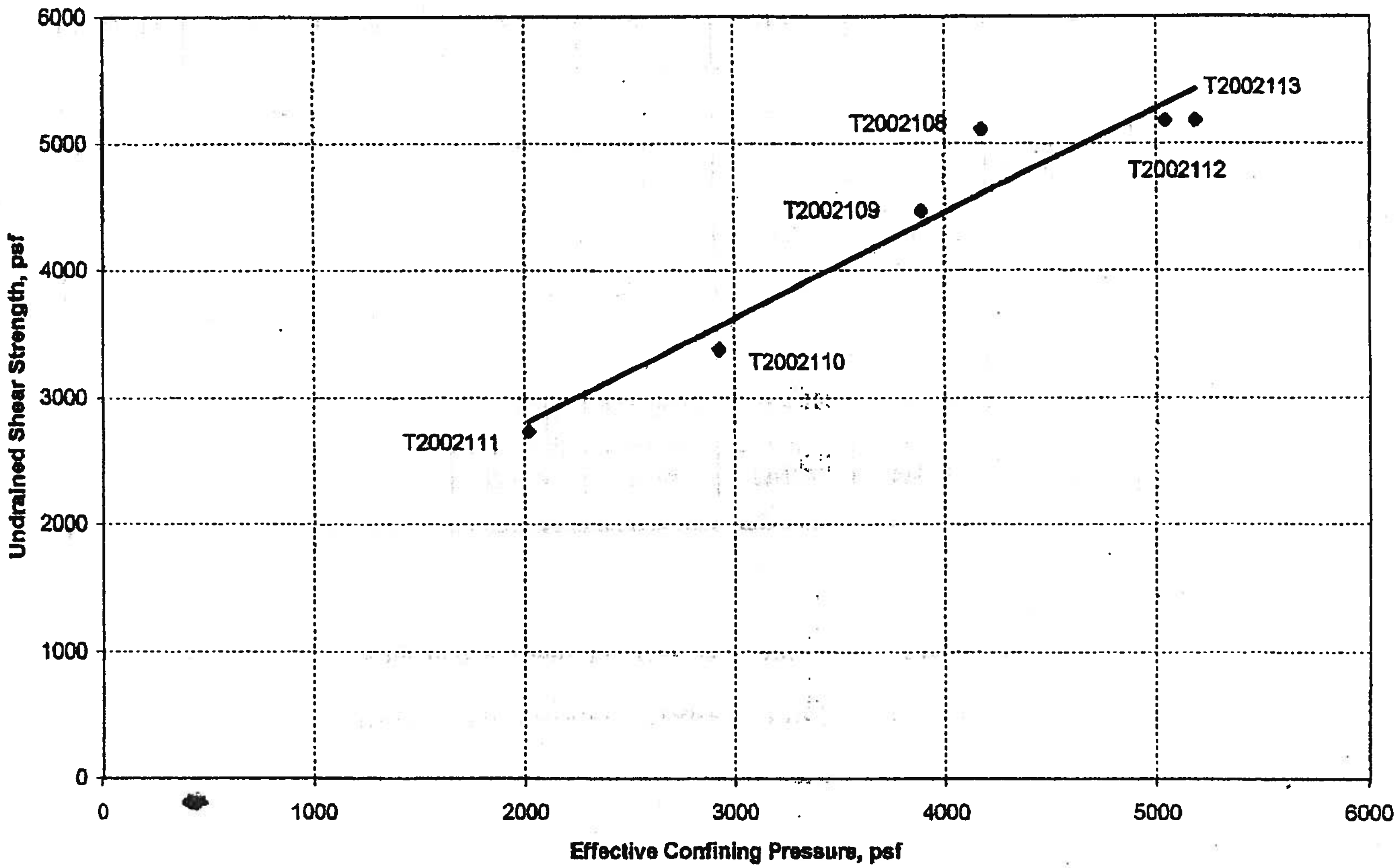


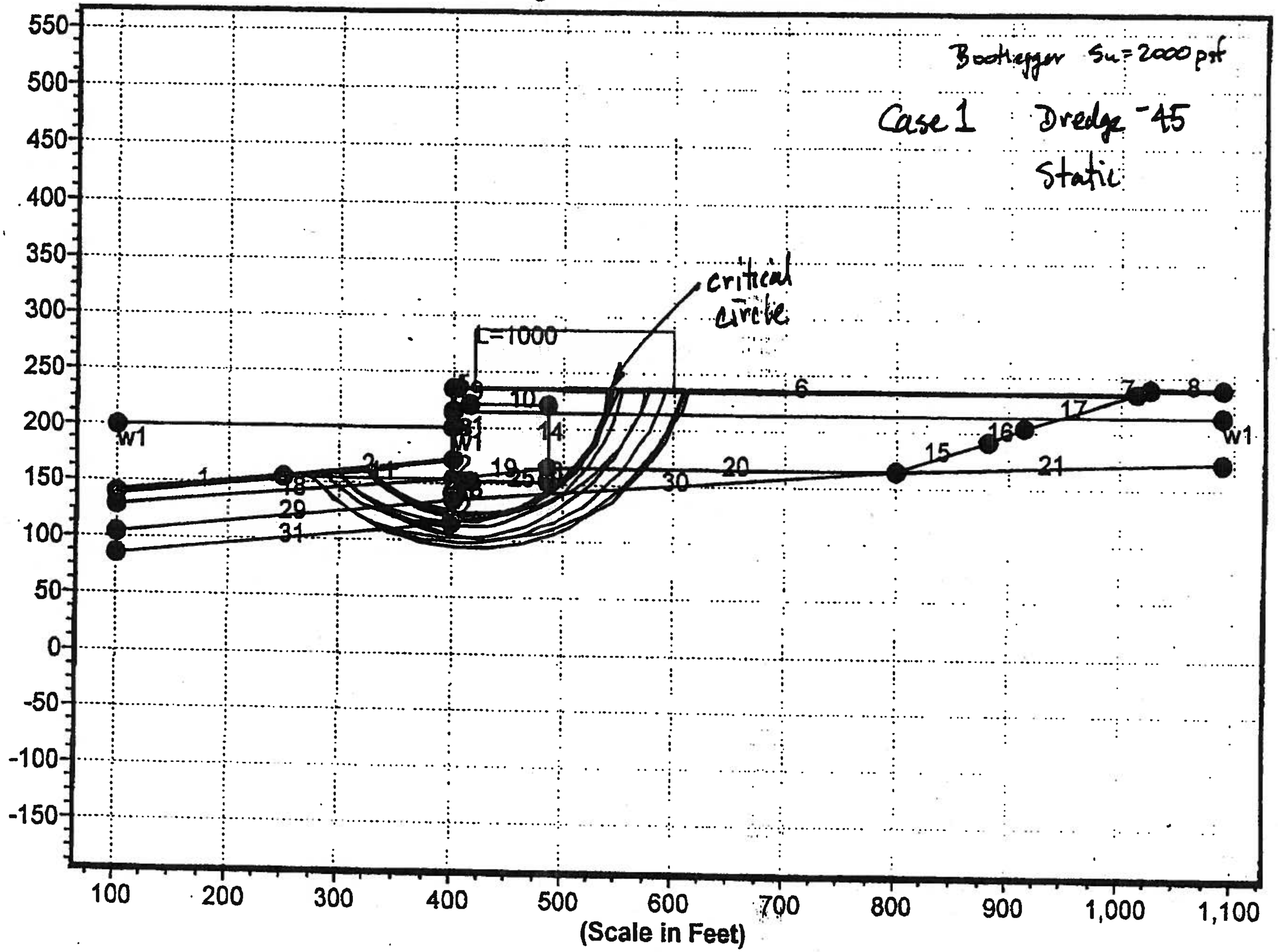
Table 1 - Port of Anchorage - Proposed Expansion - Borehole TH-1

Shear Strength Testing Conditions and Results

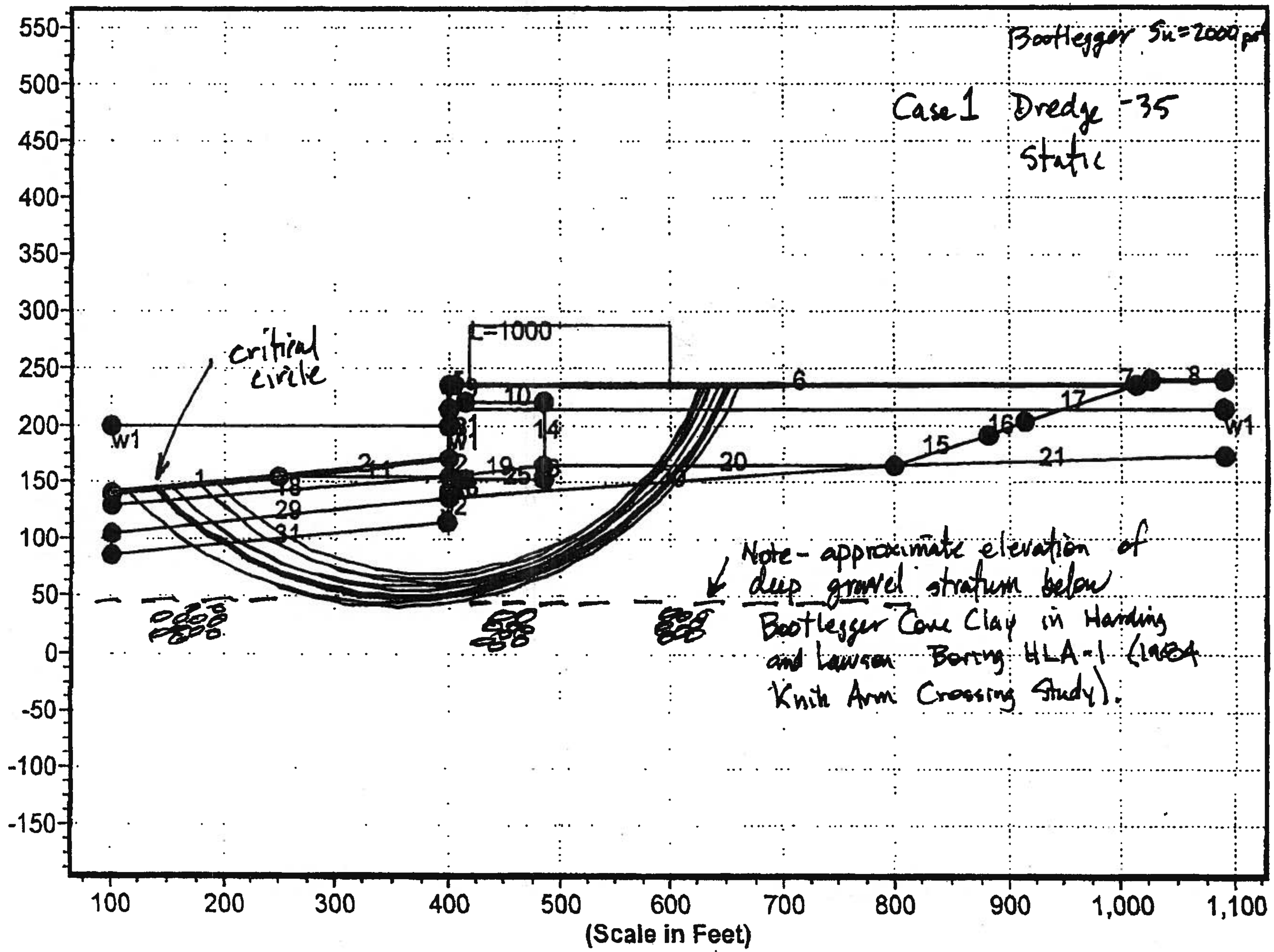
Sample Number	Confining Pressure	Deviator Stress	Total Major Principal Stress	Pore Pressure at Failure	Effective Major Principal Stress	Effective Minor Principal Stress	Undrained Shear Strength	Pore Pressure Parameter, A
	psi	psi	psi	psi	psi	psi	psi	
Consolidated Undrained Triaxial Test								
T2002111	20	38	58	6	52	14	19	0.16
T2002109	40	62	102	13	89	27	31	0.21
T2002108	40	71	111	11	100	29	35.5	0.15
T2002112	60	72	132	25	107	35	36	0.35
T2002113	60	72	132	24	108	36	36	0.33
Unconfined Compression Test								
T2002110	0	47	47	N.A.	N.A.	N.A.	23.5	N.A.

APPENDIX A

Geometry and Boundary Conditions
Problem: Port Anchorage - End Construction - FS Min = 0.987



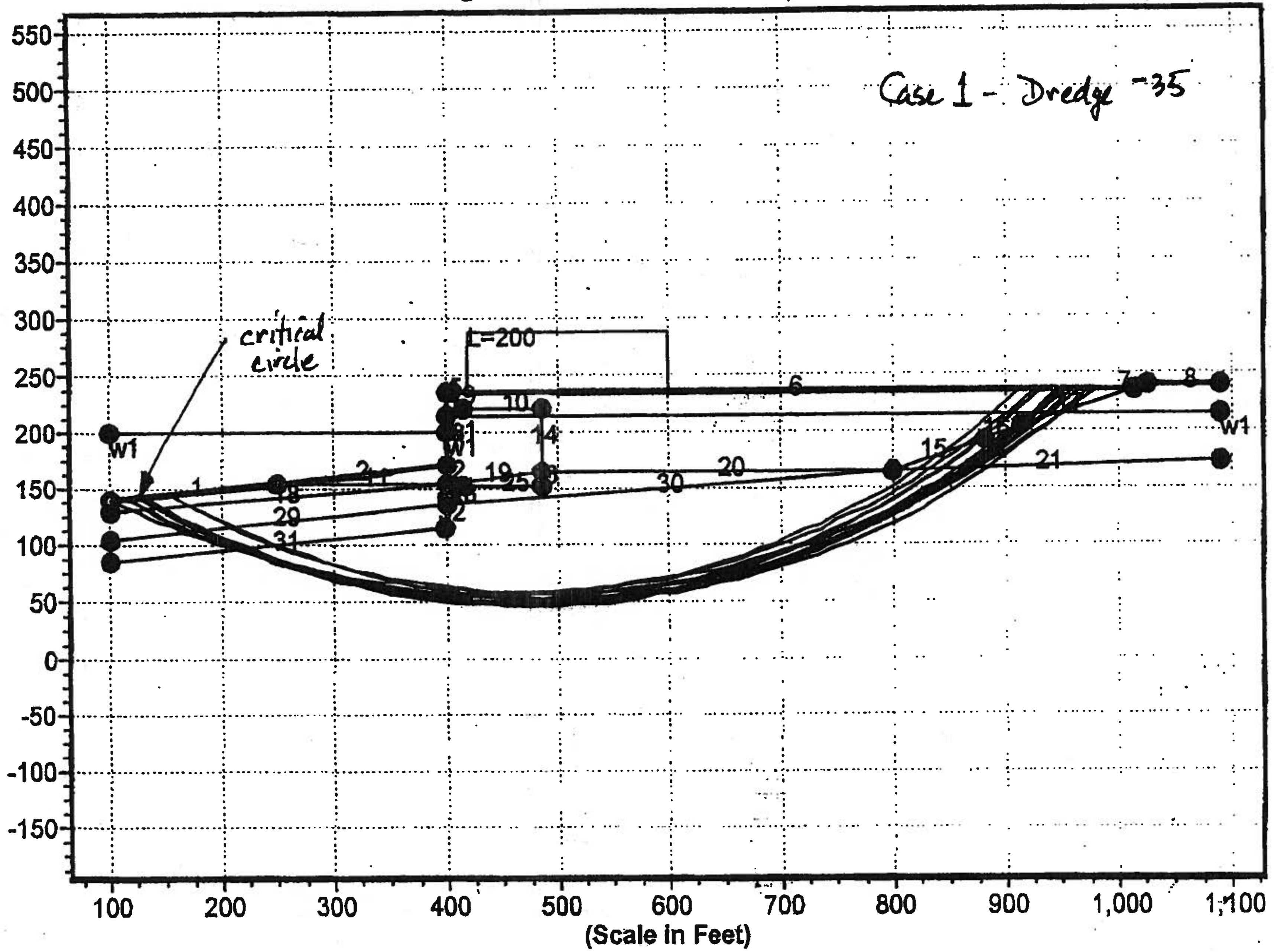
Geometry and Boundary Conditions
Problem: Port Anchorage - End Construction - FS Min = 1.144

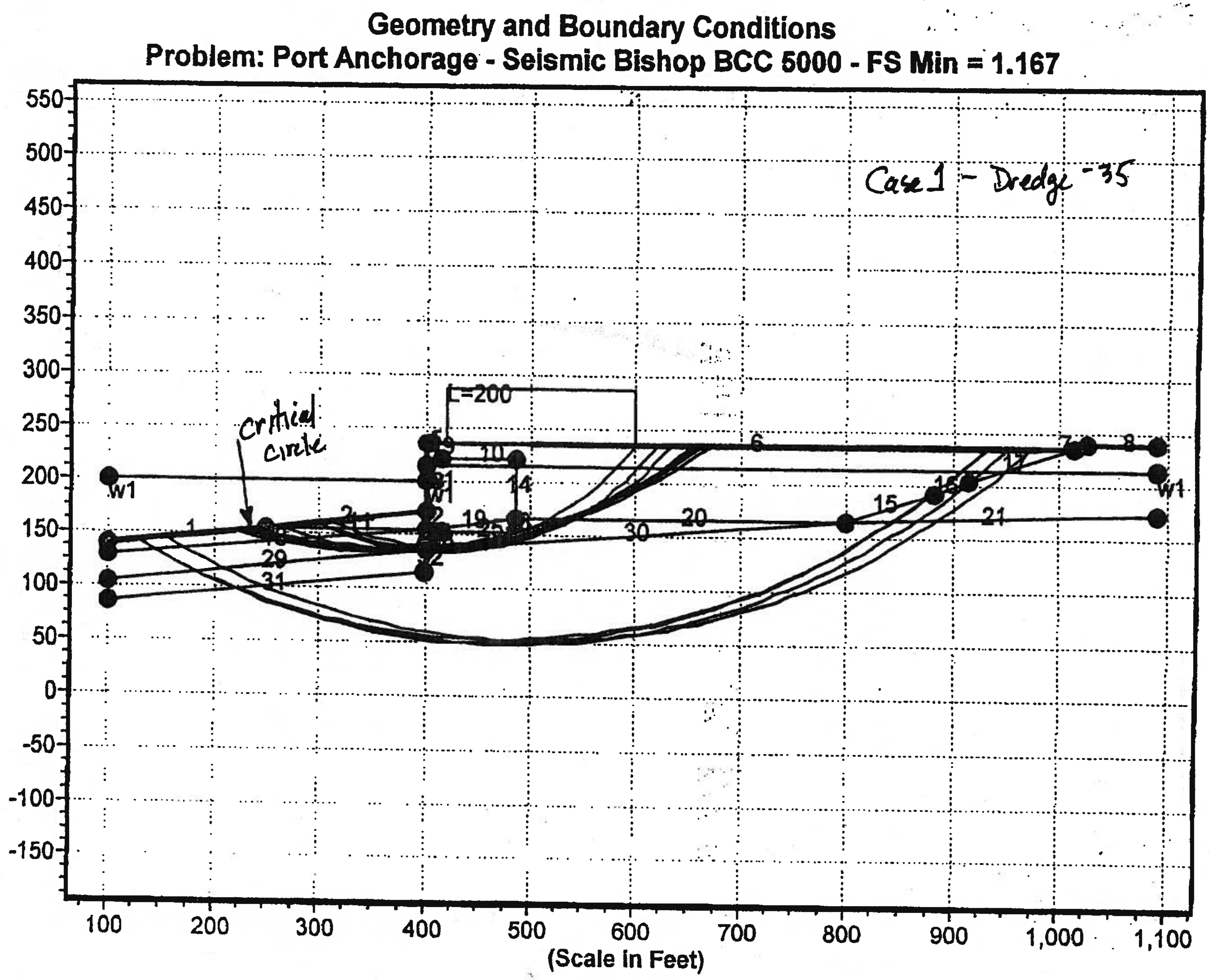


APPENDIX B

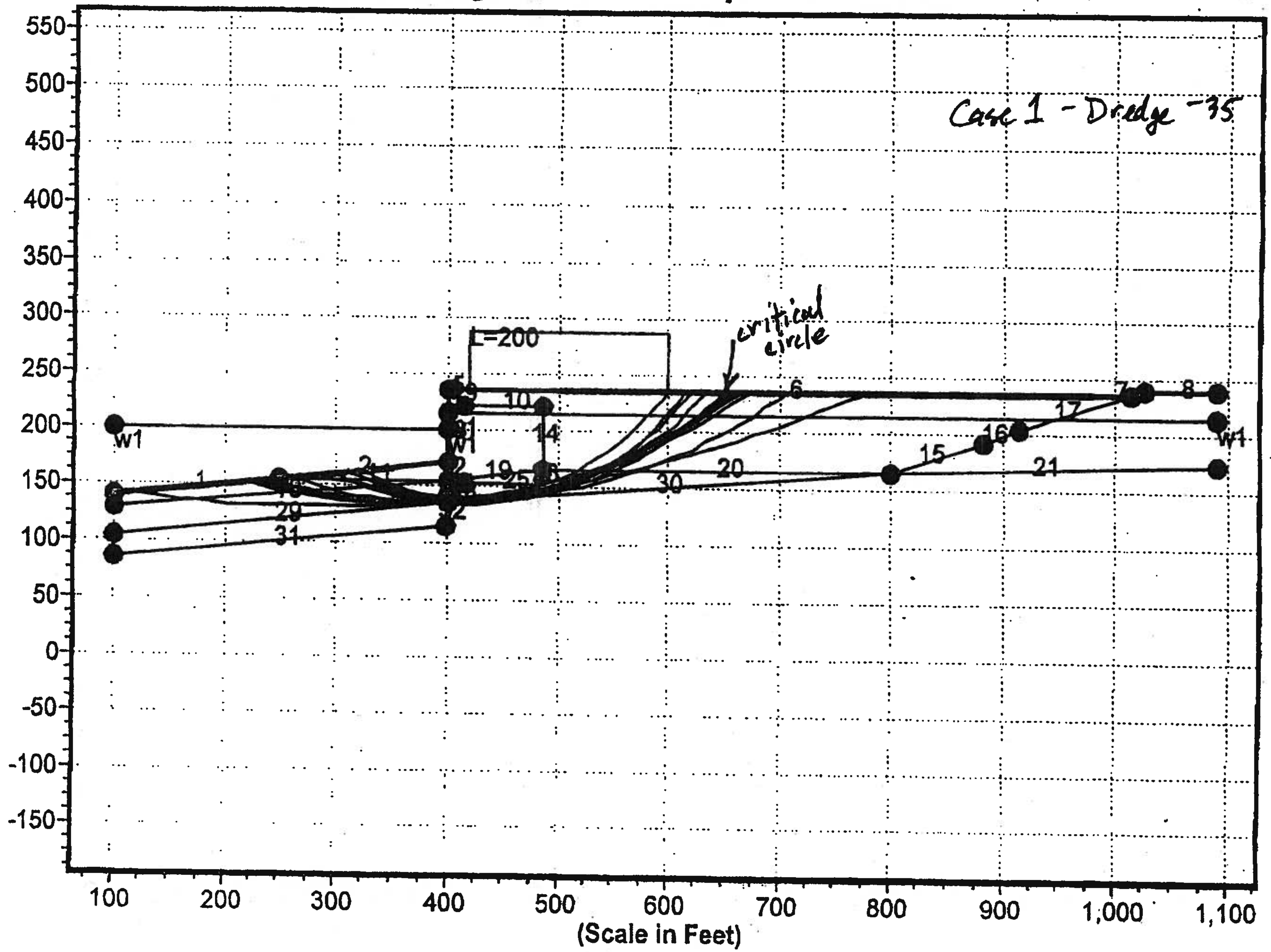
Geometry and Boundary Conditions

Problem: Port Anchorage - Seismic Bishop BCC 4500 - FS Min = 1.081




Geometry and Boundary Conditions
Problem: Port Anchorage - Seismic Bishop BCC 5000 - FS Min = 1.167
Case 1 - Dredge -35
critical circle
L=200
W1
1
2
6
7
8
10
14
15
16
17
19
20
21
29
30
31
550
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
100
200
300
400
500
600
700
800
900
1,000
1,100
(Scale in Feet)

Geometry and Boundary Conditions
Problem: Port Anchorage - Seismic Bishop BCC 6000 - FS Min = 1.167



MUNICIPALITY OF ANCHORAGE

GEOTECHNICAL ADVISORY COMMISSION RESOLUTION NO. 2004-01

A RESOLUTION REGARDING THE PORT OF ANCHORAGE MARINE TERMINAL PROJECT.

(Case GAC 003-03)

WHEREAS, the Geotechnical Advisory Commission has reviewed the draft report by Terracon, "Intermodal Expansion - Port of Anchorage Volume 1," dated December 17, 2003, and discussed its contents with the authors; and,

WHEREAS, the Commission has also reviewed and discussed a letter from the Port of Anchorage dated February 5, 2004, clarifying the intent and use of the Volume 1 report; and,

WHEREAS, the field and laboratory data presented in the report are a significant addition to the public's understanding of variations in the subsurface stratigraphy and behavior of soil in the vicinity of the proposed dock expansion; and,

WHEREAS, the draft report is a work in progress subject to revision; and,

WHEREAS, more stringent design and performance criteria than commonly applied to similar facilities may be appropriate given the very critical role the Port infrastructure will have to Anchorage and the State of Alaska in the event of natural disaster or national emergency; and,

WHEREAS, further engineering analyses will be necessary for determining the final feasibility and design details/configuration of the proposed marine terminal project.

NOW, THEREFORE, BE IT RESOLVED that:

A. The Geotechnical Advisory Commission recommends it be provided the opportunity for continuing involvement in the review process as the marine terminal project concept evolves and is refined.

B. The Geotechnical Advisory Commission recommends future reports and design efforts for the proposed marine terminal address, at a minimum, the following issues:

1. **The rationale for selection of seismic design and performance criteria, especially those differing from local codes or other criteria commonly applied by the Building Official in Anchorage, Alaska, and which shall include convening an independent panel of experts and governing officials to develop consensus criteria.**
2. **Site specific seismic response and impacts on design criteria.**
3. **Independent third party peer review of technical aspects of the work, such as the stability of design options and impacts of variations in material properties found within the dock expansion area.**

PASSED AND APPROVED by the Municipal Geotechnical Advisory Commission on this 30th day of March 2004.

Donald S. Alspach
Secretary

John L. Aho
Chair

EXHIBIT Q

Municipality of Anchorage

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Office of Economic and Community Development

Major Mark Begich

**A RESOLUTION RECOMMENDING
DESIGN APPROACH AND SEISMIC PARAMETER SELECTION
FOR
THE PORT OF ANCHORAGE
INTERMODAL EXPANSION PROJECT.**

WHEREAS, the Port of Anchorage serves 80% of the geographic area of the state and supplies Alaska with 90% of its consumer goods; and

WHEREAS, the Port of Anchorage is a lifeline port for the Municipality of Anchorage as well as the rest of the State; and

WHEREAS, independent studies conducted in 1999 established the Port's contribution to Alaska's economic activity as more than $725 million annually, and

WHEREAS, the cargo tonnage throughput at the Port of Anchorage has increased more than 34% since that economic figure was establish; and

WHEREAS, major portions of the Port of Anchorage terminal were completed in 1961; and

WHEREAS, the seismic event of March 27, 1964 destroyed the Southcentral Alaska cargo ports at Seward, Valdez and Whittier; and

WHEREAS, the Port of Anchorage marine terminal survived the event with relatively minor damage and was returned to operations immediately; and

WHEREAS, the vast majority of supplies and equipment necessary to re-build the communities of Southcentral Alaska following the earthquake were shipped through the Port of Anchorage; and

WHEREAS, those historic events established the Port of Anchorage as the dominant general marine cargo terminal in the State; and

WHEREAS, the Anchorage Geotechnical Advisory Commission has recognized the importance of the Port of Anchorage to the economic and social well-being of the residents of the Municipality of Anchorage in the event of a natural disaster or national emergency; and

WHEREAS, the Anchorage Geotechnical Advisory Commission has further recommended that an independent panel of experts and governing officials develop consensus criteria for seismic design standards for the Port of Anchorage Intermodal Expansion Project;

NOW, THEREFORE BE IT RESOLVED, that the Port of Anchorage Seismic Design Committee, appointed by Mayor Mark Begich, hereby recommends the following multi-level seismic design approach for the waterfront components of the Port of Anchorage in light of risks, costs and benefits to the Municipality of Anchorage;

A two-level seismic design approach is required as follows:

LEVEL 1: Under the first level of design, Operating Level Earthquake (OLE) ground motions are established that, at a minimum, have a 50-percent probability of exceedance in 50 years (corresponding to an average return period of 72 years). Under this level of shaking, the structure shall be designed so that operations are not interrupted and any damage that does occur will be repairable in a short time.

LEVEL 2: Under this second level of design, more severe Contingency Level Earthquake (CLE) ground motions are established that, at a minimum, have a 10-percent probability of being exceeded in 50 years (corresponding to an average return period of 475 years). Under this level of shaking, the structure shall be designed so as to undergo damage that is controlled, economically repairable, and is not a threat to life or safety.

BE IT FURTHER RESOLVED that the Committee recommends that the Port Expansion Team continues to examine and evaluate the physical and economic feasibility of designing, at a minimum, one berth to withstand a seismic event greater in scope than a Level 2 Contingency Level Earthquake in order to provide an emergency point of entry for goods and supplies necessary to support the community. Said evaluation should consider cost and risk implications of such a design.

PASSED AND APPROVED by the Port of Anchorage Seismic Design Committee, this 29th day of June, 2004.

Mary Jane Michael, Chair

And members of the committee:

Gov. Bill Sheffield, Director of the Port of Anchorage
Mr. Howard Holtan, P.E., Municipal Engineer
Mr. Mark Musial, P.E., Consulting Geotechnical Engineer
Mr. Stuart Werner, P.E., Consulting Earthquake Engineer
Youssef Hashash, Ph.D., Assistant Professor of Civil Engineering, University of Illinois (Consulting member/non-voting)

Municipality of Anchorage

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Mayor Mark Begich

Planning Department

GEOTECHNICAL ADVISORY COMMISSION

August 15, 2005

The Honorable William J. Sheffield
Director, Port of Anchorage
Municipality of Anchorage
2000 Anchorage Port Road
Anchorage, AK 99501

RE: June 2005 Briefing on Port Expansion Status to Geotechnical Advisory Commission and Clarification of GAC Resolution 2004-01

Dear Mr. Sheffield:

Thank you for arranging the update for the MOA Geotechnical Advisory Commission (GAC) on June 23, 2005. The Commission especially appreciates the effort and expense incurred by the Port to bring key members of the team to Anchorage to explain the work completed since our last meeting.

This Port Expansion Project will undergo review by the Building Safety Division of the Development Services Department and likely the Geotechnical Advisory Commission. During these reviews the assessment of the community risk, code compliance, and seismic design criteria will be addressed. The Commission believes that addressing these issues before the Municipality proceeds with the design-build contract will save the project time and money. Consequently, the Commission previously submitted GAC Resolution No. 2004-01 (attached) to advise the Port of significant considerations for the project.

The Commission met following the June briefing to discuss the information presented about geotechnical aspects of the Port Expansion and the intent of the Resolution. The Commission believes that Resolution Items B.1. and B.3. have not been fully addressed and offers the following comments to help clarify its position on these issues and assure that the design criteria used, structural systems selected, and the portions of the Port where various criteria are applied have been developed in a rational and well-documented manner that can also stand public and agency scrutiny.

<u>GAC Resolution Item B.1.</u> – "*The rationale for selection of seismic design and performance criteria, especially those differing from local codes or other criteria commonly applied by the Building Official in Anchorage, Alaska, and which shall include convening an independent panel of experts and governing officials to develop consensus criteria.*"

While the Commission appreciates the outcome of the meeting by the Port of Anchorage Seismic Design Committee in June 2004 and its effort in setting a basic framework for seismic design and performance criteria, the Commission views that meeting as a start to a continuing process in which these criteria are further refined. The Committee's resolution (see attached) does not provide sufficient information to understand the rationale for accepting the criteria, especially given the key role the Port will have in protecting the health and safety of Alaskans if a significant natural disaster occurs.

Given the importance of the Port to statewide commerce, life-safety in the event of a natural disaster, and it's designation as a Strategic Port, the Commission believes that it should be considered an "Essential Facility" as defined in Section 1602.1 of the International Building Code (IBC), which is the applicable code in the MOA. The Commission also believes that some portions of the dock and associated structures should be classified as Category III according to Table 1604.5 of the IBC. The Commission anticipates that the Essential Facility and Category III designations will result in seismic input that is larger than applied to ordinary structures in similar parts of Anchorage, which will impact the outcome of stability and soil-structure interaction analyses and result in applicable portions of the facility being built to a higher-than-normal design criteria.

Essential Facilities typically have a larger potential impact to the public than other facilities with lesser potential impact; consequently they receive more investment to mitigate the risks. The impact to Alaskans if the Port and associated transportation links does not perform well during a natural disaster such as a major earthquake is very large. Hence, it is justified to consider a broader look at the risk and potential mitigation efforts than that offered by the Committee in their resolution. For example, there is no explanation as to how having only one section of the expansion built to remain operational following an extreme seismic event will meet the projected needs of the Municipality or those in the rest of the State.

The Commission recommends that further analysis be completed to refine the understanding of project risk as it relates to natural disasters such as a large Megathrust earthquake. At a minimum, development of consensus criteria for the Port Expansion project should include a qualitative risk assessment process. This effort should be moderated by an independent professional who is experienced with risk assessments and has a record of successfully developing consensus with diverse groups. Input should be solicited from a number of sources, including but not limited to the following:

- State and Municipal Emergency Services personnel who understand community needs in a disaster and the distribution systems that are necessary to move relief supplies from the Port to those who need it;

- Local building officials who work with implementation of the local building code and who are responsible for understanding how the proposed project varies from code;
- The MOA Geotechnical Advisory Commission;
- Representatives from another port such as the Los Angeles area where similar development issues have had to be addressed; and
- Representatives of other affected stakeholders such as the Alaska Railroad, tank farm operators, food distributors, and the military.

The outcome of the risk assessment should be a report documenting who was involved, risk scenarios considered, and where the scenarios fall with regard to Port performance and seismic design level. An example of this type of effort was the work the Municipality commissioned to evaluate fire hazards posed by tank farm operations adjacent to the Government Hill neighborhood.

Given the importance of the Port and the role it is likely to play in the event of a natural disaster, it is incumbent upon the Municipality as owner and operator to assure that performance of the facility will meet the needs of the public. The one tool available to do this is through appropriate design criteria. The decision regarding which design criteria to use or how it is to be applied cannot reasonably be left to prospective design-build contractors, and it should not be the sole responsibility of the Port's design team.

GAC Resolution Item B.3. - "*Independent third party peer review of the technical aspects of the work, such as the stability of design options and impacts of variations in material properties found within the dock expansion area.*"

Several aspects of the proposed development involve state of the art geotechnical and structural engineering. Although the Commission recognizes the expertise of the technical advisory group working with the design team, an independent third party peer review of technical aspects of a major project remains a prudent approach and one that has been frequently used on other projects. For example, the Commission has significant questions as to the validity of the assumptions used in the FLAC analyses for the open cell sheet pile structures that could best be addressed by such a panel.

Additionally, for the state-of-the art analyses, existing structural systems similar to those proposed for the Port expansion should be reviewed to assess structural redundancy, previous failures, and applicability to the proposed modeling effort. As an example, there are other known failures and successes of open-cell sheet walls in Alaska that are not included in the latest Port documentation. This assessment would provide valuable data for understanding and interpreting the modeling results, the risk analyses, and the engineering components of the Port Expansion project.

The peer review group should include those from academia as well as engineering practitioners with relevant modeling and design experience. The Commission would be happy to suggest names or assist the Port in evaluating qualifications for a peer review panel.

Thank you again for the opportunity to further review the work being undertaken for the Port Expansion project. Given the schedule for this project, the Commission would be happy to arrange special meetings as needed to resolve the above concerns in a timely manner. We look forward to further periodic updates and providing assistance to the Municipality in addressing geotechnical design criteria for this very important project.

Sincerely,

MUNICIPALITY OF ANCHORAGE
GEOTECHNICAL ADVISORY COMMISSION

Mark R. Musial, P.E.
Chair

Attachments: GAC Resolution 2004-01
Port of Anchorage Seismic Design Committee Resolution of June 29, 2004

cc: Kevin Bruce, Deputy Port Director
Mary Jane Michael, Executive Director, Office of Economic and Community Development
Howard Holtan, Municipal Engineer, Project Management and Engineering Department
Mr. Stuart Werner, P.E.
Mr. Youssef Hashash, PhD, University of Illinois
Ron Thompson, Director/Building Official, Development Services Department
Tom Nelson, Director, Planning Department
Ron Wilde, Plan Review Engineer, Building Safety Division, Development Services Department

MUNICIPALITY OF ANCHORAGE

GEOTECHNICAL ADVISORY COMMISSION RESOLUTION NO. 2004-01

A RESOLUTION REGARDING THE PORT OF ANCHORAGE MARINE TERMINAL PROJECT.

(Case GAC 003-03)

WHEREAS, the Geotechnical Advisory Commission has reviewed the draft report by Terracon, "Intermodal Expansion - Port of Anchorage Volume 1," dated December 17, 2003, and discussed its contents with the authors; and,

WHEREAS, the Commission has also reviewed and discussed a letter from the Port of Anchorage dated February 5, 2004, clarifying the intent and use of the Volume 1 report; and,

WHEREAS, the field and laboratory data presented in the report are a significant addition to the public's understanding of variations in the subsurface stratigraphy and behavior of soil in the vicinity of the proposed dock expansion; and,

WHEREAS, the draft report is a work in progress subject to revision; and,

WHEREAS, more stringent design and performance criteria than commonly applied to similar facilities may be appropriate given the very critical role the Port infrastructure will have to Anchorage and the State of Alaska in the event of natural disaster or national emergency; and,

WHEREAS, further engineering analyses will be necessary for determining the final feasibility and design details/configuration of the proposed marine terminal project.

NOW, THEREFORE, BE IT RESOLVED that:

A. The Geotechnical Advisory Commission recommends it be provided the opportunity for continuing involvement in the review process as the marine terminal project concept evolves and is refined.

B. The Geotechnical Advisory Commission recommends future reports and design efforts for the proposed marine terminal address, at a minimum, the following issues:

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2. Site specific seismic response and impacts on design criteria.
3. Independent third party peer review of technical aspects of the work, such as the stability of design options and impacts of variations in material properties found within the dock expansion area.

PASSED AND APPROVED by the Municipal Geotechnical Advisory Commission on this 30th day of March 2004.

Donald S. Alspach
Secretary

John L. Aho
Chair

Municipality of Anchorage

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Office of Economic and Community Development

Mayor Mark Begich

A RESOLUTION RECOMMENDING DESIGN APPROACH AND SEISMIC PARAMETER SELECTION FOR THE PORT OF ANCHORAGE INTERMODAL EXPANSION PROJECT.

WHEREAS, the Port of Anchorage serves 80% of the geographic area of the state and supplies Alaska with 90% of its consumer goods; and

WHEREAS, the Port of Anchorage is a lifeline port for the Municipality of Anchorage as well as the rest of the State; and

WHEREAS, independent studies conducted in 1999 established the Port's contribution to Alaska's economic activity as more than $725 million annually, and

WHEREAS, the cargo tonnage throughput at the Port of Anchorage has increased more than 34% since that economic figure was establish; and

WHEREAS, major portions of the Port of Anchorage terminal were completed in 1961; and

WHEREAS, the seismic event of March 27, 1964 destroyed the Southcentral Alaska cargo ports at Seward, Valdez and Whittier; and

WHEREAS, the Port of Anchorage marine terminal survived the event with relatively minor damage and was returned to operations immediately; and

WHEREAS, the vast majority of supplies and equipment necessary to re-build the communities of Southcentral Alaska following the earthquake were shipped through the Port of Anchorage; and

WHEREAS, those historic events established the Port of Anchorage as the dominant general marine cargo terminal in the State; and

WHEREAS, the Anchorage Geotechnical Advisory Commission has recognized the importance of the Port of Anchorage to the economic and social well-being of the residents of the Municipality of Anchorage in the event of a natural disaster or national emergency; and

WHEREAS, the Anchorage Geotechnical Advisory Commission has further recommended that an independent panel of experts and governing officials develop consensus criteria for seismic design standards for the Port of Anchorage Intermodal Expansion Project;

NOW, THEREFORE BE IT RESOLVED, that the Port of Anchorage Seismic Design Committee, appointed by Mayor Mark Begich, hereby recommends the following multi-level seismic design approach for the waterfront components of the Port of Anchorage in light of risks, costs and benefits to the Municipality of Anchorage;

A two-level seismic design approach is required as follows:

LEVEL 1: Under the first level of design, Operating Level Earthquake (OLE) ground motions are established that, at a minimum, have a 50-percent probability of exceedance in 50 years (corresponding to an average return period of 72 years). Under this level of shaking, the structure shall be designed so that operations are not interrupted and any damage that does occur will be repairable in a short time.

LEVEL 2: Under this second level of design, more severe Contingency Level Earthquake (CLE) ground motions are established that, at a minimum, have a 10-percent probability of being exceeded in 50 years (corresponding to an average return period of 475 years). Under this level of shaking, the structure shall be designed so as to undergo damage that is controlled, economically repairable, and is not a threat to life or safety.

BE IT FURTHER RESOLVED that the Committee recommends that the Port Expansion Team continues to examine and evaluate the physical and economic feasibility of designing, at a minimum, one berth to withstand a seismic event greater in scope than a Level 2 Contingency Level Earthquake in order to provide an emergency point of entry for goods and supplies necessary to support the community. Said evaluation should consider cost and risk implications of such a design.

PASSED AND APPROVED by the Port of Anchorage Seismic Design Committee, this 29th day of June, 2004.

Mary Jane Michael, Chair

And members of the committee:

Gov. Bill Sheffield, Director of the Port of Anchorage
Mr. Howard Holtan, P.E., Municipal Engineer
Mr. Mark Musial, P.E., Consulting Geotechnical Engineer
Mr. Stuart Werner, P.E., Consulting Earthquake Engineer
Youssef Hashash, Ph.D., Assistant Professor of Civil Engineering, University of Illinois (Consulting member/non-voting)

GEOTECHNICAL PROCESS
Port of Anchorage Intermodal Expansion Project
March, 2006

The purpose of this summary is to provide clarification regarding the process surrounding the geotechnical analysis and review performed for the Port of Anchorage Expansion Project. This summary describes the process and organization for the geotechnical feasibility studies performed to date. An overall geotechnical summary presented to the Mayor's Independent Port of Anchorage Seismic Design Committee (Blue Ribbon Panel) is attached that outlines the key geotechnical analysis accomplished up through June of 2004. Further analysis and review will continue through the design phase of the project.

The Port of Anchorage is undergoing a major expansion by the USDOT Maritime Administration (MARAD). The site of the project is situated on the Bootlegger Cove Formation, which historically experienced slope stability failures within exposed bluffs during seismic events. Prior to the MARAD geotechnical investigations, studies of this formation focused on exposed bluff material. Previous offshore geotechnical reports were based upon assumptions, not data, and did not apply to the submarine environment at the Port of Anchorage. The extensive scientific analysis conducted on behalf of MARAD, demonstrates that the submarine Bootlegger Cove Formation behaves differently than the exposed surface (i.e. the submarine formation gains strength with depth).

Out of concerns raised about the local Bootlegger Cove Formation and the potential for large seismic events at the proposed Port site, MARAD performed significant geotechnical feasibility beginning with an offshore drilling program specifically designed to collect scientific subsurface information. Data from the drilling was used for global and internal stability analysis. Based upon that information, it was determined that the particular formation found below the Port would be stable and both the open cell sheet pile bulkhead and pile supported design structures would withstand significant seismic events.

During MARAD's studies of seismic events, an open cell sheet pile structure performed equal to or better than other design alternatives. The open cell structure exhibits global stability similar to a pile supported deck structure. The open cell sheet piles were found to have the internal stability needed under required seismic loading and within design interlock stress limits as defined by the manufacturer. The deflections and settlements were found to be within tolerances. A pile supported deck concept is stable under the probable seismic events, although not as stable as the open cell sheet pile concept under higher seismic loadings equivalent to the 1964 earthquake. Based on seismic performance, cost, and constructability perspectives, MARAD selected the open cell sheet pile structure as the preferred alternative for the Port of Anchorage expansion.

Portions of the offshore site exhibit weak zones below the surface. The weak zones are being evaluated to design controls to improve strength. State-of-the-art computer modeling using finite-difference-methods allowing elastic response are currently being used to refine and optimize the structural design. More geotechnical analysis will be performed for the waterfront structures once the design of the structure begins. The structure will also be instrumented to validate certain design assumptions to allow design changes as deemed necessary through project development.

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DEFINITIONS:

Advisory Committee: Independent geotechnical academia retained by MARAD to review the Terracon geotechnical feasibility program to validate assumptions and make recommendations.

Anchorage Port Expansion Team: MARAD, Municipality of Anchorage/Port of Anchorage, Integrated Concepts & Research Corporation (federal contractor to MARAD).

Bootlegger Cove Formation: Well-stratified layers of glaciomarine and glaciolacustrine silty clay, clayey silt, silty fine sand, and scattered coarse-grained sediment. This formation represents the majority of the soils present at the project site, which directly influences the stability of the POA structures. The silt and clay of the formation in the project area is over consolidated, has low to moderate plasticity, and exhibits a uniform to increasing shear strength with depth.

DEEPSOIL: DEEPSOIL is a one-dimensional site response analysis software program that can perform both a) 1-D nonlinear and b) 1-D equivalent linear analyses.

FLAC (also known as 2D FLAC): Fast Lagrangian Analysis of Continua (*FLAC*) analysis to predict deflections and strains within various structures being considered at the site. *FLAC* is a powerful two-dimensional continuum code developed in 1986 for modeling soil, rock, and structural behavior. *FLAC* is a general analysis and design tool for geotechnical, civil, and mining engineers that can be applied to a broad range of problems in engineering studies. The explicit finite difference formulation of the code makes *FLAC* ideally suited for modeling geo-mechanical problems that consist of several stages, such as sequential excavation, backfilling, and loading. The formulation can accommodate large displacements and strains and non-linear material behavior, even if yield or failure occurs over a large area or if total collapse occurs.

***FLAC3D*:** A numerical modeling code for advanced geotechnical analysis of soil, rock, and structural support in three dimensions. *FLAC3D* is used in analysis, testing, and design by geotechnical, civil, and mining engineers. It is designed to accommodate any kind of geotechnical engineering project where continuum analysis is necessary. *FLAC3D* utilizes an explicit finite difference formulation that can model complex behaviors not readily suited to finite element method codes, such as: problems that consist of several stages, large displacements and strains, non-linear material behavior, and unstable systems (even cases of yield/failure over large areas or total collapse).

Global stability: The analysis of the earth masses acted upon by gravity, water and major forces such as earthquakes. It is measured by calculating a safety factor when comparing the soil strength with the forces tending to cause movement or failure of a slope.

Internal stability: The analysis of the soil and the structure interaction by calculating the performance of the structure. It is measured by stresses and deflections of the structure compared with the strength of the materials and the ability to perform the intended functions. This is often referred to as a performance based analysis.

MARAD: United States Department of Transportation Maritime Administration; lead agency for the Port of Anchorage Intermodal Expansion project.

Port of Anchorage Seismic Design Committee (Mayoral Blue Ribbon Panel): An independent panel of experts and governing officials appointed by the Mayor to develop consensus criteria for seismic design standards for the Port of Anchorage Intermodal Expansion.

Terracon: An established national geotechnical consulting and engineering team retained by MARAD to lead the geotechnical feasibility program for the Port expansion project.

GEOTECHNICAL PROCESS
Port of Anchorage Intermodal Expansion Project
March, 2006

MARAD'S GEOTECHNICAL CONSULTANT

The attached organizational chart depicts the relationships between the entities hired by MARAD for the Port of Anchorage Expansion and particularly for the geotechnical work. Relationships with the Municipality of Anchorage, the Port of Anchorage, the Municipality's Geotechnical Advisory Committee and the Blue Ribbon Panel are also highlighted. As the chart reflects, MARAD retained Integrated Concepts & Research Company (ICRC) to act as the Program Manager for the Expansion; ICRC was and is not the geotechnical expert of the project. Instead, MARAD enlisted a well established national geotechnical consulting engineering team, Terracon Consulting Engineers, Inc. (Terracon), to lead the geotechnical feasibility program. Terracon has provided quality and ethical services since 1965 and operates 80 offices in 25 states. In that capacity, Terracon has: (1) thoroughly reviewed existing baseline geotechnical data for the project site; (2) tightly managed a controlled collection of scientific data through an extensive off-shore drilling program; (3) provided extensive data analysis; (4) developed site specific seismic studies; (5) conducted global stability analysis; (6) conducted internal stability analysis; and (7) performed Fast Lagrangian Analysis of Continua (*FLAC*) analysis to predict deflections and strains within various structures being considered at the site.

Terracon collected scientific data at the Port of Anchorage harbor from the submarine formation to enable site-specific modeling efforts. All previous reports concerning the proposed new Port facility used either extrapolated data or estimated subsurface conditions for the submarine Bootlegger Cove Formation; however, at the time, little was known about the actual conditions at the Port site. To collect actual site specific data, Terracon undertook the site investigation using a stable drilling platform called a jack-up rig to collect samples (such a rig was needed because of the strong current and tidal fluctuations). Under expert supervision, the drilling program used state-of-the-art methods and equipment to capture the subsurface information.

Twenty soil test borings were drilled and thirty-eight Cone Penetrometer tests (CPTu) were performed from this offshore jack-up platform for the subsurface exploration. Each test site was drilled to depths ranging from 150 to 210 feet below the mud-line. The test locations were generally located along two lines parallel to the existing wharf, at about 200 feet and 400 feet seaward from the wharf in areas where the future structure would be located.

INDEPENDENT ADVISORY COMMITTEE

An Advisory Committee (see attached organizational chart) of independent geotechnical experts was retained by ICRC to review the Terracon program: Dr. Paul Mayne (Professor of Geotechnical Engineering, Georgia Institute of Technology); Dr. Peter Robertson (Professor and Associate Dean of Civil Engineering, University of Alberta); and Dr. Youseff Hashash (Associate Professor of Civil Engineering at the University of Illinois). The resumes and qualifications for these Advisory Committee individuals are attached. This impartial Advisory Committee reviewed the geotechnical program at the following critical junctures:

- **Prior to implementation of field data collection program.** **The Advisory Committee recommended Terracon alter the field program to include specific types of data collection with samples secured for laboratory testing. The Advisory Committee also recommended the program include additional in-situ tests, including down-hole shear wave velocity tests, pore pressure dissipation tests, and in-situ shear strength methods.**

  Terracon included these recommendations for additional tests into the program.

- **<u>Prior to implementation of the laboratory testing program.</u> The Advisory Committee recommended the types of laboratory tests to determine specifically the pre-consolidation pressure in the Bootlegger Cove Formation (e.g. consolidated undrained triaxial compression parameters, direct simple shear consolidated undrained tests required, and all one-dimensional consolidated tests required). The Advisory Committee also recommended the laboratory analysis follow procedures recommended by Charles C. Ladd, Professor Emeritus, Massachusetts Institute of Technology (MIT) as presented at the 22nd Annual ASCE Terzhagi Lecture: "Stability Evaluation during Staged Construction."**

  Terracon adopted these recommendations.

- **<u>Start up of the modeling effort.</u> A third meeting was held with the Advisory Committee in September 2003 to establish the overall parameters for the preliminary analysis of various design alternatives.**

  Terracon performed geotechnical analysis using these parameters for alternative concepts including marginal wharfs, pile supported decks with sloping rock-fill, cofferdam options, open cell sheet piles, and gravity structures. Surcharge loadings and the suggested loading distributions for the cranes and other equipment on the piers were incorporated into the geotechnical modeling effort.

- **<u>Development of site specific seismic analysis.</u> The Advisory Committee recommended a comprehensive study of the soil-structure interaction based upon findings at the Port using the DEEPSOIL modeling program. The University of Illinois performed an independent DEEPSOIL analysis under the direction of Dr. Hashash.**

  Terracon incorporated the results, including the synthetic waveforms for various seismic events into the on-going geotechnical program.

- **Multiple subsequent meetings occurred between Terracon and Drs. Mayne, Hashash, and Robertson to allow information exchange and consultation to the geotechnical program. Dr. Robertson independently analyzed the raw data to determine the conditions pertaining to the liquefaction potential. Dr. Mayne independently analyzed all of the laboratory and field in-situ data to recommend parameters for both the Bootlegger Cove Formation and non-cohesive soil layers.**

  Terracon followed the recommendations of these experts.

GEOTECHNICAL CONSULTANTS ON-GOING AND FUTURE WORK

The 2D *FLAC* modeling effort performed by Terracon provided two-dimensional finite difference analysis to estimate slope and/or structural movements due to construction activities or seismic shaking. This model simulates the behavior of soil, rock, and structural members to evaluate the static or seismic performance of the model. Displacement-based modeling complements slope stability modeling because it calculates displacements rather than a factor of safety. While a factor of safety provides a general index of stability, it does not correlate well to how much a slope may move. *FLAC* allows the engineer and owner to understand the consequence of construction activity and/or seismic shaking by predicting the displacements throughout the model to determine if the facility will remain serviceable.

Advanced three-dimensional continuum modeling is now underway by the Terracon team. *FLAC3D* is a numerical modeling code for advanced geotechnical analysis of soil, rock, and structural support in three dimensions. *FLAC3D* is used in analysis, testing, and design by geotechnical, civil, and mining engineers. It is designed to accommodate any kind of geotechnical engineering project where continuum analysis is necessary. *FLAC3D* uses an explicit finite difference formulation that can model complex behaviors not readily suited to finite element method codes, such as: problems that consist of several stages, large displacements and strains, non-linear material behavior, and unstable systems (even cases of yield/failure over large areas or total collapse).

Further, as the project proceeds, Terracon will also instrument the structure designed by the marine engineering team in order to validate all future design assumptions, including pore pressure measurements, deflections, and seismic response.

FUTURE DESIGN TEAM

Upon issuance of Army Corps of Engineer's permits, MARAD and ICRC will procure a separate design team as indicated in the attached organizational chart. This team is responsible for the future structural and geotechnical design effort. MARAD requires this future team of engineering professionals to independently re-evaluate Terracon modeling efforts performed to date. The future design effort will require additional geotechnical global stability, internal stability, and deflection and strain calculations based upon the actual structural design. This team will make required adjustments to design assumptions as instrumentation information is acquired.

GEOTECHNICAL ADVISORY COMMISSION INTERACTION

The Anchorage Port Expansion Team has been coordinating with the Municipality of Anchorage's Geotechnical Advisory Commission (GAC). The GAC acts in an advisory capacity to the Anchorage Assembly, Mayor, Municipal Departments including the Port of Anchorage, Planning and Zoning Commission, Platting Board, Building Board, Building Safety, and the professional design community by providing professional advice on issues relating to natural hazards risk mitigation. The coordination between the Anchorage Port Expansion Team and the GAC is on-going.

Meetings (described below) have been held between the Anchorage Port Expansion Team and the GAC to solicit input and respond to technical questions.

- June 2003 – The field and the laboratory testing programs were introduced to the GAC for consultation. The GAC provided input and comments which were incorporated by MARAD.
- July-November 2003 – On-going discussions with the GAC were conducted during the field program, including a second meeting to discuss the field test findings.
- December 2003 – A draft report defining the data collection and laboratory findings was provided to the GAC to solicit comment, "Marine Geotechnical Exploration, Volumes 1 and 2."
- February 2004 – A meeting with the GAC was conducted to discuss the draft report and summarize the status of preliminary findings. At that time, data reduction was still underway. The Advisory Committee was reviewing the draft report and studying the data to recommend shear strength parameters.
- March 2004 – The final Marine Geotechnical Exploration report of preliminary findings was provided to the GAC and discussed. (This information was also posted to the project website: www.portofanchorage.org/library.)
- March 30, 2004 – The GAC issued a Resolution (attached) recommending to the Mayor: (A) the GAC be provided opportunities for continued involvement; (B1) support for the rationale for selection of seismic design and performance criteria especially those differing from local code, which included convening an independent panel of experts and governing officials to develop consensus criteria; (B2) future studies be provided to describe site specific response and impacts on design criteria; and (B3) an independent third party peer review of the technical aspects of the work, such as the stability of design options and impacts of variations in material properties.

CURRENT RESOLUTION STATUS

(A) The GAC be provided opportunity for continued involvement.

MARAD will continue to coordinate with the GAC as the future structural design progresses. Both MARAD and the Anchorage Port Expansion Team view the interaction with the GAC as an on-going process. The GAC will be kept appraised of on-going developments as the structural design and geotechnical review process are underway in accordance with established resolutions. Further, the GAC will also have opportunities to review structural instrumentation data as the project progresses.[1]

(B1) Rationale for selection of seismic design and performance criteria especially those differing from local code, which shall include convening an independent panel of experts and governing officials to develop consensus criteria.

Upon GAC recommendations, the Municipality established a Port of Anchorage Seismic Design Committee (Mayoral Blue Ribbon Panel) of experts and governing officials to establish seismic design criteria. This panel met in June 2004 to review MARAD's geotechnical program to date and to independently select the seismic design parameters and seismic recurrence interval for the project based upon risk and economics. This panel did develop consensus seismic design criteria. Members of this panel included: the Executive Director of Economic and Community Development for the Municipality (Ms. Mary Jane Michael), the Municipal Engineer (Mr. Howard Holton, P.E.), an acting member of the GAC and consulting geotechnical engineer (Mark Musial, P.E.), a consulting earthquake engineer who also published the American Society of Civil Engineers (ASCE) manual for port design criteria (Stuart Werner, P.E.), and the Director of the Port of Anchorage (Former Governor Bill Sheffield). Those seismic design parameters were provided to MARAD via a Municipal Resolution issued by the Blue Ribbon Panel (see attached). Based upon those seismic design parameters, MARAD's geotechnical team performed analyses for the only two design alternatives that met the global stability requirements: (1) open cell sheet pile; and (2) pile supported deck. This global stability report was issued by Terracon on September 14, 2004. As the report indicated, Terracon found both options were feasible from a geotechnical global stability analysis and from a preliminary 2D *FLAC* and internal stability prospective. Various separate Terracon reports were issued late 2004 and early 2005 to describe *FLAC* and internal stability. These reports included the preliminary 2D *FLAC* analysis of the alternative design options developed by Dr. Hashash with synthetic earthquake waveforms including one similar to the 1964 earthquake. The selection of the seismic return periods for this project have been developed based upon the International Building Code as modified by the Municipality of Anchorage codes and standard practices in the port design industry.

(B2) Future studies be provided to describe site specific response and impacts on design criteria.

A meeting with the GAC was conducted in June 2005 to present results of all studies to date including global stability analysis, 2D *FLAC* analysis, internal stability analysis, and results of the site specific seismic response study. The open cell sheet pile structure was presented as the preferred alternative. The open cell sheet pile structure performed better than other design alternatives modeled in internal stability analysis under required seismic loading with less deflections and similar safety factors under seismic loadings.

(B3) Independent third party peer review of the technical aspects of the work, such as the stability of design options and impacts of variations in material properties.

As reflected in the attached chart and as discussed above, an independent Advisory Committee was established to review technical aspects of the work. In addition, MARAD will require the future design team to reevaluate the geotechnical aspects of the work developed by Terracon. Finally, the methods of

[1] As construction proceeds, the completed portions will be outfitted with structural instrumentation. The resulting data will be provided to the GAC throughout the expansion effort.

dealing with the seismic performance will be addressed by MARAD's structural engineering design team as the design is developed. All work to date by MARAD's contractors, Terracon and the Advisory Committee, have provided a non-biased independent review of the geotechnical issues, separate from details that will be provided by the future structural design team. Indeed, the future structural design team is required to establish an independent geotechnical and structural evaluation and will be held liable for errors and omissions associated with their final design. Terracon will continue to conduct peer review for geotechnical work by the future design team.

- On August 15, 2005 – The GAC sent a letter to the Port of Anchorage Director. The letter provided excerpts from the March 30, 2004 GAC resolution. MARAD is preparing a response to that letter and additional coordination with the GAC will continue.

ATTACHMENTS:

A: June 29, 2004 Summary of Geotechnical Analysis – Mayor's Blue Ribbon Panel

B: Geotechnical Flowchart

C: Independent Advisory Committee Resumes

D: March 30, 2004 Geotechnical Advisory Commission Resolution

E: June 29, 2004 Port of Anchorage Seismic Design Committee (Mayoral Blue Ribbon Panel) Resolution

SUMMARY OF GEOTECHNICAL ANALYSIS

Port of Anchorage Intermodal Expansion

Mayor's Blue Ribbon Commission

June 29, 2004

INTRODUCTION

There is always some level of risk that must be accepted when designing for an earthquake. This is especially true in Anchorage. Anchorage is one of the highest risk areas and most seismically active areas in the world. However, there has not been a strong earthquake event since the 1964 earthquake. Consequently, the waveform, intensity and duration of the design earthquake must be determined through computer simulation using the best estimates of the seismologists. Any decision regarding the nature and extent of seismic risk reduction accomplished for the Port of Anchorage (POA) project will have costs associated with it as well as benefits. The remaining risks are then termed acceptable seismic risks, in the sense that the additional costs that would be required to reduce them further are not tolerable. For this reason, we have prepared analysis for the Municipality of Anchorage (MOA) and the Port of Anchorage (POA) to determine the appropriate seismic risk profile and the estimated levels of damage to the wharves and piers when subjected to the various levels of earthquakes anticipated. We trust that this will assist the MOA and POA in selection of the most appropriate risk levels.

OBJECTIVES AND SCOPE OF WORK

The program that Terracon undertook in the spring of 2003 was designed to provide the majority of the data necessary to develop the marine geotechnical design parameters and subsurface stratification for the expansion of the Port of Anchorage Wharf and Barge Loading intermodal expansion area. This information has been used to date to evaluate the feasibility of construction from a global stability standpoint of two primary options for the earth retaining structures and to select the design parameters for the placement of fill material and the construction of foundations in the wharf offshore areas.

Twenty soil test borings were drilled and thirty-eight Cone Penetrometer Tests (CPTu) were performed from an offshore jack-up platform for the subsurface exploration. The borings/CPTu were drilled to depths ranging from 150 to 210 feet below the mudline. They were generally located along two lines parallel to the existing wharf, at about 200 feet and 400 feet seaward from the wharf. See Figure 1 for the location of the test locations. One in-situ vane shear test hole, three seismic shear wave velocity tests and seven pore pressure dissipation characteristic tests were conducted during the field program.

The Geotechnical Advisory Commission (GAC), the independent consultants, Paul Mayne, PE, Ph.D. and Peter Robertson, PE, Ph.D. and the POA were issued a draft report on December 11th for

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comment. The completed report was issued on February 4th, 2004.

As a result of the review by these groups, there were several comments, recommendations and requests to perform additional studies. In addition, Terracon identified areas for additional, more detailed studies. In summary, those additional studies to be completed are as follows:

- Complete the site specific seismic response analysis by Dr Hashash.
- Dr. Mayne recommended that area specific global slope stability analysis using SHANSEP procedures be conducted for the seismic analysis and consolidated drained parameters for the long term case analysis.
- Conduct numerical analysis concerning the soil structure interaction during static and dynamic loading of the two structures to check stability.
- Determine the extent of softer soils that require removal prior to construction.
- Provide specific recommendations for the staged loading procedures associated with fill placement.
- Provide recommendations concerning the seismic response spectra to be used in design of the wharf and barge loading facilities and outlying areas.
- Evaluate the potential sources of engineered fill material.

The ongoing studies were approved by the POA Expansion Team on March 15th to proceed and to finalize selection of the alternatives, define the phasing of construction and provide input to the 35% cost estimating for the water front structures by July. This will allow the lead-time required to order steel and select engineered fill material to start initial construction in 2005. There are six (6) subtasks currently being accomplished by Terracon. They are as follows:

- Engineered Fill Evaluation and Source Approval
- Soil Structure Interaction Under Earthquake Loading
- Geotechnical Technical Specifications
- Geotechnical Consulting-Road and Rail Project
- Geotechnical Stability and Pavement Analysis
- Preparation of Design Manual and Documentation

OPTIONS FOR CONSTRUCTION

There are two concepts being considered by the Port of Anchorage for docking of ships and the north barge terminal:

1. Open cell sheet pile (OCSP)
2. Marginal wharf or pile-supported deck (PSD)

For both options, advancing the dock face seaward 400 feet will allow for the placement of new engineered fill in areas landward of the loading/unloading zone. Moving the dock seaward and placing sand fill that can be compacted in-place to a medium dense state will improve the performance of critical areas during seismic events and increase the global stability for both options. See the attached Figure 2 for the Proposed Port Intermodal expansion and preliminary phasing. Figures 3 and 4 depict the two possible options of OCSP and PSD.

There are operational advantages to using the OCSP concept over the PSD concept. First, the PSD or marginal wharf option has exposed individual piling that are subject to corrosion, scour and heavy ice build up during the winter. The ice rine, which forms on the piling, tends to scour the piling and to create on-going maintenance issues with corrosion and build-up of static electricity. The costs of maintenance for the PSD is estimated to be greater than the OCSP. The massive soil and sheet pile structure of the OCSP is capable of withstanding greater lateral loads and is less likely to be damaged from ships, ice, wind and wave loading. It offers a cleaner solution by presenting a continuous sheet piling face over its entire length even at low water levels and continuing with this same strong material to support land side structures for at least 250 feet behind the wall. The sheet pile wall construction is relatively simple, can be handled by local contractors and is built quickly.

There have been some 71 OCSP systems installed in Alaska but none to the height of the present project. This project requires a sheet pile length of approximately 95 feet with a free height of approximately 85 feet at the lowest proposed dredge elevations. The highest length to date has been at Port Mackenzie that is approximately 60 feet in unsupported height. There have been two noted problems with the OCSP concept. The fill material settled at Port McKenzie post construction. This was evaluated and attributed to lack of compaction of the engineered fill due to frozen material in the fill. This issue has been rectified and the OCSP has had no further issues to our knowledge. The second known problem with the OCSP system was at Red Dog where the wall failed during construction. This was caused apparently by a tidal wave striking the wall before fill placement and it caused a fatality. No other information is available to Terracon on the causes of this failure.

The PSD or marginal wharf is the method preferred by most port design engineers in areas of potential seismic activity. There is significant information in the literature on the design and performance of such walls especially in California and Japan. There has been much university research on the subject and the design methodologies are fairly well understood. Significant amounts of seismic data have been obtained in California and Japan.

The main advantages to the docks are that they are relatively flexible (high period) and can be designed to withstand the deflections associated with earthquake movements. They have a consistent, stable platform for the support of the gantry cranes and for roll-on roll-off loading.

The disadvantages for the PSD construction are that a significant amount of earthwork to improve the soils in the slope and immediately behind the platform is generally required. The soil below the structure is unconsolidated, in general, is of low shear strength and not able to resist the lateral earthquake forces. This requires that particular care be taken to remove and replace unconfined, softer materials. A high grade of 4-6 inch sized quarry run fill below the structure and a armor layer of 2-3 foot diameter stone on the surface is required to avoid global stability issues with shallow soils and scour and erosion of the slope both during and after construction. The concrete deck contains numerous construction joints that require special construction procedures to minimize differential movement on the rail tracks as a result of strong earthquake motions. Construction of such PSD docks is more specialized and more likely to require outside contractors.

There are four main differences between the Port of Anchorage and most West Coast ports where the majority of information concerning marginal wharf design is centered:

- 30 foot tidal fluctuations twice a day in Anchorage
- Significant transportation costs to import construction materials to Alaska
- Better soil conditions than the ports in LA and Oakland in general
- West Coast ports have relatively accurate seismic data.

SEISMIC RISK

In dealing with the issue of seismic risk, it should be noted that the majority of knowledge in the US has been associated with West Coast earthquakes. Consequently, much of the engineering practice and design knowledge is based upon those conditions. There are significant differences in the Port of Anchorage site and the general West Coast sites. First of all, significant earthquakes have occurred in those areas in the last 15 years and therefore, good information on waveform, duration and intensity is available from the advanced instrumentation. This is not the case in Anchorage where there has not been a strong event since the 1964 Good Friday earthquake. Even though instrumentation is now in place, the data is still not available. Second, West Coast earthquakes are the result of fault movements located in the vicinity of the port, generally, less than 20km. This results in higher acceleration values than for earthquakes of the same intensity in Alaska. The Alaska strong motion earthquakes that we are designing for will most likely be a result of plate movements in the subduction zone that is some 80 km away. This is likely to lead to lower acceleration but longer duration waveforms. This means that the soils will be subjected to seismic forces with smaller intensities in Alaska than in the West Coast but will be subjected to more cycles of loading.

The ASCE Port Design Guidelines Document recommends that a two level design approach be undertaken. This is the current practice in most ports throughout the United States and Japan over the past 15 years. The two level approach is described as follows:

LEVEL 1. OPERATING LEVEL EARTHQUAKE (OLE).

Ground motions for this are established to have a 50-percent probability of exceedance in 50 years (an average return period of 72 years). Under this level of shaking, the structure is designed so that operations are not interrupted and any damage that occurs is repairable in a short period (less than 6 months).

LEVEL 2. CONTINGENCY LEVEL EARTHQUAKE (CLE).
Under this second level of design, more severe contingency level ground motions are established that have a 10-percent probability of exceedance in 50 years (corresponding to a 472-year recurrence interval). This recurrence interval is also required for dynamic analysis of earth retaining structures in all Seismic Use Groups I structure by the MOA code. The site is not classified by the Seismically Induced Ground Failure zone map, normally referred to as the 1979 "Harding and Lawson Map" but it is closest to the zone 3.

We evaluated a more extreme event earthquake than recommended by the ASCE document or the MOA code as suggested by the GAC. This event has a 2-percent probability of occurrence. This earthquake has a 2475-year recurrence interval. We have found that in all cases for the OCSP and the PSD these structures are not stable under this earthquake condition. The pseudo static stability analysis found safety factors below 0.8 for both cases. The linear and non-linear DEEPSOIL analysis found strains approaching 3% at the base of the structure. Consequently, this case was not studied further.

The calculated horizontal maximum peak ground acceleration reduced by ½ (horizontal seismic reduction factor) for the pseudo static stability analysis for the range of probabilities and recurrence intervals using NEHRP methods are as follows:

- 0.13 g for a 72 year recurrence interval and a 50% probability of exceedance
- 0.2g for a 475 year recurrence interval and a 10% probability of exceedance
- 0.31g for a 2475 year recurrence interval and a 2% probability of exceedance

These parameters can be compared with surface PGA acceleration of about 0.15g estimated for the 1964 earthquake, the 2nd largest earthquake ever recorded.

Youssef Hashash, Ph.D. of the University of Illinois, has completed the Seismic Site Response Analysis for the Port of Anchorage. It has been submitted to Terracon and the POA for inclusion in our analysis. The findings of this study are summarized in Figure 5 for the upper bound analysis (areas 2,3,5 and 6) and Figure 6 for the lower bound analysis areas 1 and 4. Profile 1a is applicable to areas 4, 5 & 6 and profile 1b to areas 1, 2 and 3. The summary of response data for each area is as follows:

Area	**Period**		
	PGA (g)	*0.1 sec (g)*	*1.0 sec (g)*
Areas 1,4			
OLE-50%	0.12	0.3	0.3
CLE-10%	0.18	0.4	0.40
Areas 5, 6			

OLE-50%	0.12	0.35	0.22
CLE-10%	0.21	0.4	0.35

SOIL CONDITIONS

There are three primary soil formations present below the Port of Anchorage off shore expansion project. The formations present are as follows from deepest to shallowest:

GLACIAL-FLUVIAL OR GLACIO-DELTAIC DEPOSITS.

These are primarily dense sand and gravel outwash deposits with interbedded hardpan clay soils present. These soils are found near elevation –100 MLLW to the south and –150 MLLW along the 400-foot and the 200-foot lines at the port in the center of the site and north. These deposits extend to a depth of greater than 800 feet at the site and overlie metamorphic rock.

THE GLACIO-ESTUARINE OR GLACIO-LACUSTRINE BOOTLEGGER COVE FORMATION.

These soils consist of seven different facies ranging from overconsolidated, firm to stiff lean clays and dense medium sand deposits. The Bootlegger cove is approximately 50 to 100 feet thick at the project area with only the lower two facies present in the project area. The lower facies V is very stiff to hard in consistency and the upper Facies IV material is somewhat less stiff.

HOLOCENE TIDAL FLATS AND FLUVIAL DEPOSITS.

This stratum includes sand, gravel and silt deposits. These deposits, depending upon their position in the profile, can vary significantly in composition, density and consistency due to erosion, reworking by the tides, pre-consolidation and desiccation. Most of the Holocene silt deposits have been removed over the years by dredging and they have been replaced with silts and sands that have been deposited by tidal action and sedimentation.

ANALYSIS

The soils present below the marine off shore port structures will be subjected to stresses and strains as the various stages of the installation are constructed. These stress levels are generally termed construction or end of construction stress cases. Long-term stress cases occur after construction pore water pressures have stabilized and they are referred to as steady state or long term load cases. Stresses and strains induced by transient loads due to extreme events such as earthquakes, tsunamis, ice and ship movements are known as transient cases. The only transient cases considered in this feasibility stage of the project are earthquake cases since such cases generally control the design. Soil strength and thus its resistance to various types of load applications is very dependent upon the loading history, the direction of loading and the speed of application of the load.

There are four basic categories of load application that are applicable to the wharf construction for the POA project.

CASE 1-INSTANTANEOUS APPLICATION OF SOIL FILLS.

This case assumes that the engineered fill for both options is placed instantaneously on the existing soils. This case cannot occur because the fill placement is accomplished over a period of time that allows consolidation and thus strength gain in the soils below the structure. We recommend a safety factor in excess of 1.2 for this case. The soil shear strength for this case is assumed to be the existing undrained ($\phi = 0$) condition, using the CPT determined values and a Nkt of 14.

CASE 2- PARTIAL CONSOLIDATION DUE TO SOIL FILL PLACEMENT (25%).

This case takes into account the strength gain of the soil due to the partial consolidation of the underlying materials. We have learned from the consolidation tests and the insitu pore pressure dissipation tests that the soil will gain strength rapidly as it is loaded. Our calculations indicate that 25% consolidation is reached within a few months of load application. The preliminary construction schedule of load application due to fill placement for either the open cell or the pile supported dock option indicates that the fill placement will occur over a period of 2 to 6 months at any given phase of construction. The shear strength parameters used in this analysis represent consolidated undrained strength at a stage of loading representing 25% consolidation. The undrained strengths are represented by ϕ=0 soils, but with an increased cohesion value over the existing undrained strengths. A minimum safety factor of 1.2 is recommended for this condition. A surcharge of 1000 psf was added 125 feet land ward of the retaining wall.

CASE 3-LONG-TERM LOADING.

This case represents the long term or steady state case where full consolidation of the underlying soils has taken place and all excess pore water pressures are dissipated. This case will likely occur, according to our calculations, within a period of one year after completion of fill placement. For this analysis case, the total consolidated undrained ϕ'and c' soil parameters are utilized in the analysis. We recommend a minimum safety factor of 1.5 for this condition. A 1000 psf surcharge was included from the at the face of the retaining wall landward.

CASE 4-EARTHQUAKE LOADING.

The earthquake loading case represents the stresses and strains introduced as a result of horizontal shaking caused by earthquake induced motions. This shaking tends to build partial pore pressures within the soil that are dependent on the magnitude or intensity of the earthquake and the duration of the motion. Two levels of acceleration and intensity were evaluated as discussed above- the ordinary earthquake that is considered very likely to occur within the useful life of the new port installation and the two contingency earthquakes. Both were analyzed using undrained soil parameters that are representative of the consolidated undrained condition. The parameters were calculated from the Su/σ_{v0} vs. OCR curves prepared by Dr Mayne. They were prepared using the pre-consolidation pressure and CIUC and DSS relationships and are shown on Figure 7. The CIUC curves where used for in the back 1/3 of the failure envelope where the direction of shear is near the vertical. The DSS relationships were applied when the failure envelope approached the horizontal. Unconsolidated Su values calculated from the CPT values were used seaward of the retaining structure. The results of the analysis are shown on Table 1. We recommend a minimum safety factor of 1.1 for the OLE condition against general slope failures (as opposed to shallow sloughing failures which should be 1.2) and a 0.9 safety factor for general slope failures with a 1.0 against sloughing failures. The deflections calculated by the FLAC analysis will control the design for the OLE and CLE cases.

Soil structure interaction studies using a numerical 2D model called Fast Lagrangian Analysis of Continua (FLAC) is currently being performed. The deflections and earth movements for the CLE and OLE are within tolerable limits for the OCSP structure. The interlock stresses calculated in the sheet pile structure are also with the manufactures recommended stress level for static analysis and within overstress allowances for seismic loadings. Final reports on these analysis will be completed within the next few seeks.

FINDINGS AND RECOMMENDATIONS

The surficial soils (stratum 1) along the project 200 and 400 lines are quite variable between the mudline and elevation –50 to – 70 MLLW. A relatively small zone of soft, tidal sediments that consist of loose sands and soft re-worked silts deposited from the Knik Arm sediment load are present most noticeably in the south center of the site in Area 4. The loose sands and soft silts are subject to liquefaction under seismic loading conditions. Selective removal by over-dredging or special procedures to drive the sheet piling deeper in the case of the OCSP to confine these soils will be necessary for both options. The recommended construction dredging depths for both the OSPW and the PSD options prior to dredging and placement of fill have been provided to Tecicon for inclusion in the design documents. Shallow dredging (5 to 10 feet) is required everywhere in general beneath the OCSP and PSD engineered fill. Deeper construction dredging or extension of the sheet pile tip elevations will only be required in limited areas.

The Bootlegger Cove Formation (BCF stratum 2) was found to have the following characteristics that are pertinent to the construction of both options:

- The BCF is overconsolidated, low plasticity clay that is homogeneous and isotropic in structure for the most part with inter-bedded sand layers that vary in thickness from a few inches to 10's of feet. The formation is approximately 50 to 100 feet thick in the study area. It is stiffer to the north and contains more sand layers to the south.
- The BCF gains strength with depth with a significant increase in strength between elevation –90 MLLW and –100. It is unlikely that any failure surface below –120 to–150 would control the stability design of either option due to the stiffness of these materials. The formation is overconsolidated with a pre-consolidation pressure of approximately 14,000 PSF.
- The offshore BCF is not sensitive to cyclic loading and the associated strength reduction, and does not have a tendency to liquefy under seismic loading conditions but does exhibit some anisotropic strength behavior. The soil strength in the horizontal direction is approximately 70%

of the strength in the vertical direction. The sand layers within the BCF are sufficiently dense and confined to preclude strength loss due to seismic forces and loading.

- Considerable strength gain can be achieved in the BCF with a staged approach to loading by the engineered fill material. The time frame to 90 % consolidation from the fill load will occur in approximately one year.
- The very dense sand, hardpan clay and gravels of the Glacio-Fluvial deposits (stratum 3) are present near elevation -150 throughout most of the project and –100 at the south end. These deposits are dense enough to preclude circular deep stability failures.

Based upon the stability analysis, we have determined that the OCSP and the PSD options are feasible for the construction of the port. The safety factors against global stability failure for all four cases listed above are similar for the two systems. We recommend that the two-level design approach using the OLE of 50% probability of exceedence in 50 years and the CLE of 10% probability of exceedence in 50 years be adopted by the Port of Anchorage. There are several issues that must be considered during the 35% tender documents:

- The highest safety factors for both the PSD and OCSP options are in area 5. Both options are likely to survive the CLE with damage that is repairable within a reasonable time frame. Deflections and ground movements are expected to be within tolerable limits.
- The lowest safety factors and the highest deflections are anticipated in a 500-1000 foot wide strip of area 4 near borings 32 and 33. This area may sustain considerable damage from the CLE. In this instance, we believe that the PSD option would have the best chance of survival since the PSD systems reaction under seismic loads is better understood by the engineering community. The design-build bidders will be more confident in the PSD due to it's history of survival in earthquake prone areas.
- Due to the calculation of lateral movements of soil and some heave of material on the seaward side of the OCSP wall in the FLAC analysis for the CLE, we recommend that special precautions be taken to observe the material adjacent to the sheet pile tips. We recommend that quarry run material be placed seaward of the sheet piles to minimize scour and movement during the CLE.
- A staged loading procedure is recommended for the OCSP and the PSD alternatives. Measurement of pore pressures and settlements during construction will be required. The stages of loading have been predicted as discussed in the main body of the report.
- Internal stability of the PSD and OCSP options has been studied with numerical methods by FLAC and through limit equilibrium methods. The recommendations and findings are summarized in two separate reports by Terracon (FLAC Analysis) and by Gary Greene using pseudo-static methods. We have determined that the internal stresses in the OCSP structure under seismic and static loading for all cases are within the manufacturers' tolerances for interlock stress. The deflections of the PSD require further study and should be compared within

MOTEMs design guidelines.

- The tail wall must be extended from the wharf face toward the shore approximately 125 feet to feet minimum safety factors of 1.2 for global stability under seismic and end of construction loading.
- Minimum tip elevations of the sheet piles for the OCSP wall are –63 MLLW. Design pile information for the PSD alternative is provided in the geotechnical report.
- Both options require the removal of soft loose sediment at the mudline and some softer Bootlegger Cove formation soils.
- It is recommended both the PSD and the OCSP structures are constructed from the landside and that the construction dredging and placement of engineered fill be concluded prior to the driving of sheet piles. This procedure will minimize the difficulty of pile placement in the extreme tides and ebb and flow velocities of Knik Arm.

PORT OF ANCHORAGE

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PLANNING DEPARTMENT

November 2, 2006

Chairman Mark Musial
Geotechnical Advisory Commission
Municipality of Anchorage
PO Box 196650
Anchorage AK 99519-6650

Re: Response to GAC Resolution 2004-01

Dear Mr. Musial:

This correspondence responds to the Geotechnical Advisory Commission's (GAC) letter dated August 15, 2005 to Governor Bill Sheffield, Port Director. In order to adequately address the Commission's comments, we delayed our response to allow the preliminary dock design to commence and to complete an independent review of the design criteria and underlining geotechnical data. To reply earlier would have been premature and with the additional criteria available we are prepared to provide a response to your letter.

The Port of Anchorage (POA) expansion project is a federal project administered by the U.S. Department of Transportation, Maritime Administration (MARAD), and is not a Municipal project. MARAD's mission statement is *to improve and strengthen the U.S. marine transportation system - including infrastructure, industry, and labor - to meet the economic and security needs of the Nation. MARAD programs promote the development and maintenance of an adequate, well-balanced U.S. merchant marine, sufficient to carry the Nation's domestic waterborne commerce and a substantial portion of its waterborne foreign commerce, and capable of service as a naval and military auxiliary in time of war or national emergency. MARAD also seeks to ensure that the United States maintains adequate shipbuilding and repair services, efficient ports, effective intermodal water and land transportation systems, and reserve shipping capacity for use in time of national emergency.*

The expansion project is divided into two major phases, each having independent utility and an annual program of projects. Phase I is nearing completion, and adds approximately 24 acres of stable ground for critical Port operations. Phase II is in final design with construction planned for years 2007 – 2012.

The various bid packages for construction are not intended to use a design-build project delivery methodology as stated in your letter, but rather a design-bid-build approach. MARAD and the POA determined the latter process provides greater value to the government and ensures the final product better meets the POA's design criteria. Each season is a stand-alone complete bid

EXHIBIT U

package competitively bid to industry in accordance with the Federal Acquisition Regulations and federally approved purchasing practices through MARAD's program manager, Integrated Concepts & Research Corporation (ICRC).

A permit from the Municipality of Anchorage (MOA) Building Safety Division associated with the dock expansion will not be sought. A permit of this nature has not been required by the POA in the past for in-water construction activities, and the MOA Building Official continues to advise MARAD and POA that Municipal permit jurisdiction does not apply to the currently proposed improvements. The POA will, however, seek permits for the construction of any occupied facility or any structure for which the MOA issues permits.

As for specific concerns identified in the Commission's letter, the following responses are provided to clarify and better inform the Commission of the project's current status and address comments related to GAC Resolution No. 2004-01 Items B.1 and B.3.

Essential Facilities:

The POA is an essential part of the local community, the Southcentral region, and the State of Alaska. The POA's mission is *to provide a safe, modern, and efficient facility capable of effectively handling the large quantity (nearly 5 million tons in 2005) and variety of cargo entering and leaving the Port and simultaneously meeting future growth demands.* The POA is the largest of Alaska's 95 ports and harbors accommodating cruise vessels and a full range of maritime commodities, including container, trailer, break-bulk, dry-bulk, and liquid-bulk cargos. The Purpose and Need section of MARAD's Environmental Assessment (March 2005), clearly delineates the critical nature of this facility. And, as an economic leader, the POA generates more than $750 million annually for the State economy.

Because of the POA's proximity to Elmendorf Air Force Base (EAFB) and Fort Richardson, the facility is a federally designated strategic location for supporting rapid deployment of all U.S. Army Alaska (USARAK) combat forces. The POA and MARAD developed partnerships with the military to ensure the expansion project meets or exceeds Department of Defense needs.

The POA stages 100 percent of the exports of refined petroleum products from the State's largest refinery (in Fairbanks) and facilitates petroleum deliveries from smaller refiners on the Kenai Peninsula and in Valdez. Approximately 60 percent of inbound freight is destined for Anchorage, with the remainder destined for delivery throughout the State (VZM 1999).

The POA continually processes the following goods and freight:

- The majority of jet fuel for Ted Stevens Anchorage International Airport (AIA) - the fourth busiest cargo airport in the world, JP-8 fuel for Elmendorf AFB, and petroleum products for Alaska's bush area;
- Goods for all major military installations; and
- Wholesale goods for major retail distributors and grocery stores.

The facility provides "just-in-time" service to many businesses; goods that arrive on Tuesday generally are available to customers in stores on Wednesdays. Thus, the POA fulfills a vital role for Anchorage, the State of Alaska, and the nation.

The POA differs with the opinion of some GAC members who consider the entire port facility as "essential" as defined within the International Building Code for occupied facilities. In the event of an extreme seismic event, the Port Administration agrees a portion of the infrastructure must be able to remain operational in order to support recovery operations by being able to handle a sufficient volume of food, petroleum, and other critical materials for communities served by this facility.

Seismic Criteria:

The MOA's Seismic Design Committee fully recognized the critical nature of this facility when adopting the seismic design criteria for the expansion project. The Committee, appointed by MOA Mayor Mark Begich, was composed of an independent panel of experts and governing officials. The Committee's consensus agreement provided the final seismic design criteria and methodology for the project. Their recommendation to MARAD was that the project *"examine and evaluate the physical and economic feasibility of designing, at a minimum, one berth to withstand a seismic event greater in scope than the Level 2 Contingency Level Earthquake (CLE) in order to provide an emergency point of entry for goods and supplies necessary to support the community. Said evaluation should consider cost and risk implications of such a design."*

In a detailed technical presentation to the GAC on September 27, 2006, the project designer, PND Engineers, Inc. (PND), explained our response to the Committee's recommendation: *two* ship berths are currently being designed to withstand maximum seismic loading well above a Level 2 (CLE) earthquake. One of the two berths will be designed to handle general cargo; the other will be designed to handle a combination of petroleum, oils, and lubricants; dry bulk cement; and general cargo. These two berths, along with the barge facilities contemplated in the final design, are adequate to serve the Anchorage community and the State of Alaska in the event of a major seismic disruption and far exceed existing conditions. ~~These berths will be referred to as "Essential Facilities."~~ The 2,800 feet of new berthing facilities will withstand a Maximum Credible Earthquake (MCE); whereas the existing 2,400 feet of berthing at the Port will not withstand a MCE, and probably not a CLE. This design approach recognizes funding limitations while focusing on the critical nature of fueling and cargo to support the State following a natural disaster.

The POA does not agree with the GAC's additional request to over-design the full length of the bulkhead and infrastructure to withstand critical seismic events while the utilities and roads leading to the port are not designed to equal criteria. The POA suggests the MOA, GAC, State of Alaska and U.S. Army Corps of Engineers (USACE) review area-wide sustainability of critical transportation infrastructure following major seismic events. This study may require a plan to allow cooperation with other Alaska or out-of-state ports if access to the POA or to Anchorage is disrupted due to a major seismic event. We suggest the GAC work in concert with the MOA on emergency preparedness planning as a result of catastrophic seismic activity within the Anchorage bowl including POA readiness.

The final design team continues to perform detailed analyses of the open-cell bulkhead for all development areas and all soil conditions. PND and its subconsultants are considering GAC comments as they perform global stability analyses. PND intends to use the static and seismic design and performance criteria provided to the GAC as the basis for their work. The geotechnical analysis is expected to be complete by the end of 2006.

Codes and Standards:

The POA and MARAD recognize there are no directly applicable established design codes or design standards for dock structures. PND will follow the American Society of Civil Engineers (ASCE) "Seismic Guidelines for Ports" (current edition), as well as ASCE's "Minimum Design Loads for Buildings and Other Structures", and incorporate local codes for other portions of the project as they apply. The ASCE guidelines are a performance-based design approach using the best available standards. PND's design team selected rigorous seismic design criteria exceeding the criteria outlined by the MOA's Seismic Design Committee.

PND performed a recent comparison of the selected CLE and MCE with the Anchorage Earthquake Catastrophic Disaster Response Plan (CDRP) prepared by the USACE dated January 11, 2005. The CDRP addresses two seismic scenarios including a shallow crustal earthquake and a Megathrust fault. The PND design team found the Miyagi-Oki earthquake, selected as a worse case event for the project, is larger than the CDRP crustal earthquake in terms of total energy, and is comparable with CDRP Megathrust earthquake at the MCE level.

Review Process:

Terracon Consulting Engineers, Inc. (Terracon), a well established national geotechnical consulting engineering team, began the geotechnical feasibility program in 2003. The PND design team's independent approach, coupled with previous site investigations and geotechnical analysis by Terracon, was developed to perform multiple independent reviews by experts. PND teamed with GeoEngineers, Inc. and VECO Alaska, Inc. to perform rigorous independent analyses. In this approach, the team members work independently and then convene to compare results. This approach worked successfully during the past several months of global stability analysis. The combined results demonstrate the proposed design is applicable to the site and to the established criteria.

Redundancy:

Structural redundancy was another concern expressed by the Commission. PND addressed this concern in the following manner:

- Stresses at the face are reduced by providing closely spaced tail walls over the entire bulkhead wall.
- Each sheet pile cell is independent; interlock stresses are kept low and unzipping of interlocks is unlikely but also limited to that cell.
- The open-cell system is ductile and moves without impact to operations.
- To provide load distribution if cells in one area become more highly loaded, a large reinforced concrete cap beam is planned along the entire dock face.
- To provide additional resistance to global movements, large-diameter crane rail piles are included in some areas.
- To minimize dock movement, a concrete apron slab will be provided in essential areas.
- To eliminate catastrophic collapse, construction joints have been included.
- Weak soils will be either compacted or removed prior to installation of the bulkhead.

Reported Failures:

A misconception from previous materials provided to the GAC is the issue of open-cell failures. The GAC reported failures occurred at the Red Dog Mine site and in Skagway. The Red Dog project was a sheet pile closed-cell and not an open-cell. PND was not involved with the original design but was asked by the owner, the Alaska Industrial Development and Export Authority, to help resolve the partial failure. In Skagway, partially complete open-cells were displaced when a portion of a major underwater slide intersected with the dock. A replacement dock has been constructed along with another open-cell structure. Over 140 completed open-cell projects have had no failures, despite experiencing several thousand seismic events and other severe environmental loading. The tallest open-cell wall face in a serious seismic zone has been about 60 feet at Point MacKenzie and Dutch Harbor.

Modeling:

PND design team's computer modeling work has been carefully compared to the original preliminary work performed by Terracon. PND's design team applied the Finite Element (FE) program PLAXIS, whereby Terracon applied the Finite Difference (FD) program, FLAC. PLAXIS and FLAC are complex commercially available state-of-the-art programs. In addition, the design team added separate programs for static analyses. Each member of the PND team who performed FE analyses (PND and GeoEngineers) approached PLAXIS with different models to perform the work. By encouraging each team member to use different methodology and comparing results after rigorous analyses between the design team and Terracon, the results demonstrate the applicability of the modeling approach, providing similar results.

Instrumentation during Construction:

Terracon and PND will perform instrumentation of the open-cell structure during construction to monitor for magnitude and time rate settlement and after completion of the structure by measuring pore water pressure to ensure the construction rate stress increase does not exceed the soil consolidated strength. In addition, the deflections and membrane stresses in the open-cell sheet piles will be measured by wireless continuous reading instrumentation. This will be performed initially to measure the static analysis and confirm the assumptions in the PLAXIS and FLAC analysis. These refined assumptions can then be used to verify the dynamic analysis stresses and deflection.

The Port of Anchorage trusts this response letter addresses the GAC's concerns. The expansion project is in final design development and we appreciate the Commission's input during the planning and design process.

Regards,

Kevin Bruce
Director of Facilities Development

Cc: Diana Carlson, ICRC
Michael Carter, MARAD

INTERMODAL EXPANSION PORT OF ANCHORAGE
OPEN CELL AND PILE SUPPORTED DECK WHARF STRUCTURES
FLAC ANALYSIS FOR 1964 MEGA EARTHQUAKE

PROJECT 70045006.002
APRIL 5, 2005

Prepared By:

Terracon
Lenexa, Kansas

EXHIBIT V

INTERMODAL EXPANSION PORT OF ANCHORAGE
OPEN CELL AND PILE SUPPORTED DECK WHARF STRUCTURES
FLAC ANALYSIS FOR 1964 MEGA EARTHQUAKE
PROJECT 70045006.002

APRIL 21, 2005

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APRIL 21, 2005

INTRODUCTION

FLAC analysis of the planned wharf structures of the Intermodal Expansion - Port of Anchorage, Alaska Project has been performed for 1964 Mega earthquake wave. The analysis has been performed for both the open cell and pile supported deck wharf structures. The geological subsurface profile at the wharf section and geometries of these wharf structures were detailed in previous reports Terracon Project 70045006 and 70045006.001, where FLAC analysis results for working level and contingency level earthquake waves were provided. In this report, the results of the FLAC analysis with the Mega thrust earthquake wave are presented.

WHARF SECTIONS CONSIDERED IN THE ANALYSIS

Figures 1A and 1B depict the Open Cell and Pile Supported Deck wharf structures, respectively considered in the analysis. The figures also exhibit the subsurface geological profile considered in the analyses.

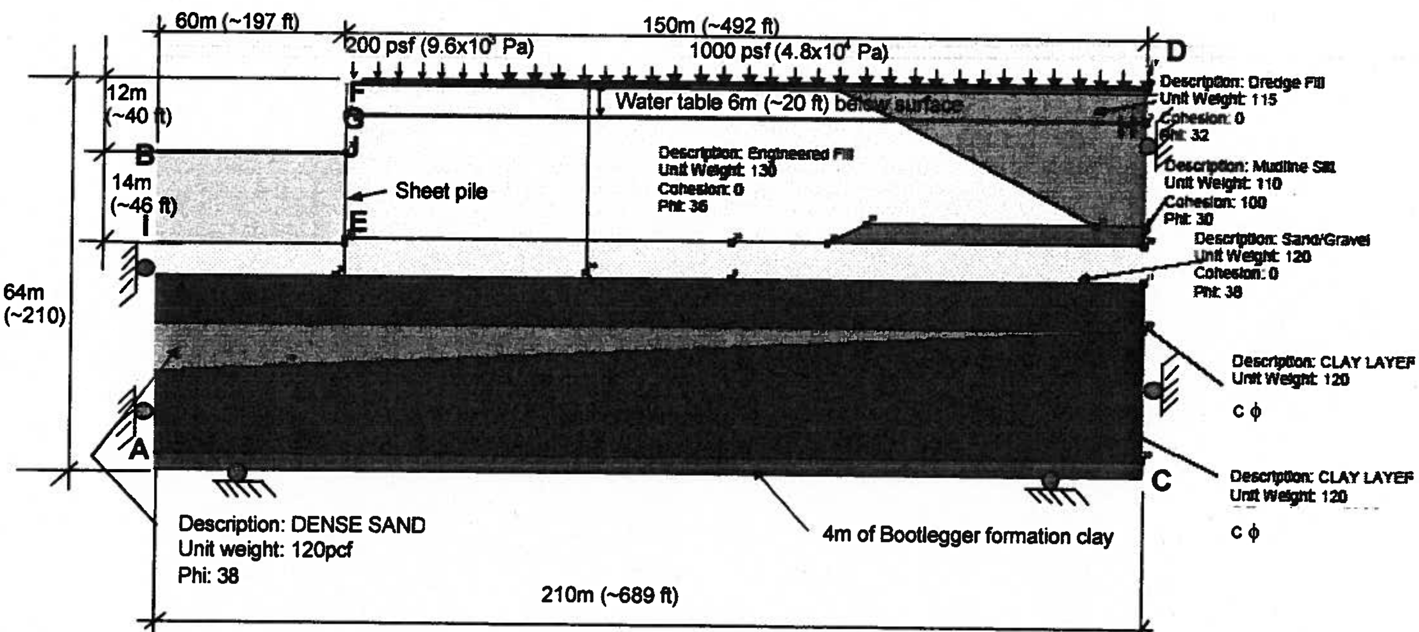


Figure 1A. Open Cell Structure on Area 3 Geological Profile

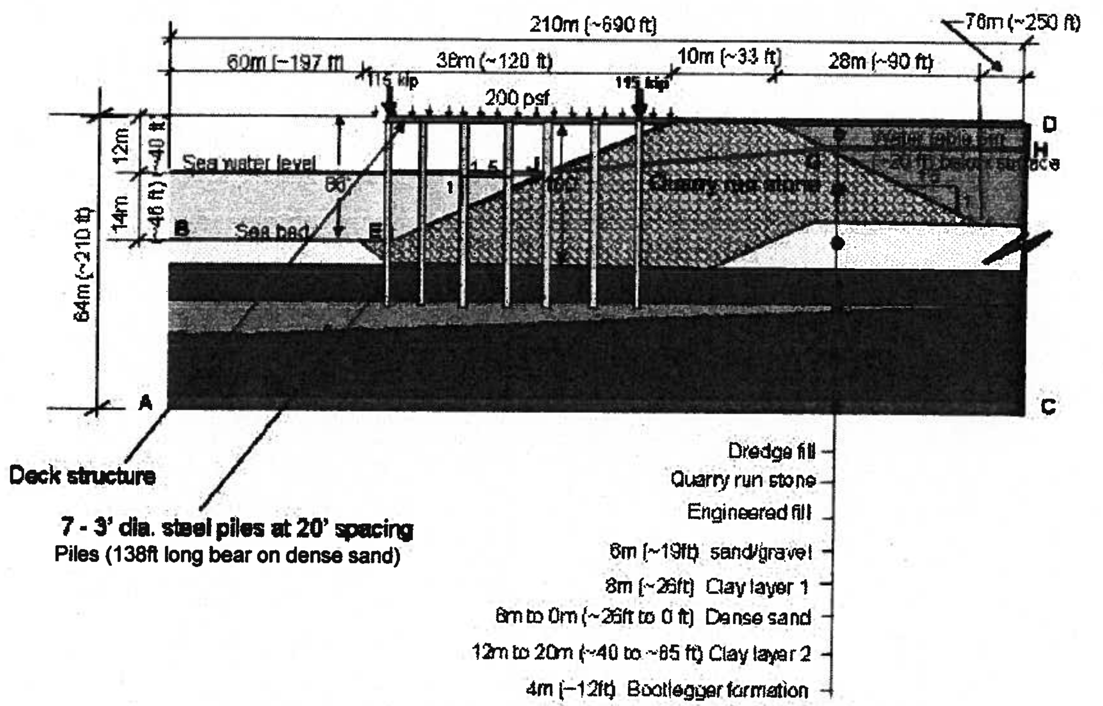


Figure 1B. Pile Supported Deck Structure on Area 3 Geological Profile

Drained soil stiffness and drained Mohr-Coulomb shear strength parameters were used in the analysis. Tables 1A and 1B present the soil properties and parameters in the SI and US Units respectively.

Table 1 A. Soil properties and parameters used in the FLAC analysis (SI Units)

Layer	Density	Saturated density below water table	Young's modulus	Poisson's ratio	$\frac{E}{3(1-2v)}$ Bulk modulus	$\frac{E}{2(1+v)}$ Shear modulus	Cohesion	Friction angle	Constitutive Model
	ρ	$\bar{\rho}$	E	v	K	G	c	ϕ	
	kg/m^3	kg/m^3	Pa		Pa	Pa	Pa	degree	
Stiff Bootlegger formation	2080	2200 (for all material below water table for model simplification)	5.00E+07	0.35	5.6E+07	1.9E+07	1.9E+04	27	Mohr-Coulomb
Clay layer 2	1920		3.59E+07	0.35	4.0E+07	1.3E+07	1.9E+04	27	Mohr-Coulomb
Dense sand	1920		5.00E+07	0.35	5.6E+07	1.9E+07	0	38	Mohr-Coulomb
Clay layer 1	1920		2.30E+07	0.35	2.6E+07	8.5E+06	1.9E+04	27	Mohr-Coulomb
Sand/Gravel	1920		5.00E+07	0.35	5.6E+07	1.9E+07	0	36	Mohr-Coulomb
Mudline silt	1760		5.00E+06	0.25	3.3E+06	2.0E+06	4.8E+03	30	Mohr-Coulomb
Engineered fill (common to OC and PSD structures)	2080		5.00E+07	0.35	5.6E+07	1.9E+07	0	36	Mohr-Coulomb
Quarry run materials (PSD structures)	2240		4.80E+08	0.40	8.0E+08	1.7E+08	0	40	Mohr-Coulomb
Dredge fill	1840		1.00E+07	0.25	6.7E+06	4E+06	0	32	Mohr-Coulomb

Table 1 B. Soil properties and parameters used in the FLAC analysis (US Units)

Layer	Density ρ (pcf)	Saturated density below water table γ_{sat} (pcf)	Young's modulus E (psf)	Poisson's ratio ν	$\frac{E}{3(1-2\nu)}$ Bulk modulus K (psf)	$\frac{E}{2(1+\nu)}$ Shear modulus G (psf)	Cohesion c (psf)	Friction angle ϕ (degree)	Constitutive Model
Stiff Bootlegger formation	130	135 (for all material below water table for model simplification)	1.04E+06	0.35	1.2E+06	3.9E+05	400	27	Mohr-Coulomb
Clay layer 2	120		7.50E+05	0.35	8.3E+05	2.8E+05	400	27	Mohr-Coulomb
Dense sand	120		1.04E+06	0.35	1.2E+06	3.9E+05	0	38	Mohr-Coulomb
Clay layer 1	120		4.80E+05	0.35	5.3E+05	1.8E+05	400	27	Mohr-Coulomb
Sand/Gravel	120		1.04E+06	0.35	1.2E+06	3.9E+05	0	36	Mohr-Coulomb
Mudline silt	110		1.04E+05	0.25	7.0E+04	4.2E+04	100	30	Mohr-Coulomb
Engineered fill (common to OC and PSD structures)	130		1.04E+06	0.35	1.16E+06	3.87E+05	0	36	Mohr-Coulomb
Quarry run materials (PSD structures)	140		1.00E+07	0.40	1.7E+07	3.6E+06	0	40	Mohr-Coulomb
Dredge fill	115		2.9E+05	0.25	1.4E+05	8.4E+04	0	32	Mohr-Coulomb

STRUCTURE ELEMENTS FOR SHEETPILE OPEN CELL

The sheet pile cell was represented as a beam element of the FLAC program. PS31 sheet pile was considered and sectional properties in Table 2 were used in the analysis. The sheet pile extended 6m (~20 feet) into the sea bed.

Table 2. PS 31 Sheet pile section details

	MOMENT OF INERTIA	Area	Young's modulus
SI units	2.2×10^{-6} m^4	9.60×10^{-3} m^2	200×10^9 pa
US units	5.3 in^4	14.9 in^2	2.90×10^7 psi

STRUCTURE ELEMENTS FOR PILE SUPPORTED DECK STRUCTURE

The concrete deck structure was represented as a beam element of the FLAC program. The deck section should be thicker in the area below the wharf crane track, however, to simplify the analysis and reduce FLAC analysis time, a uniform 0.6m (2ft) deck slab thickness was considered in the analysis.

Table 3. Deck * section properties

	Deck thickness	Cross sectional areas	Moment of inertia	Elastic modulus
SI units	m	m^2	m^4	Pa
	0.6	0.6	0.02	$2x10^{10}$
US units	In	In^2	In^4	Psi
	24	24	1152	$4x10^6$

* Homogenous section was considered in the analysis.

The 0.9m (36-inch) diameter steel piles supporting deck structures were represented with the pile element of FLAC program. The steel pile sections were considered to be 0.9m (36-inch) diameter with wall thickness of 7mm (0.28-inch). In this analysis, the steel pile was considered to be a hollow section.

Table 4. Pile properties

	Pile diameter	Cross sectional areas	Pile perimeter	Moment of Inertia	Elastic modulus of steel	Remarks
SI units	m	M^2	m	m^4	Pa	Hollow Pipe Section
	0.9	0.0203	2.826	0.0021	2.00E+11	
US units	inch	in^2	in	in^4	psi	
	36	31.42	113	5012	$2.9x10^7$	

In FLAC, six different parameters are involved in the analysis of pile-soil interaction. These parameters are related to end bearing, skin friction, and lateral load capacity of the pile. These parameters in FLAC's terminology are:

- Stiffness of the normal coupling spring, Cs_nstiff
- Cohesive strength of the normal coupling spring Cs_ncoh
- Frictional resistance of the normal coupling spring, Cs_nfric
- Stiffness of the shear coupling spring, Cs_sstiff
- Cohesive strength of shear coupling spring, Cs_scoh
- Frictional resistance of the shear coupling spring, Cs_sfric

The values of Cs_sfric, Cs_nfric, Cs_scoh and Cs_ncoh were obtained from using the soil properties presented in Table 1A and 1B. Values of Cs_nstiff were estimated using Terzaghi criteria of lateral subgrade modulus "p-y analysis" and values of and Cs_sstiff were estimated using drained Young's modulus of materials. Table 5A and 5B presents the magnitude of these soil-pile interaction parameters for three different soil layers which are in contact with the pile. Note that the innermost pile (left most pile) is in contact with the sand-gravel layer for a short distance only. However, in our analysis parameters of quarry run stone is used for this sand-gravel section.

Table 5A. Soil/Pile interaction properties and parameters used in the FLAC analysis (SI units)

Layer	Stiffness of normal coupling spring (normal to pile axis)	Cohesive strength of normal coupling spring (normal to pile axis)	Friction angle of normal coupling spring (normal to pile axis)	Stiffness of shear coupling spring (along pile axis)	Cohesive strength of shear coupling spring (along pile axis)	Friction angle of shear coupling spring (along pile axis)
	Cs_nstiff *	Cs_ncoh	Cs_nfric	Cs_sstiff	Cs_scoh	Cs_sfric
	Pa/m	Pa/m	Degree	Pa/m	Pa/m	degree
Quarry fill materials	2.71E+07	0	40	4.80E+08	0	40
Clay layer 1	5.43E+07	1.90E+04	27	2.3E+07	1.7E+04	27
Dense sand	1.36E+07	0	38	5.00E+07	0	38

Table 5B. Soil/Pile interaction properties and parameters used in the FLAC analysis (US units)

Layer	Stiffness of normal coupling spring (normal to pile axis)	Cohesive strength of normal coupling spring (normal to pile axis)	Friction angle of normal coupling spring (normal to pile axis)	Stiffness of shear coupling spring (along pile axis)	Cohesive strength of shear coupling spring (along pile axis)	Friction angle of shear coupling spring (along pile axis)
	Cs_nstiff *	Cs_ncoh	Cs_nfric	Cs_sstiff	Cs_scoh	Cs_sfric
	pci	psf/ft	degrees	psf/ft	psf/ft	degree
Quarry fill materials	100	0	40	1.00E+07	0	40
Clay layer 1	200	400	27	4.8E+05	360	27
Dense sand	50	0	38	1.04E+06	0	38

* Cs_nstiff is calculated from "p-y" modulus using Terzaghi criteria. A 100 pci, 200pci and 50pci were used from quarry fill material, clay layer and dense sand material.

Pile End Conditions

The top ends of the piles were connected to the deck structure with pin joints such that no bending moment could develop. The bottom end of the piles were attached with the finite difference grids of the soil mass. The bottom end of pile moved together with the soil grid when soil mass developed deformation/displacement during static and dynamic analyses.

WATER PRESSURE AND WATER TABLE

Open Cell Structure

In accordance with the sea level shown in Area 3 profile, a water pressure of 14 m (46 feet) hydrostatic head was applied against the seabed left of the sheet pile wall in Figure 1A. A triangular distribution of water pressure was also applied on sheet pile wall from the seaside. The triangular water pressure was applied as a horizontal normal force on each structural node of the sheet pile. The force was calculated by taking the sum of the water pressure distributed between two nodes. The water table within the earth structure section was defined at elevation +6m (~20 feet). Saturated soil density was used for zones below the water table.

Pile Supported Deck Structure

A triangular distribution of water pressure was applied on the side slope of the embankment seaside. The water table within the embankment structure section was defined at elevation +6m (~20 feet) on the dredge fill area, lowered down to meet the sea level in the slope. Saturated soil density was used for zones below the water table.

LIVE LOAD SURCHARGE

Open Cell Structure

Uniform live load surcharge pressures of 9.6×10^3 Pa (200 psf) and 4.8×10^4 Pa (1000 psf) as shown in Figure 1A were applied on the surface of the wharf structure. The 9.6×10^3 Pa (200 psf) was applied for a distance of about 36m (~120ft) from the edge of the cell structure and 4.8×10^4 Pa (1000psf) was applied from 36m (~120 feet) to the remaining width to the right boundary of the section.

Supported Deck Structure

Surcharge pressures of 9.6×10^3 Pa (200 psf) live load were considered on the surface of the deck structure. Equivalent point loads (span x surcharge pressure) were applied to the beam nodes that are connected to the pile elements. Additionally, surcharge loads of 5.1×10^5 N (115 kips), representing wheel loads of crane loading were applied to the outermost and innermost piles. This is detailed in Figure 1B.

SEISMIC WAVE

The Alaska-Aleutian mega thrust reportedly has been responsible for several of the largest earthquakes known in instrumental seismology, including the 1964 Prince William Sound (Mw 9.2) and 1957 Aleutian (Mw 9.1) earthquakes. USGS assumes that the maximum earthquake possible at the mega thrust is 9.2. The closest distance from the planned Port of Anchorage wharf site to the mega thrust is approximately 58.7 km.

The synthetically developed 1964 mega thrust earthquake motion was provided by Dr. Youssef Hashash from the University of Illinois, Urbana-Champaign. The provided motion was the output from the site response analysis at a depth of approximately 84ft below seabed. Figure 2 shows the time history of acceleration records. This earthquake loading was used in the analysis.

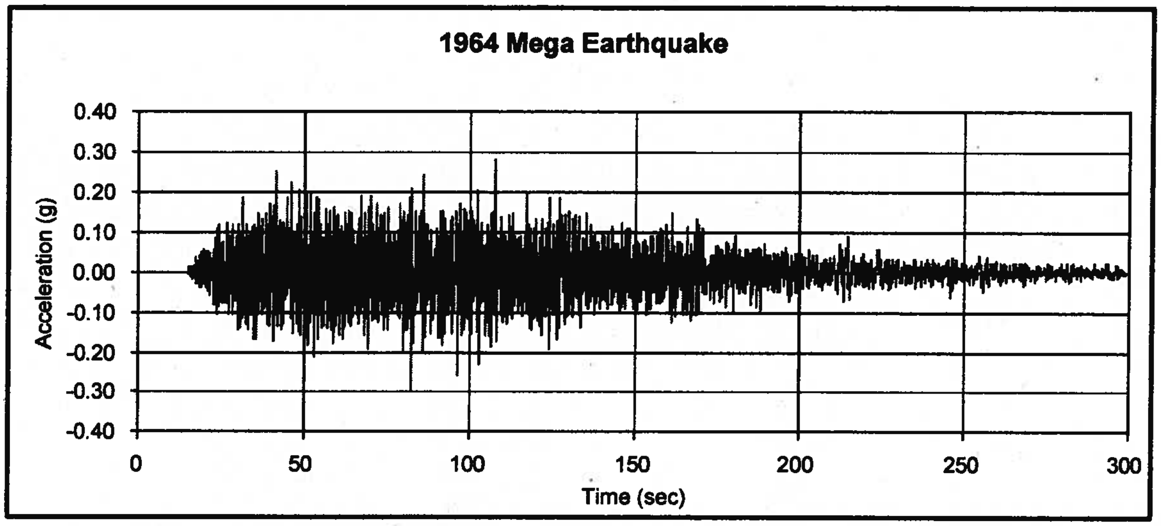


Figure 2. Ground motion time history curve for 1964 Mega Earthquake

FLAC ANALYSIS STAGES

FLAC analysis was carried out at two stages: a) static analysis which performed load/displacement analysis to reach static equilibrium under gravity loading and live load surcharge, and b) dynamic analysis where seismic wave was applied to statically equilibrium state. These analysis stages are discussed in detail in previous reports Terracon Project 70045006 and 70045006.001. Both static and dynamic analyses were performed using Mohr-Coulomb material model for all soil structure. Analysis was performed with the consideration of the plane strain condition; dimension perpendicular to the plane of consideration was considered to extend to infinity. Large strain mode was selected for the static analysis so that grid could deform during the analysis.

In the analysis of the Open Cell Structure, a 2m (1 FLAC zone) wide soil column on the sea side of the sheet pile wall (Case 3 in Terracon Project 70045006) was assumed. The soil column acted as spring element and provided uniform flexible lateral support to the sheet pile wall. This is illustrated in Figure 3.

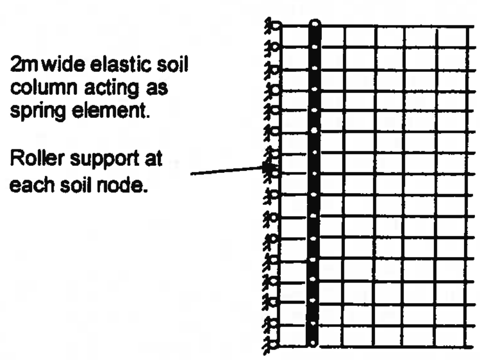


Figure 3. Lateral support to sheet pile wall

The stiffness of the spring elements was calculated using Terzaghi criteria of lateral subgrade modulus "p-y". Modulus of lateral subgrade reaction of ~$19x10^6$ N/m^3 (70 pci), typical for a stiff clay, was used. Young's modulus was calculated to be $4.6x10^5$ Pa ($9.6x10^3$ psf) and using Poisson's ratio 0.3, the bulk and shear moduli of these elements were calculated to be $1.04x10^4$psf ($5x10^5$ Pa) and $4.2x10^3$psf ($2x10^5$ Pa) respectively. A 2000kg/m^3 was considered as the density of these elements. This support condition was used for all seismic analyses.

Dynamic Analysis

Dynamic analysis was performed with the data of acceleration histories of various motions. The data was supplied in 'g' unit, which was converted into m/sec^2 to make it consistent with other units.

FLAC has Raleigh damping and local damping input options. The local damping coefficient, which is equal to π D, was used. The value of damping ratio D was selected to be 5% based on Figure 7 and 8 of the report "Port of Anchorage Seismic Site Response Study" developed by Dr. Youssef Hashash, dated April 22, 2004. All analyses were carried out using 5% damping ratio.

Dynamic analyses were performed using the file that was saved at the end of static analysis and adding the necessary dynamic input parameters and commands. To study the effect of seismic loading, all displacement/strains and velocity vectors developed during the static analysis were set to zero. But the stresses developed due to gravity load during the static analysis were not set to zero. Dynamic analyses were performed with free field boundary on the left and right vertical boundaries for both Open Cell and Pile Supported Deck Structures. Initially, FLAC's large strain analysis mode was selected so that grid could deform during the analysis. Both the left and right boundaries of both Open Cell and Pile Supported Deck structures showed excessive displacements (See Figure 4) that caused FLAC program to stop analysis after about 80 second of time period.

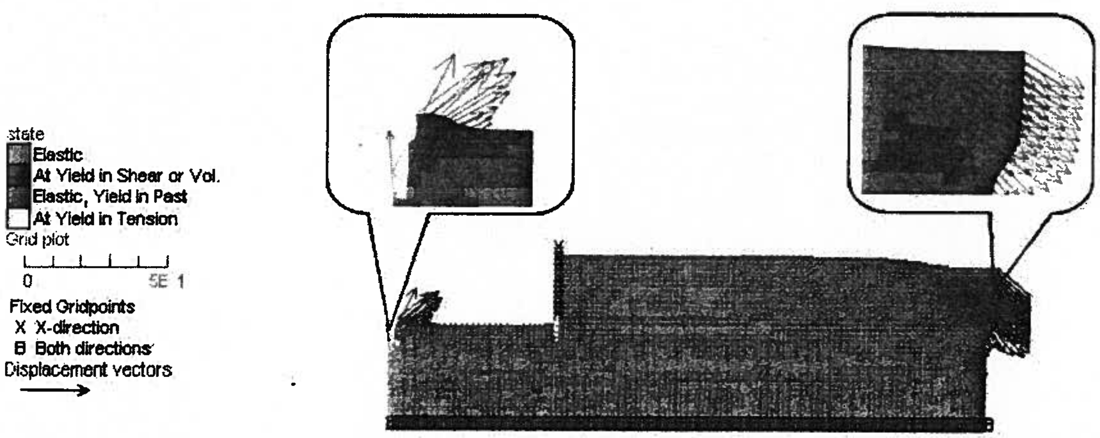


Figure 4. Deformed grid shapes at the boundaries under large strain mode

The analysis was re-performed with FLAC's "small strain" analysis mode for both structures. With "small strain" analysis mode the grids are maintained at original shape during the analysis but displacement (and strains) were algebraically accumulated at every analysis step. This allowed the analysis to complete to the desired 300 sec time period (see Figure 2). The analysis results were saved at the end of various critical time periods. For analysis with synthetic waves, the results were saved at the end of 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 170, 200, 250 and 300 seconds. As can be seen in Figure 2 the acceleration amplitudes of the wave before about 20 seconds are insignificant. Also, the acceleration amplitudes gradually recede after 200 seconds.

FLAC RESULTS

FLAC provides different outputs of forces/stresses and displacements/strains results. When the Mohr-Coulomb plasticity model is used, FLAC also provides yield state conditions of different zones. For this analysis, yield states and displacement at various dynamic time steps, and lateral stresses/earth pressure on sheet pile wall and vertical displacements – wharf surface settlements and toe heave at sea bed in front of sheet pile were considered critical parameters for Open Cell wharf structure. Similarly, yield states and displacement at various dynamic time steps, and bending moment and lateral displacement of piles, and wharf surface settlement and toe heave at sea bed are considered critical parameters for Pile Supported Deck wharf structure.

Open Cell Structure

The plots of yield states and displacement and velocity vectors are obtained directly from FLAC. These plots at 50, 100, 150, 200 and 300 second time periods are provided in Appendix A The outputs on lateral stress on Open Cell sheet pile wall, wharf surface settlement and toe heave were obtained in values and plotted with Microsoft excel graphic. These results are also provided in Appendix B. Table 6 provides a summary of analysis results.

Table 6. Summary of FLAC analysis results for Open Cell wharf structure

	Static analysis results	Dynamic analysis results at time period				
		50 sec	100 sec	150 sec	200 sec	300 sec
Maximum lateral pressure on sheet pile (ksf)	4.6	7.5 *(8.6 ksf at 60 sec)*	7.09	6.05	7.04	7.26
Settlement near sheet pile (in) *at the end of dynamic analysis*	-	10.9	18.1	18.9	21.7	21.3
Settlement at the dredge fill end (in) *at the end of different time period of dynamic loading*	-	80			(Over 200 inches) (See Note 3 and plot in Appendix B)	
Toe Heave (in) *at the end of dynamic analysis*	-	11.9	22.1	27.2	33.0	34.6

Note:

(1) All grid displacements (including surface settlements and toe heaves) under static gravity loading were set to zero before starting dynamic analysis. This means the settlements and toe heaves provided in the table include only settlement/heave resulting from Mega thrust earthquake loading. The values do not include static load effects.

(2) The stresses were not set to zero after the static loading. So the lateral stress values provided in in the table are cumulative of static and Mega thrust loading.

(3) Excessive settlement occurred on the dredge fill end because of relatively low values of Young's modulus and Mohr-Coulomb strength parameters. The excessive settlement is also due to the no lateral support available to the vertical boundary under free field boundary conditions.

Pile Supported Deck Structure

The plots of yield states, displacement vectors and bending moments on piles are obtained directly from FLAC. These plots at 50, 100, 150, 200 and 300 second time periods are provided in Appendix C. A history of maximum moment was recorded for the two elements of the outermost pile, Element 19 and Element 22 (See Figure 5) which showed the highest magnitude of moment during the static analysis and also during the initial dynamic analysis. Figure 5 below presents the historical record of the moments with dynamic time steps.

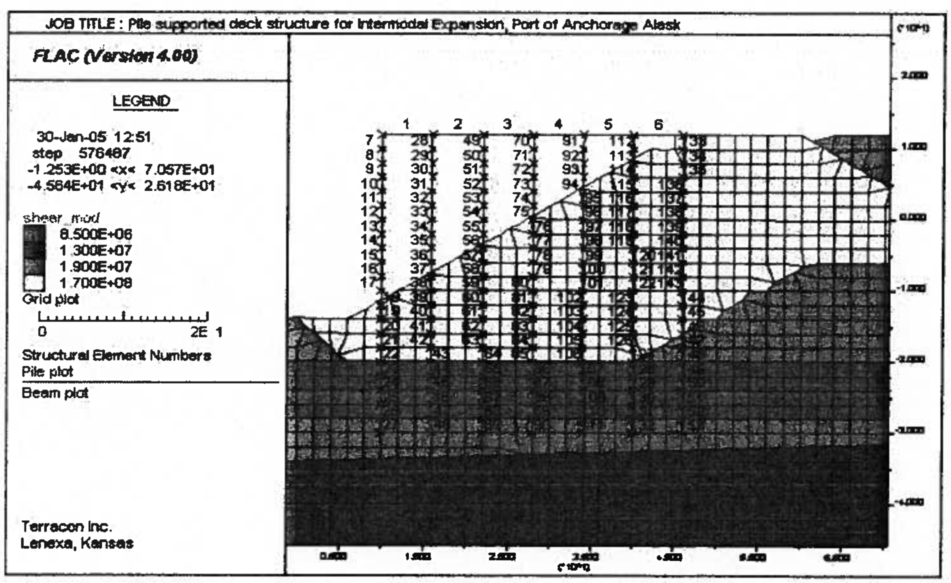


Figure 5. Location of structure elements

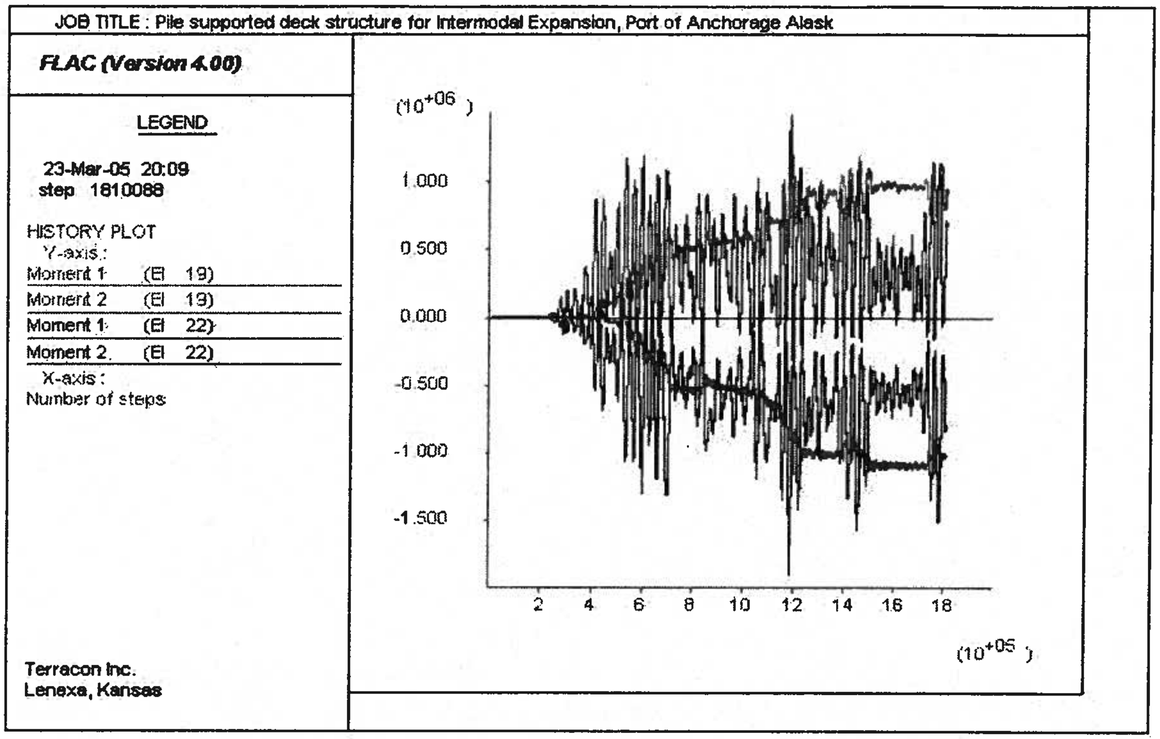


Figure 6. **History of maximum bending moment on selected pile elements during the 300 sec loading period**

The outputs on wharf surface settlement and toe heave were obtained from FLAC output file in values and plotted with Microsoft excel graphic. These results are also provided in Appendix D. Table 6 provides a summary of analysis results.

Table 7. Summary of FLAC analysis results for Pile Supported Deck wharf structure

	Static Analysis	Dynamic analysis results at time period				
		50 sec	100 sec	150 sec	200 sec	300 sec
Maximum bending moment* Nm ft-Kip	7.2×10^3 5.3	Approximately 2×10^6 N-M Approximately 1500 ft-kip At about 200 sec time period (See Figure 6)				
Settlement near the deck in	-	2.2	12.9	23	26.5	29.7
Settlement at the dredge fill end in	-	4	35	(Over 60 inches) (See Note 3 and plots in Appendix D)		
Toe heave (upward) in	-	2.5	34	65	75	87
Maximum pile horizontal * displacement in	-	6.6	9.9	19.2	17.1	18.5

Note: * The calculations of pile bending moments and displacements, the top end of the piles is assumed to be connected to the deck with pin joints. The bottom ends were attached to the finite difference grid of the soil mass.

DISCUSSIONS OF RESULTS

As mentioned in the Notes of Table 6, all grid displacements (including surface settlements and toe heaves) developed at the end of static gravity loading were set to zero before starting dynamic analysis. This means the wharf surface settlements and sea bed "toe" heaves adjacent to the pile discussed below include only settlement and heave resulting from earthquake loading. The values do not include static load effect.

But stresses generated due to gravity loading during the static analysis were not set to zero before the dynamic analysis. The gravity stresses developed at the end of static analysis were carried over by the FLAC program during the dynamic analysis. So the lateral stress values discussed below are cumulative of both static and dynamic loading.

Yield State and Stability

The FLAC outputs plots on yield states and velocity and displacement vectors at selected wave times for different synthetic waves are presented in Appendix A for Open Cell (OC) structure and Appendix C for Pile Supported Deck (PSD) structure. The yield state plots exhibit yielding of a several zones, particularly on dredge fill and around the toe of both OC and PSD structures. Some of the yielded zones come back to elastic state during the dynamic loading when acceleration amplitude is small. The magnitude of maximum displacement vector increased with time. Most of the high displacement vectors are associated with the zones of dredge fill area, zones close to sheet pile for OC and embankment toe and crest for PSD structures.

Lateral Stresses on Open Cell Sheet Pile (OC Structure)

The plots of normal lateral stress on the sheet pile are presented in the Appendix B. As can be seen on graphs of acceleration time histories in Appendix A, the stresses increased with the period of dynamic loading, and generally peak at about 60 sec then varied within a range (but higher than the lateral stress under static loading). The maximum lateral stress recorded was 8.6 ksf at 60 sec.

Bending Moment on Pile Element and Lateral Displacement of Piles (PSD Structure)

As can be seen in the history plot of bending moment on selected pile element in Figure 6, maximum bending moment of a pile element was reached at about 200 sec. Maximum bending moment of 1500 ft-kip was developed on element 22 of the outermost pile located just above the contact of quarry run stone and clay layer 1. Higher bending moments were generally developed on elements located near the contact of quarry run stone and clay layer 1. The higher bending moment at this location is likely due to difference in stiffness (modulus values) of these materials. As can be expected, the lateral displacement of outer pile was higher than the displacements of other piles. Up to about 19 inches lateral displacement occurred at 150 seconds.

Surface Settlement and Toe Heave

The plots of surface settlement and toe heaves are presented in the Appendix B for the Open Cell structure and Appendix D for the Pile Supported Deck structure. Note that the surface settlements and heaves in the plots are the results of seismic loading only. (All displacements and velocities were set zero at the end of static analysis and before application of wave.) The surface settlements were very large near the sheet pile of OC structure and near the deck of PSD structure, **but excessively high** in the dredge fill area of both structures. The large settlement in dredge fill area is due to low stiffness values of the dredge fill as well as lateral spreading of the outer vertical edge which lost the lateral support when free field boundary was applied. Many zones in the dredge fill area yielded and therefore the settlement was excessively high.

Like surface settlement, toe heave close to the sheet pile in OC structure and toe of embankment rapidly increased with wave passing. The toe heave was also excessively high, up to 35 inches near the sheet pile and up to 80 inches near the embankment toe. The toe heave was generally limited to 50 feet off the sheet pile and embankment toe. The toe heave/settlement observed on section close to the left boundary is due to the boundary effect which can be also seen in the plots of displacement and velocity vectors.

LIMITATIONS

The FLAC analysis presented in this report is based on the supplied sectional geometry, soil material properties and sheet pile section. The time history of earthquake acceleration data was provided in 'g' unit; it was converted into m/sec^2 to input into FLAC program. The value of damping ratio D was selected to be 5% based on Figure 7 and 8 of the report "Port of Anchorage Seismic Site Response Study" developed by Dr. Youssef Hashash, dated April 22, 2004. All analyses were carried out using 5% damping ratio.

The present analysis has the following limitations and should be carefully considered in interpreting the analysis results:

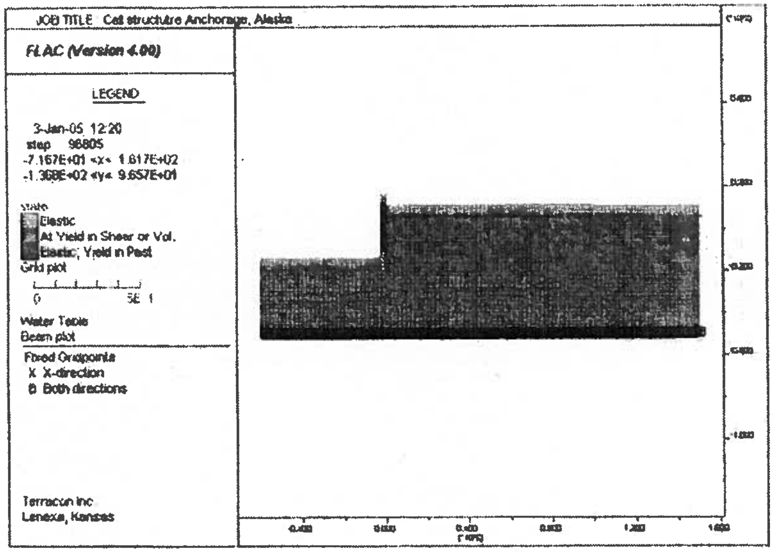
1. The analysis was performed with FLAC 2-D model using plane strain condition. The curved shape of the sheet piled Open Cell structure would develop circumferential stresses that provide lateral support to the sheet pile. This could not be modeled with the 2-D plane strain condition. Similarly, the discrete nature of individual piles for Pile Supported structure was analyzed by approximating to continuous section to utilized plane strain analysis methodology. It is recommended that three dimensional analyses be carried out to take into the effect of such circumferential stresses in Open Cell section and to eliminate error associated with the transformation of discrete piles to plan strain condition.

2. The size of FLAC grid considered in the analysis is 2m by 2m. This may be a reasonable grid size for a static analysis of the present wharf structure. However, accuracy of dynamic analysis may be limited with 2m by 2m grid size because of high frequency of the ground motion. It is recommended that at least one set of analysis be performed with 1m by 1m grid and accuracy of the result from 2m by 2m grid be verified.

3. Local damping parameters were used in this preliminary analysis for simplicity. FLAC manual suggests to use Rayleigh damping parameters be used for complex analysis.

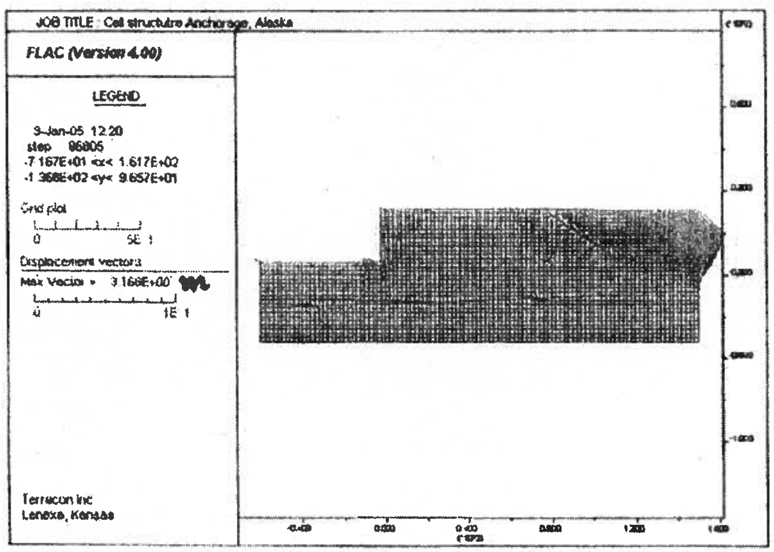
4. The dynamic analysis performed in this FLAC analysis did not account for the hydrodynamic effects/pressure. Only the static water pressure was applied on the sheet pile in both static and dynamic analyses.

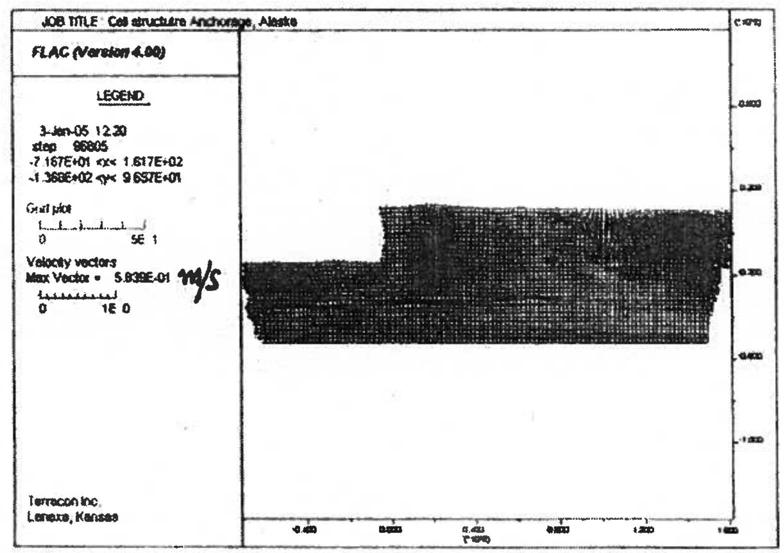
APPENDIX A
OPEN CELL STRUCTURE
Yield States, Displacement and Velocity Vectors



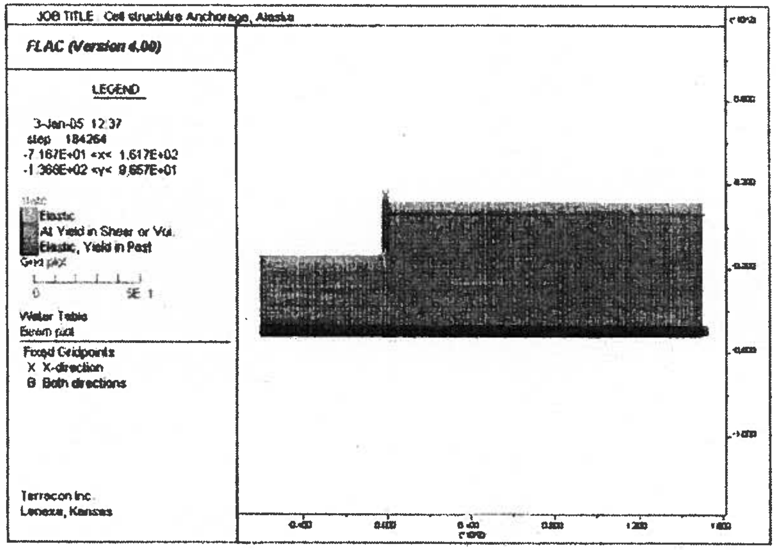
OPEN CELL

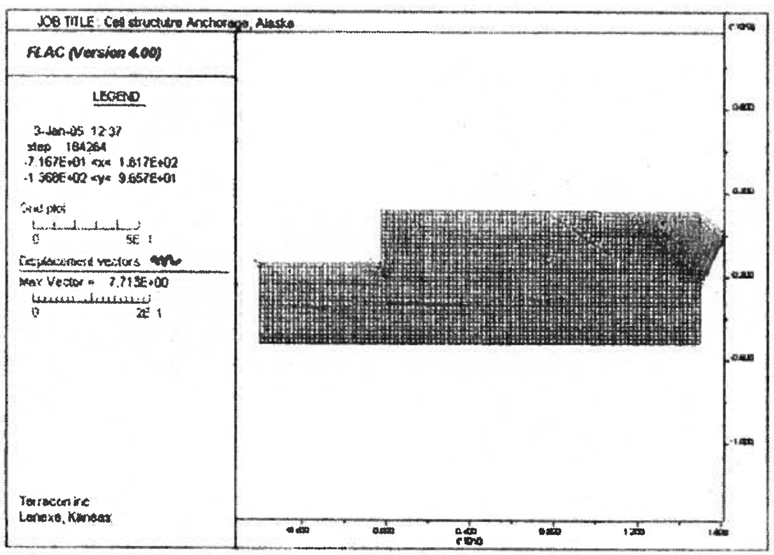
After 50 SEC

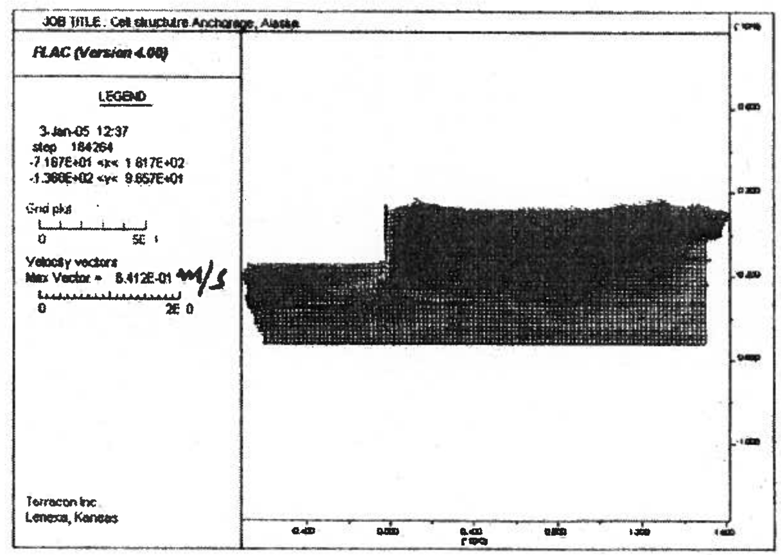




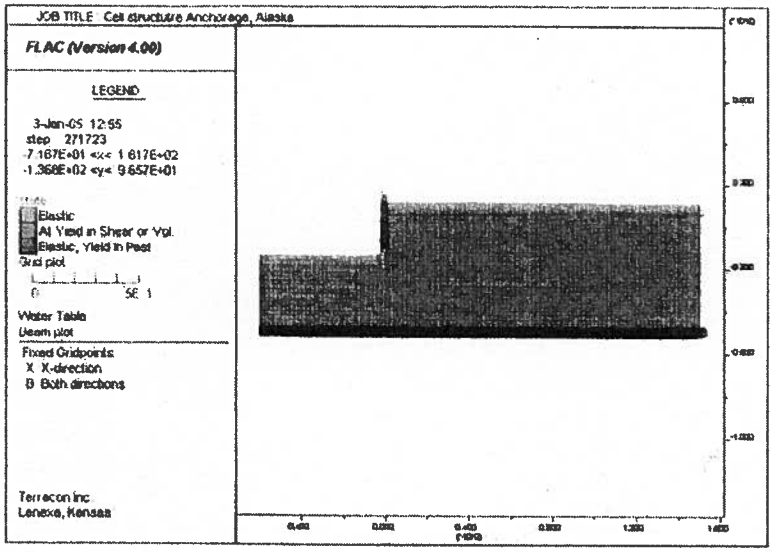
OPEN CELL
After 100 Sec

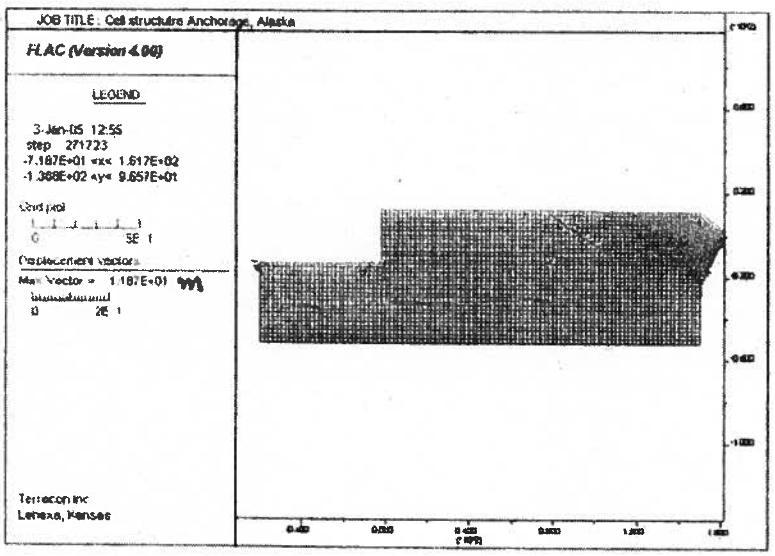


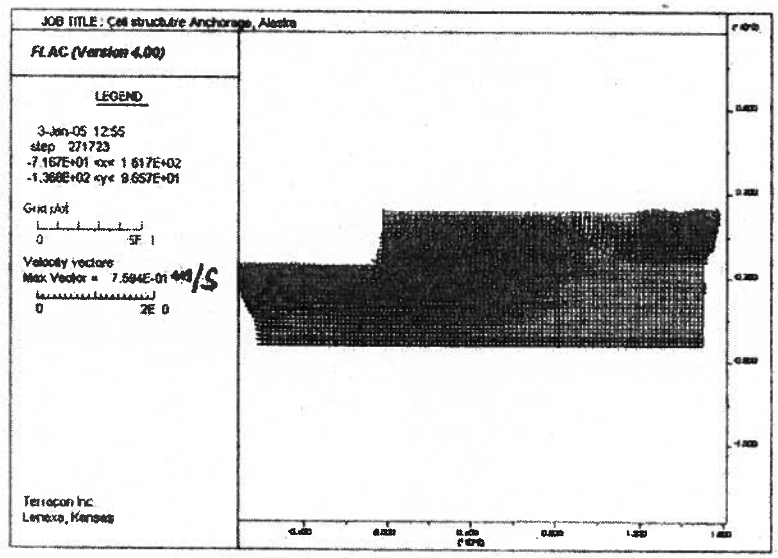


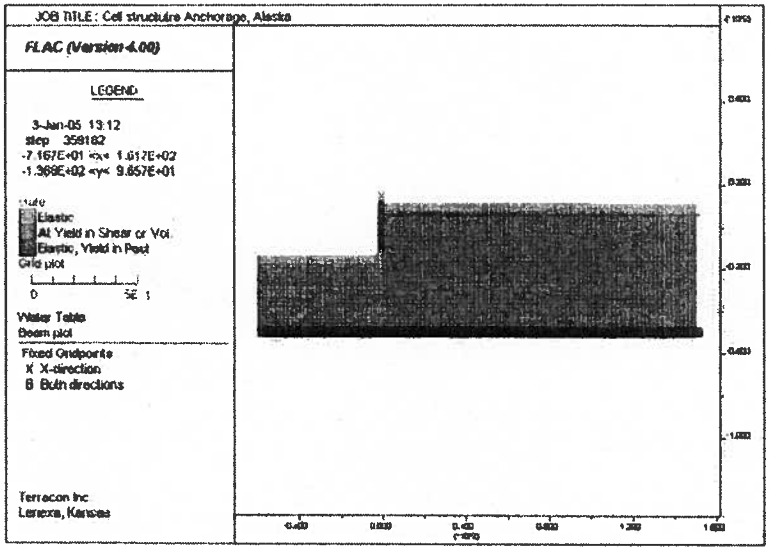


OPEN CELL
After 150 Sec

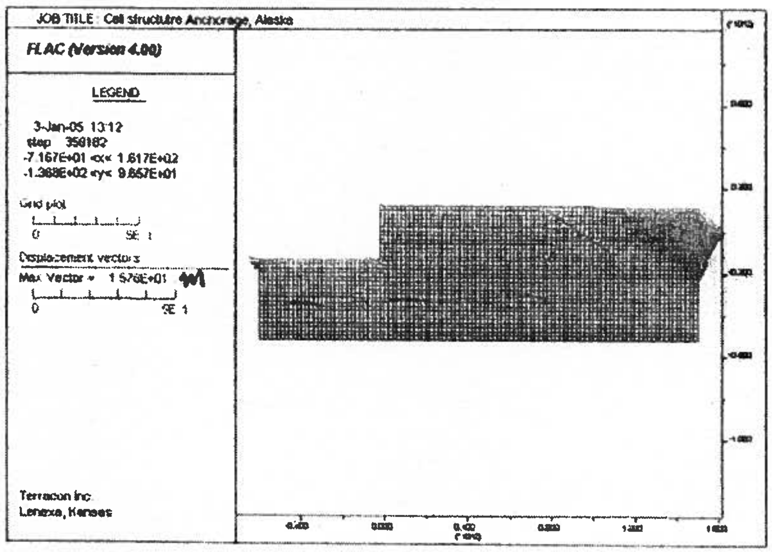


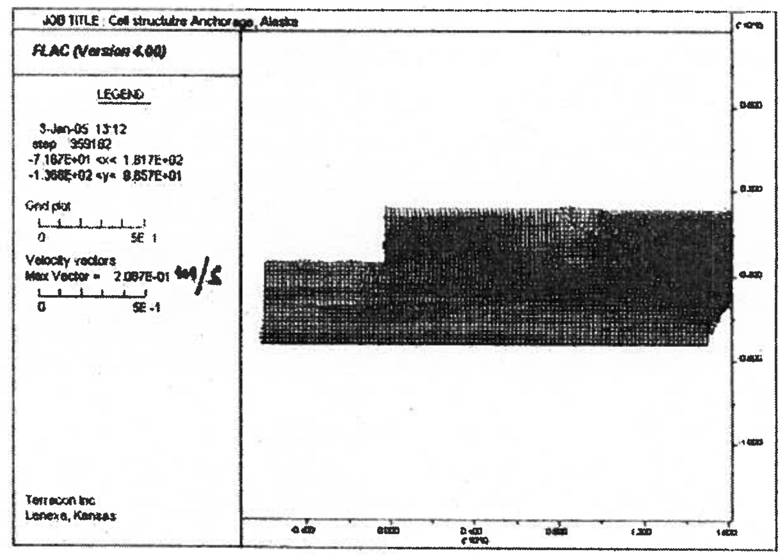




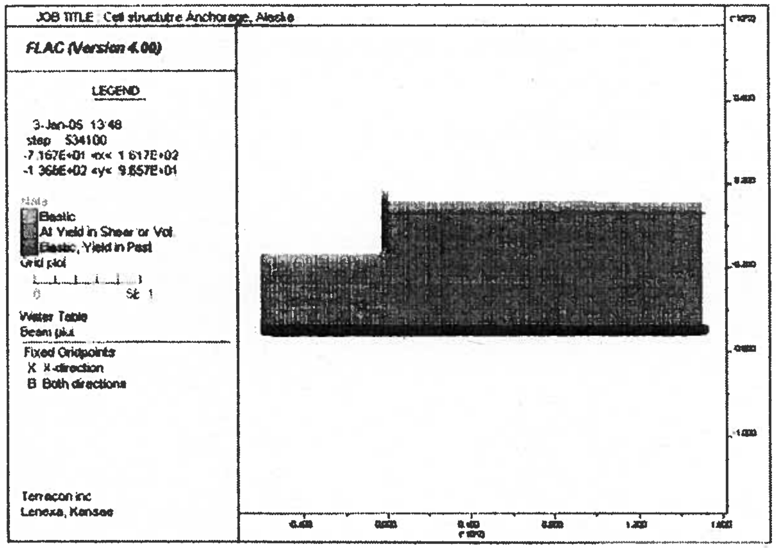


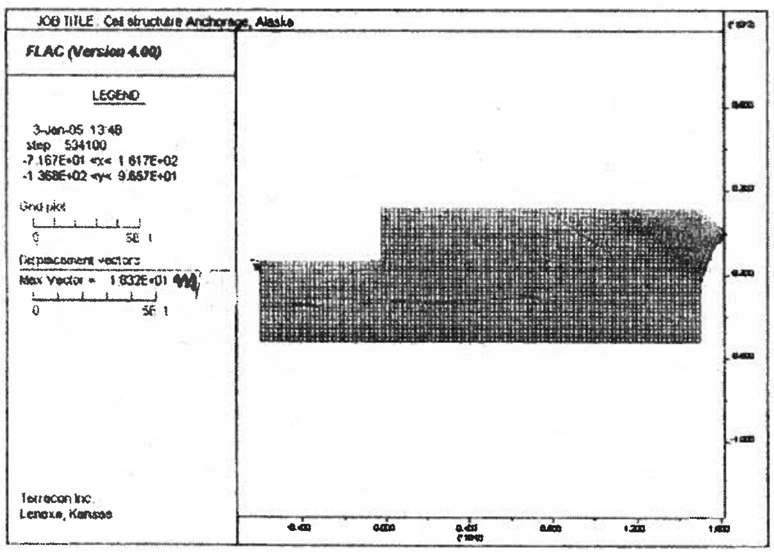
OPEN CELL
AFTER 200SEC

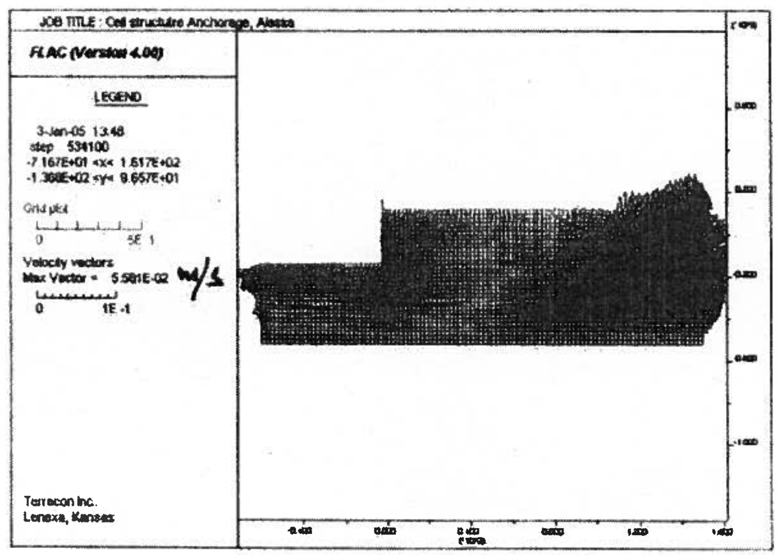




OPEN CELL
AFTER 300SEC

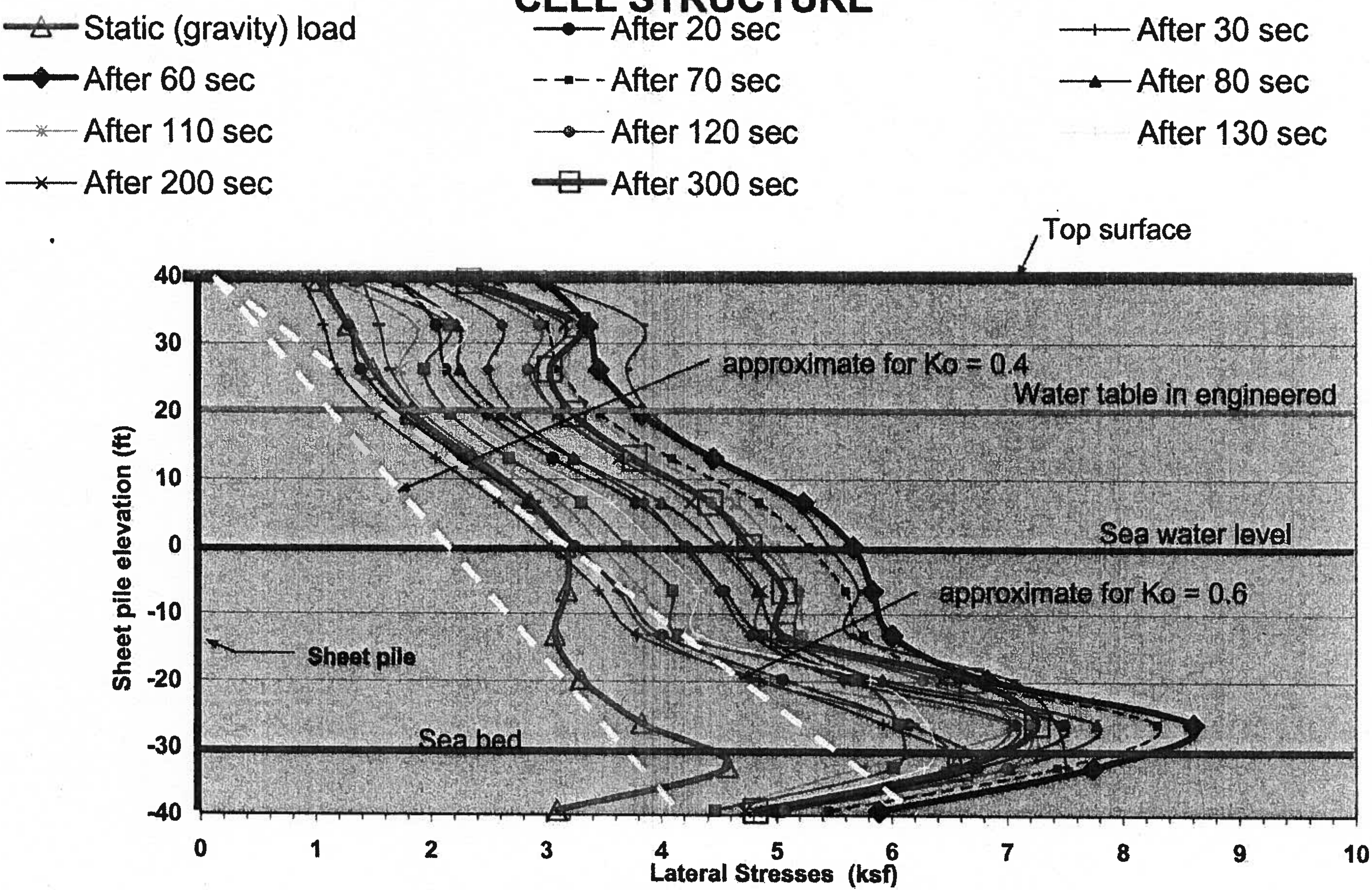




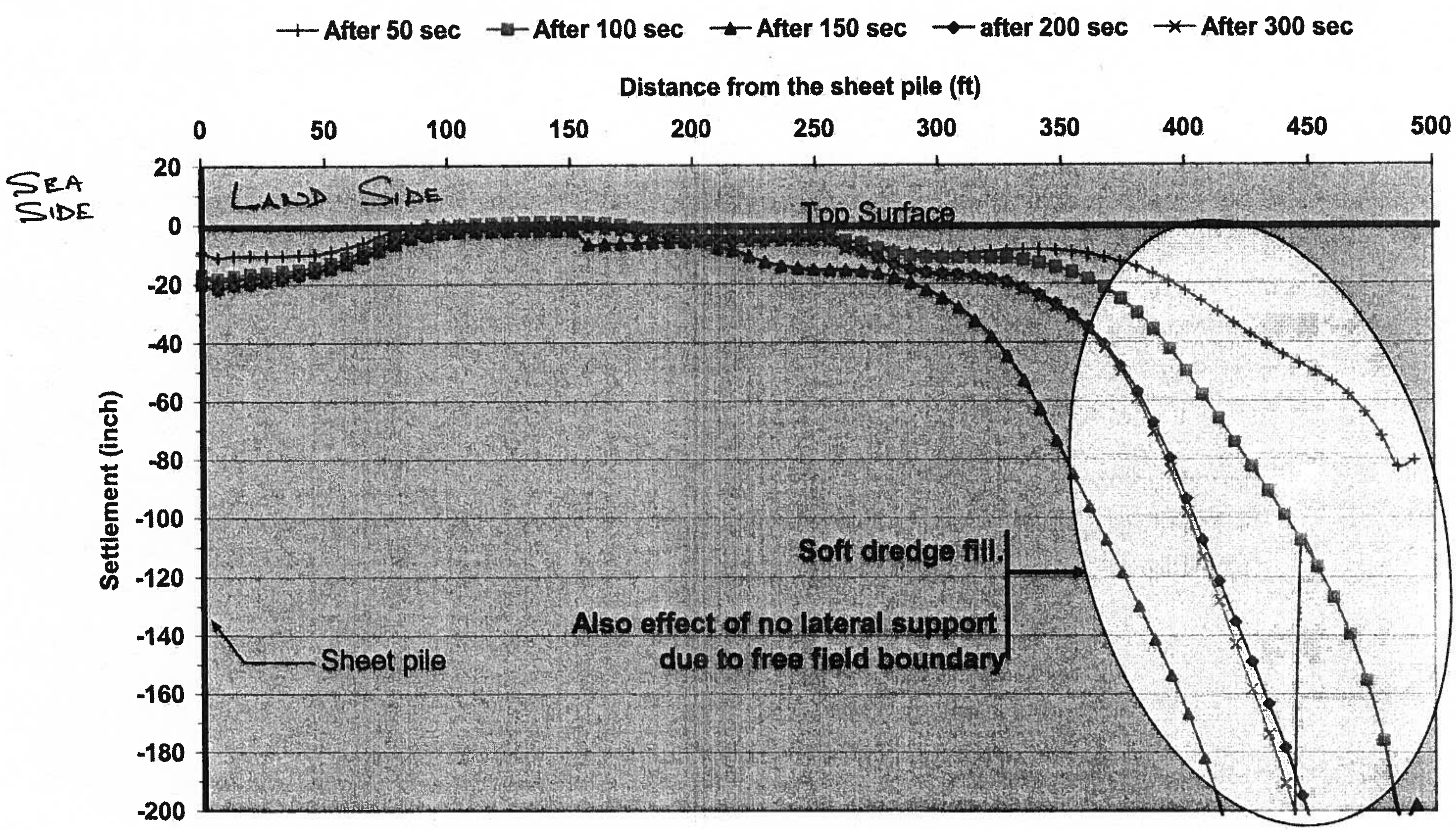


APPENDIX B
OPEN CELL STRUCTURE
Lateral Pressure, Settlement and Toe Heave

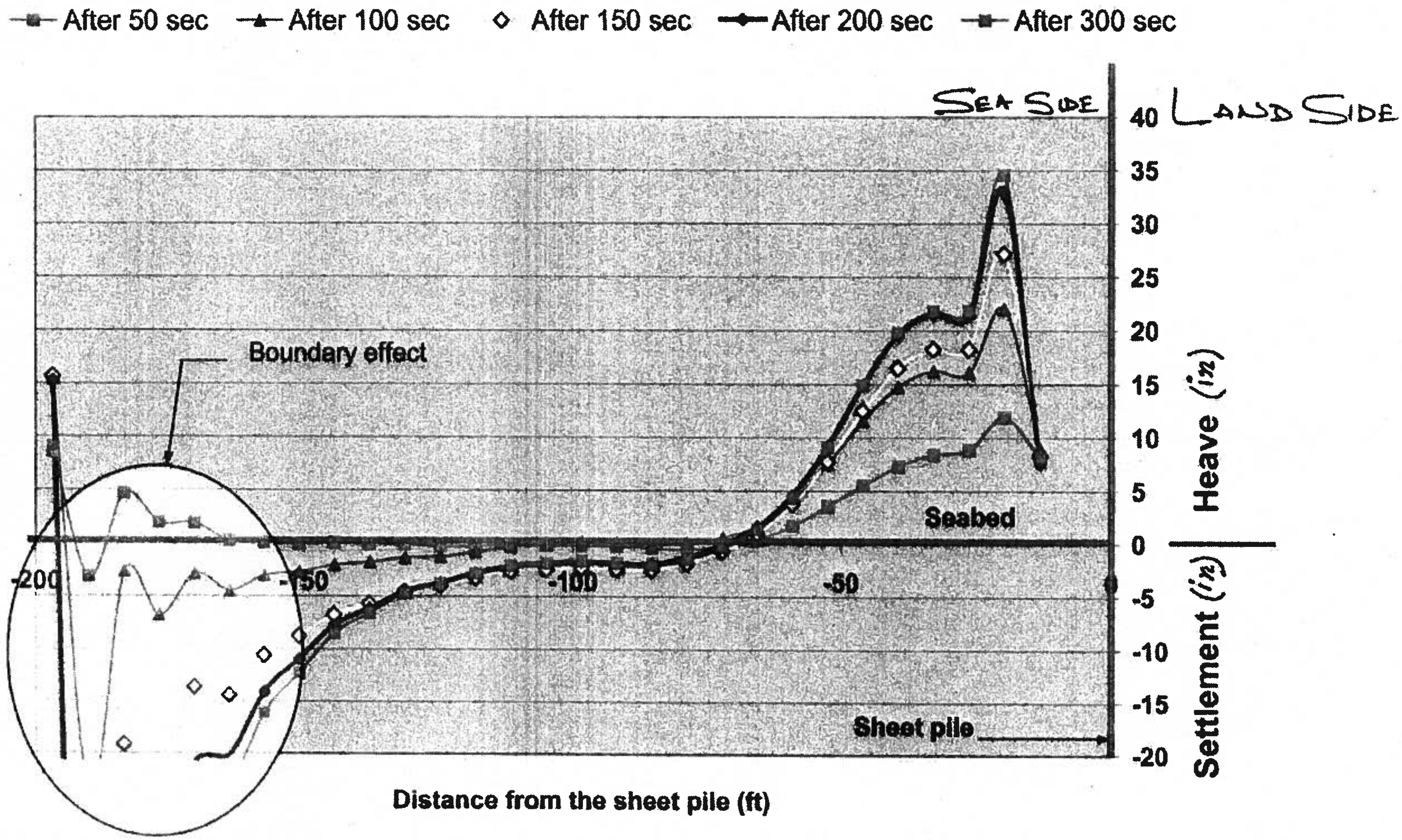
LATERAL EARTH PRESSURE ON SHEET PILE - OPEN CELL STRUCTURE



SURFACE SETTLEMENTS
OPEN CELL STRUCTURE
(excludes settlement due to gravity loading)



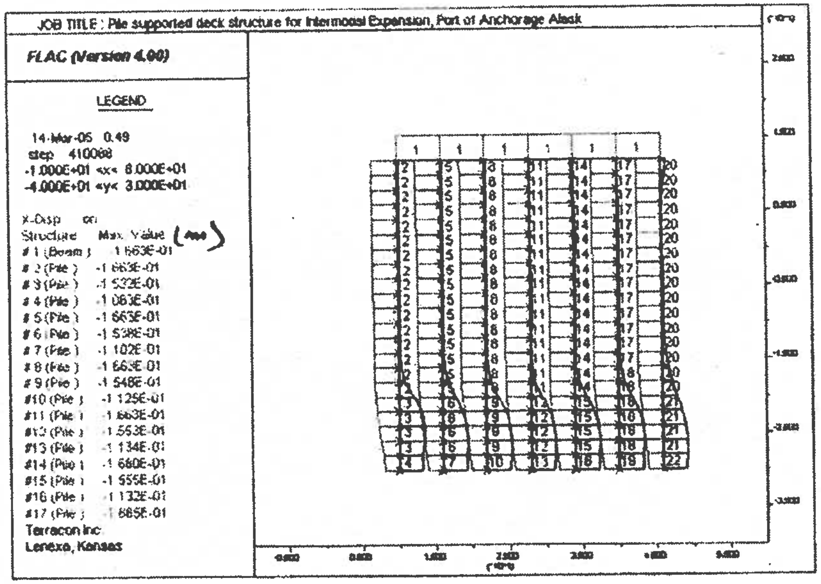
SEABED HEAVE/SETTLEMENT
OPEN CELL STRUCTURE

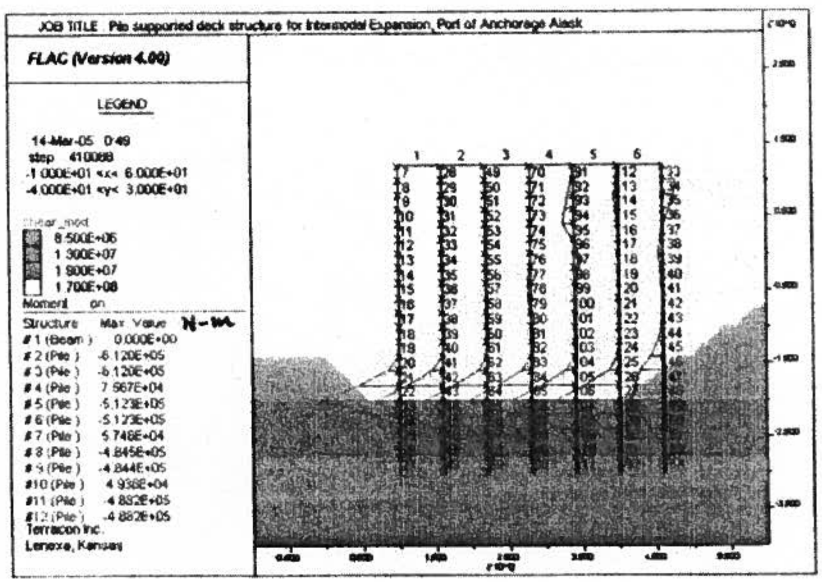


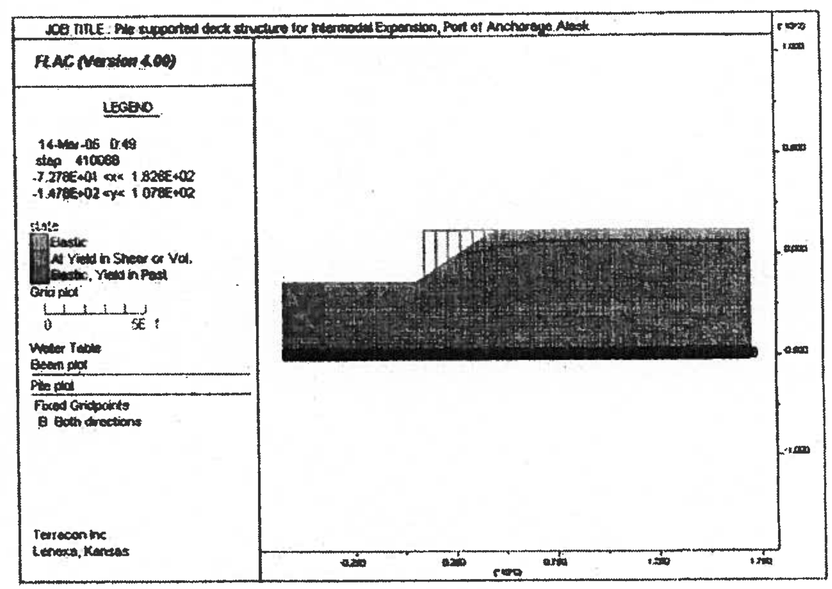
APPENDIX C
PILE SUPPORTED DECK STRUCTURE
Yield States, Pile Bending Movements and Displacement Vectors

PILE SUPPORTED DECK

AFTER 50 SEC







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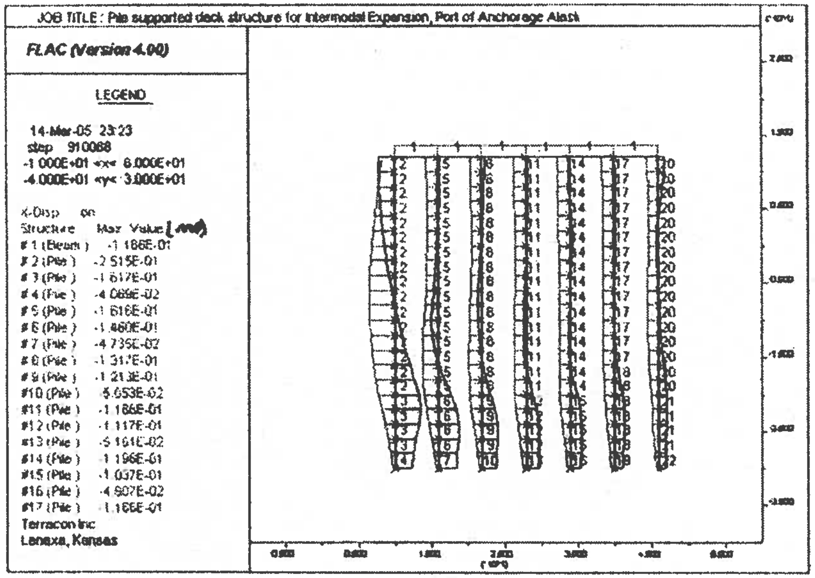

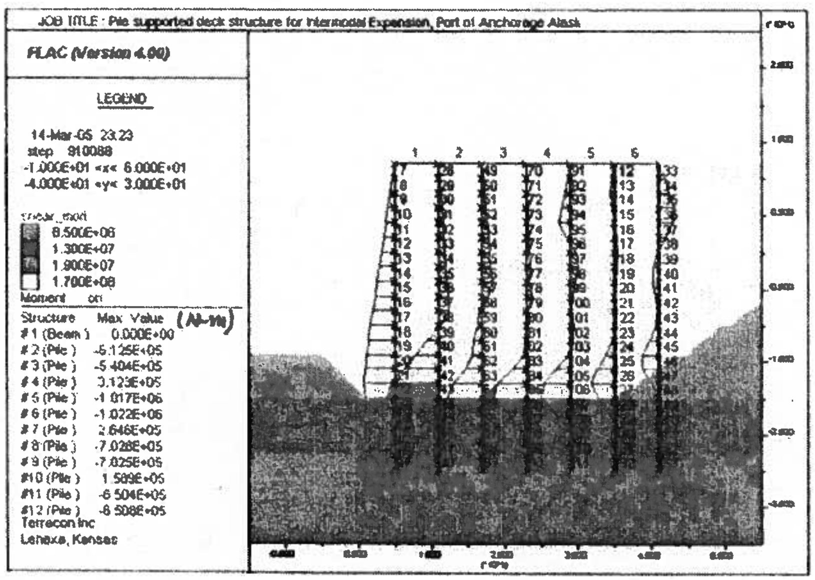

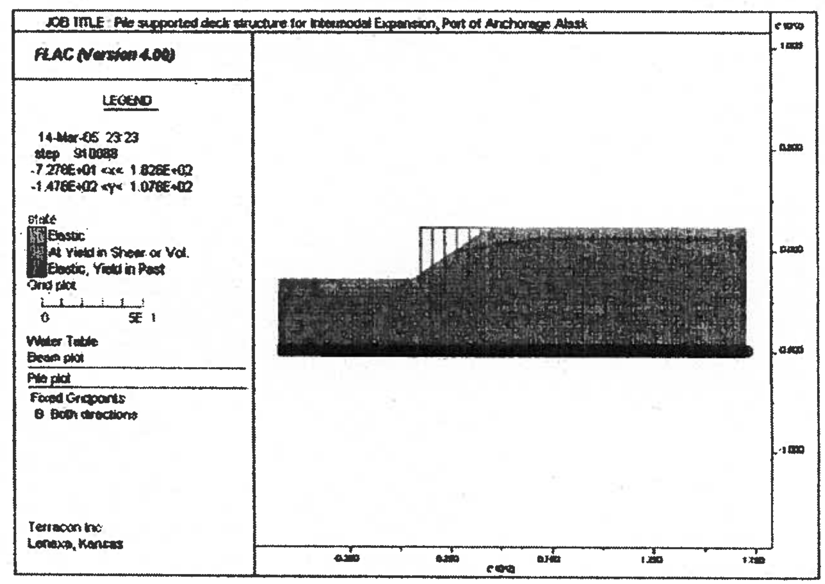

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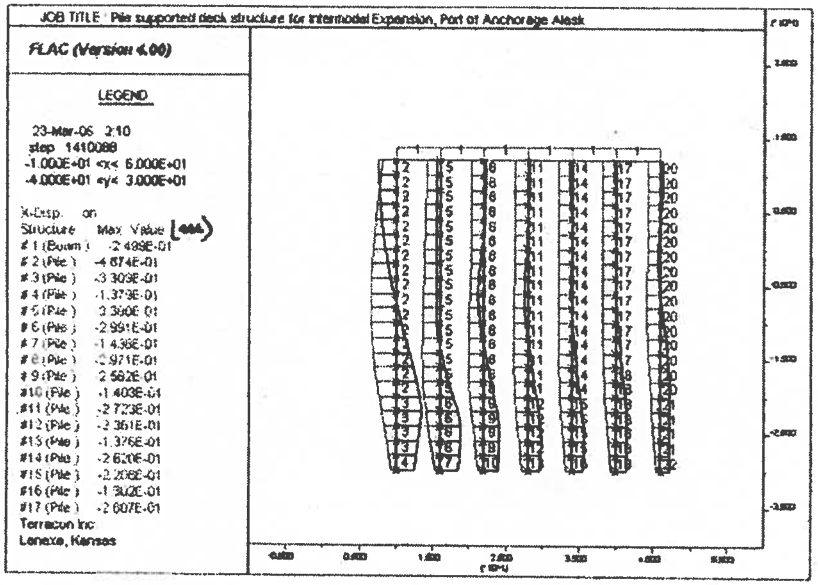

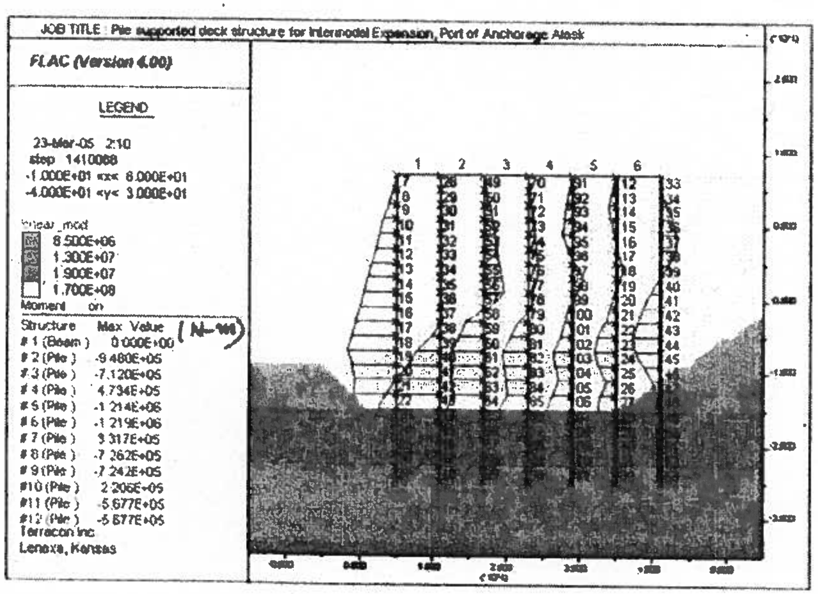

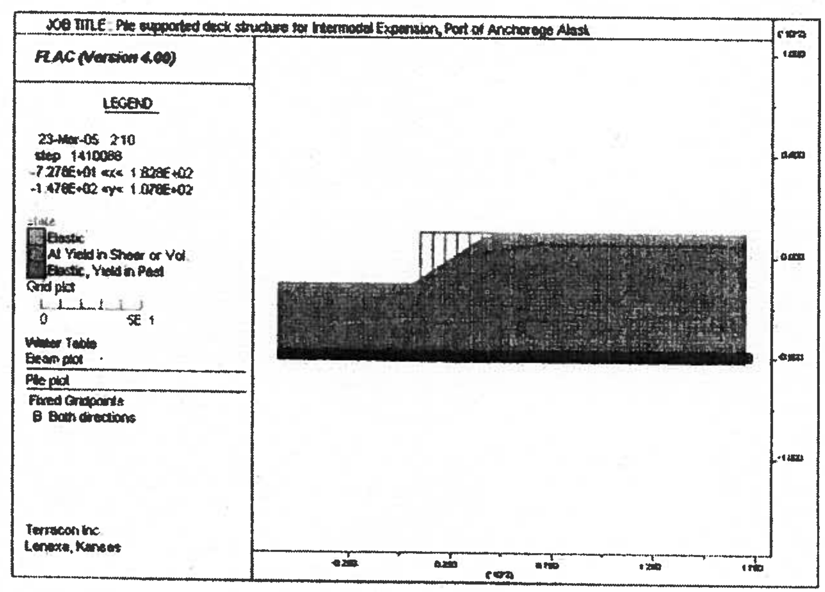

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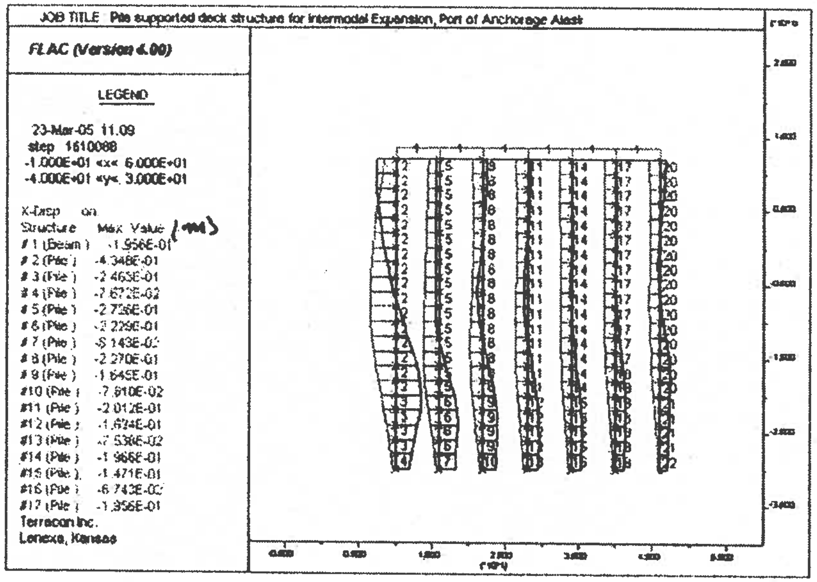

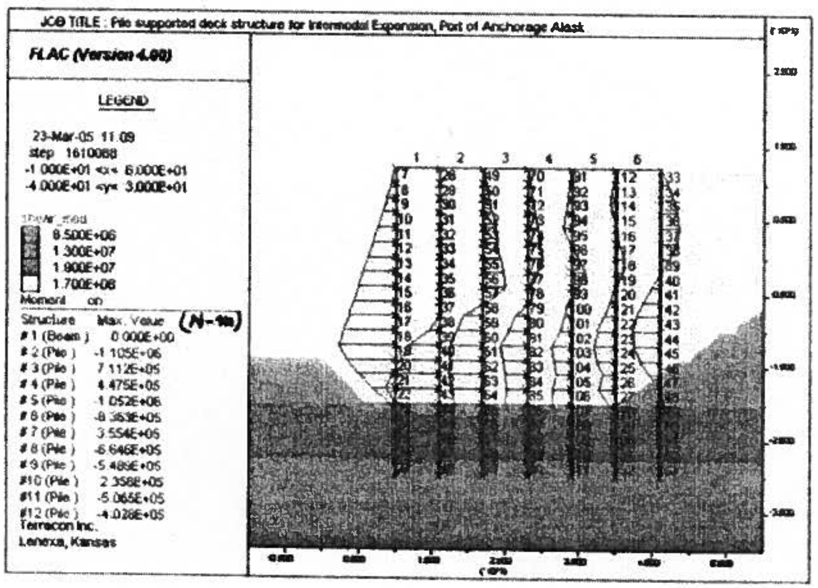

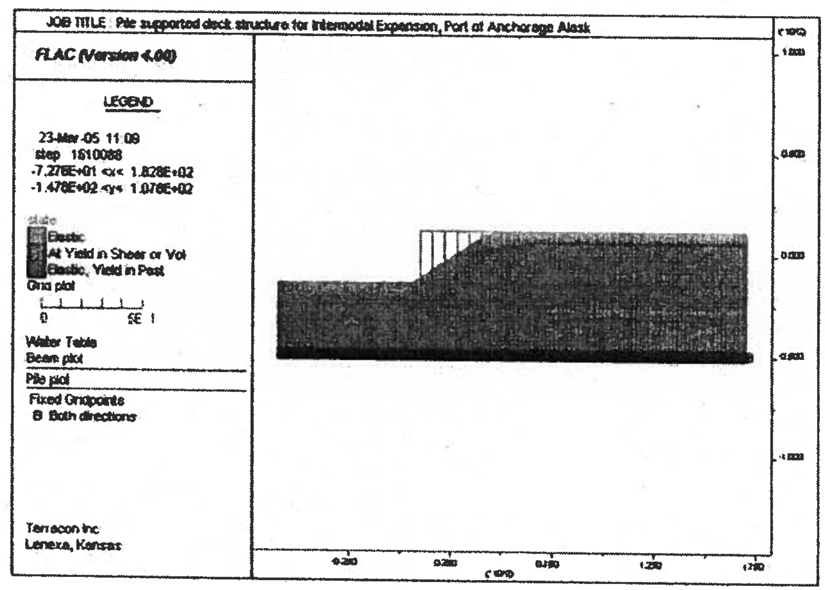

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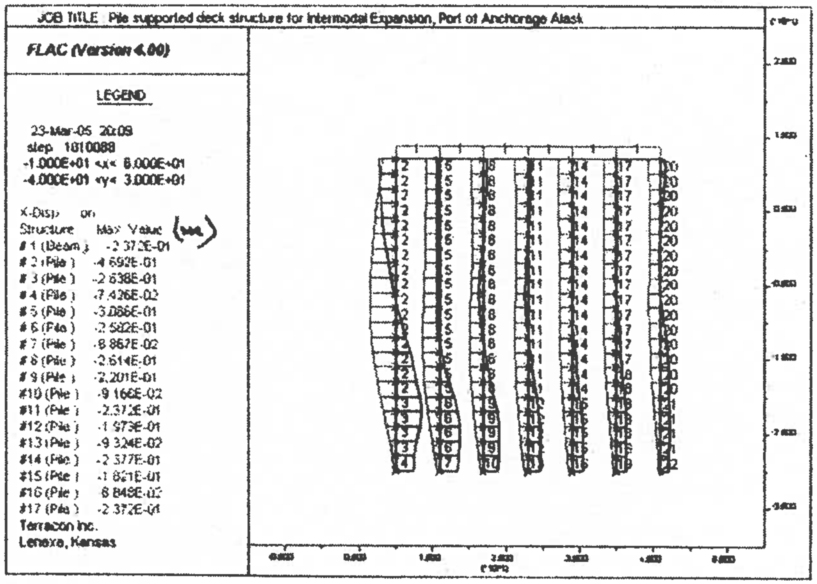
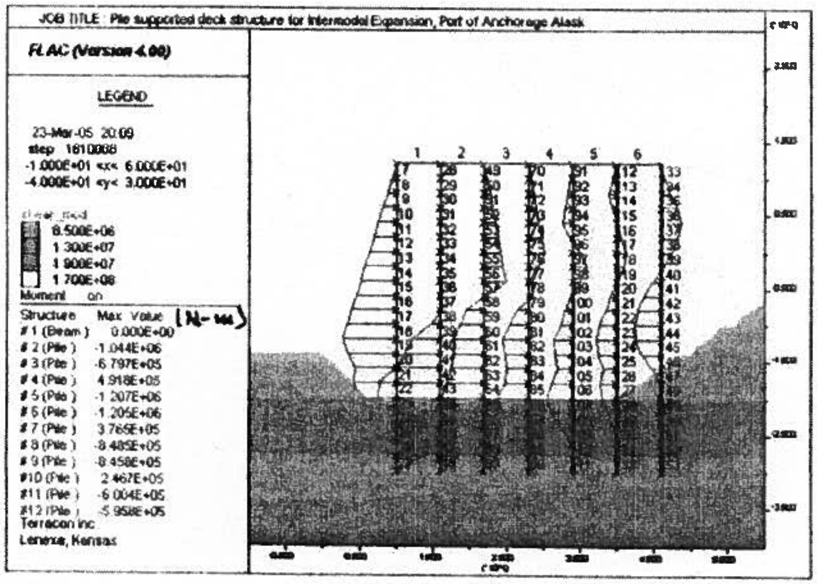
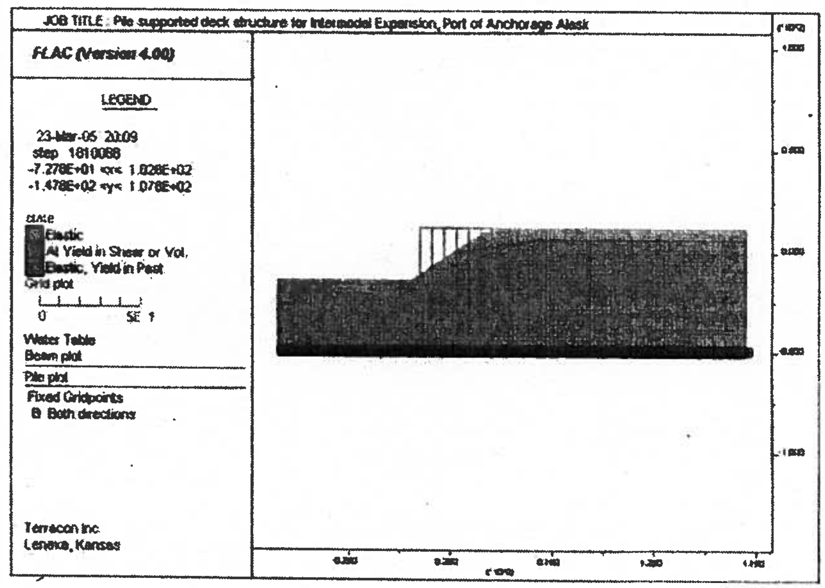
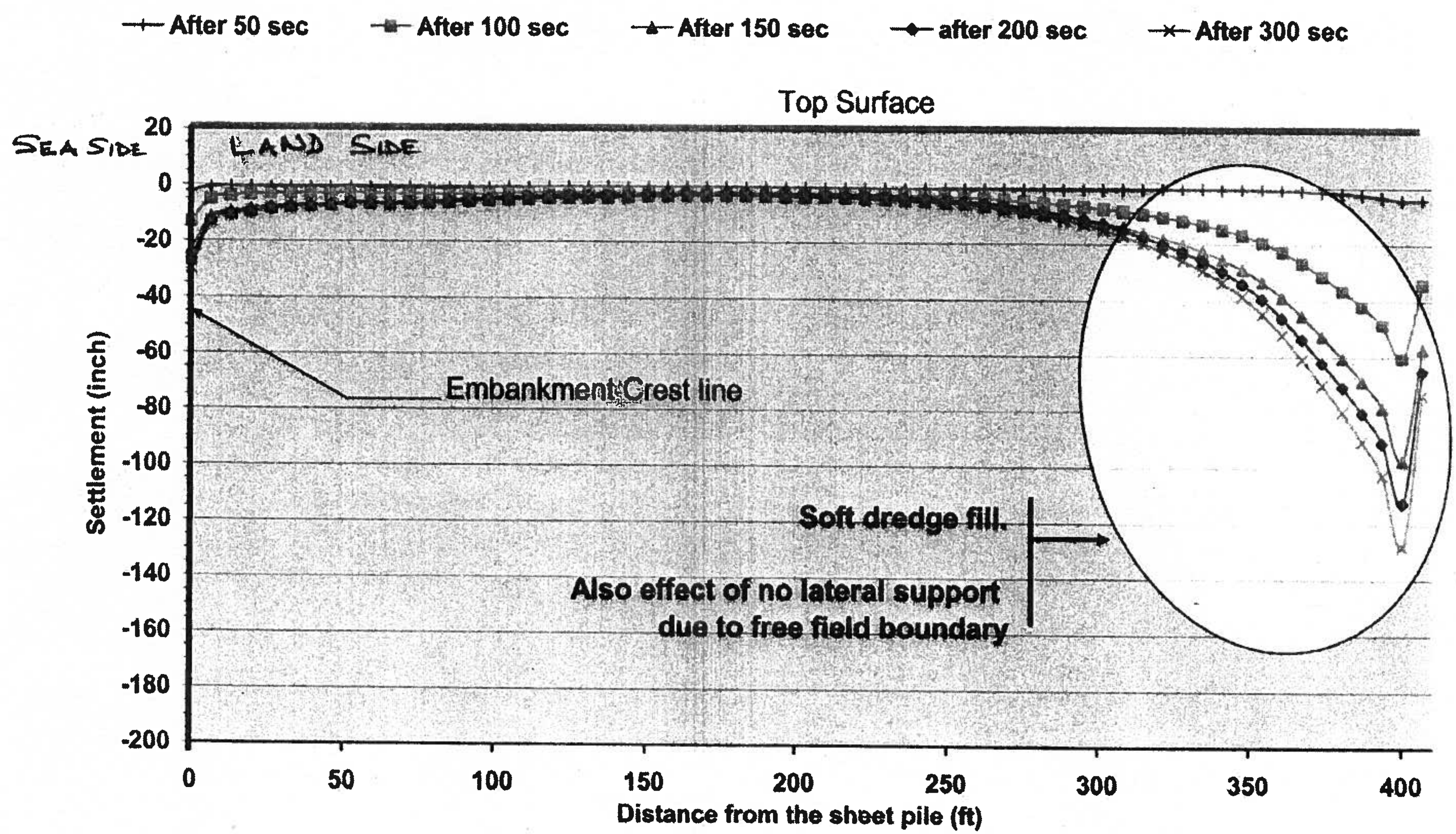




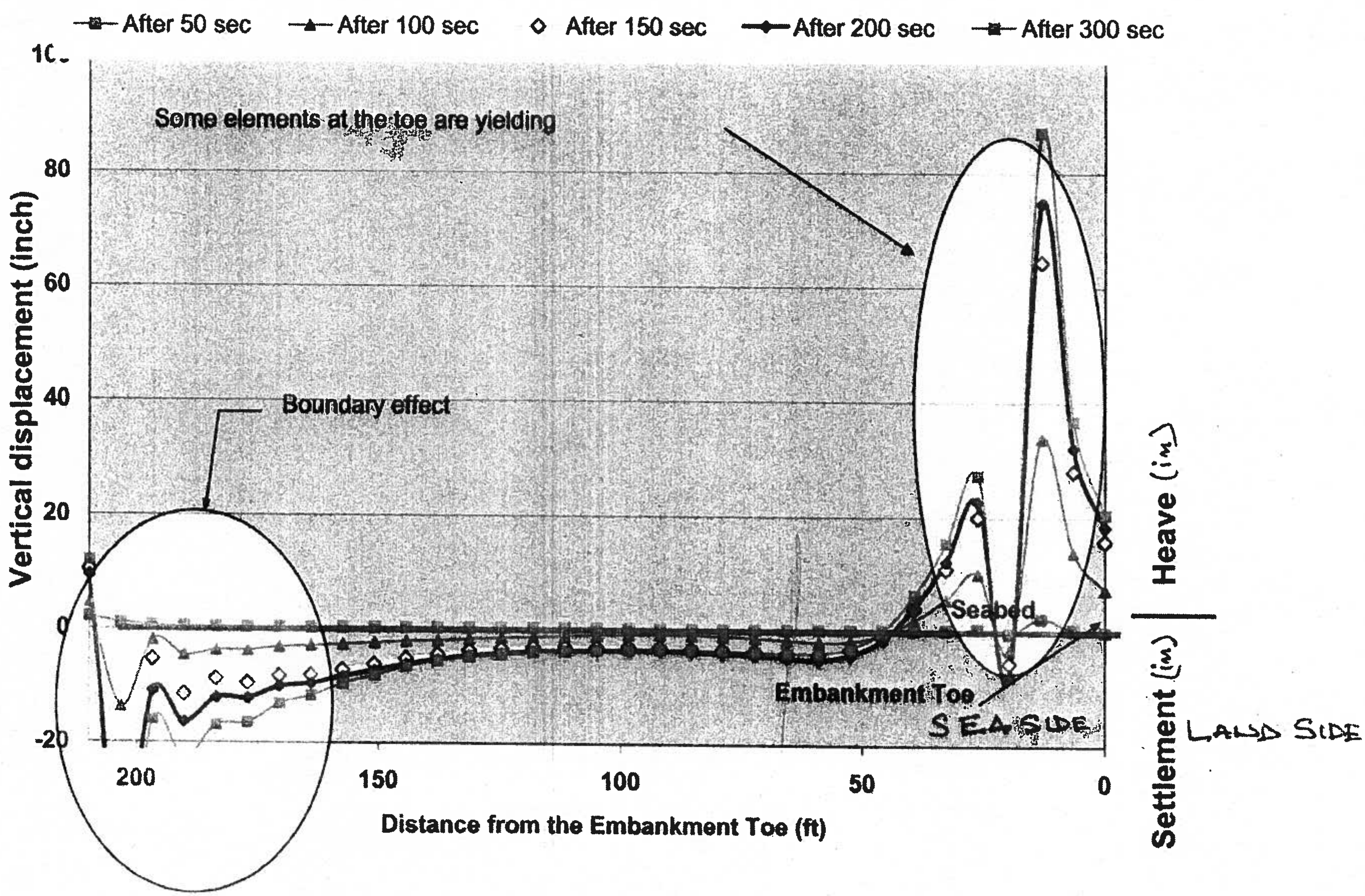


APPENDIX D
PILE SUPPORTED DECK STRUCTURE
Surface Settlement and Toe Heave

SURFACE SETTLEMENTS
PILE SUPPORTED DECK STRUCTURE
(excludes settlement due to gravity loading)



SEABED HEAVE/SETTLEMENT ON THE LEFT OF EMBANKMENT TOE (Refer Figure 1B)
PILE SUPPORTED DECK STRUCTURE



Port of Anchorage Expansion Project
35 % Design Review
Prepared for the U.S. Army Engineer District, Alaska
By the
U.S. Army Engineer Research and Development Center
Geotechnical and Structures Laboratory
Vicksburg, Mississippi
December, 2006 (Revised 22 December 2006)

Background

At the request of the U.S. Army Engineer District, Alaska (CEPOA), a team of geotechnical engineers from the Geotechnical and Structures Laboratory (GSL), U.S. Army Engineer Research and Development Center (ERDC), conducted a review of 35% design documentation provided by CEPOA that details plans and analyses in support of a large expansion of existing port facilities at Anchorage. The ERDC team consisted of Dr. Joseph Koester, Mr. Donald Yule, Mr. Daniel Leavell and Mr. Ron Wahl. Each of the team members participated in reviews of design and performance of a facility recently constructed at Port Mackenzie, on the opposite shore of the Knik Arm and just to the northwest of the proposed Port of Anchorage Expansion. The principal component of both facilities is an Open Cell Sheet Pile (OCSP) structure; the proposed structure at the Port of Anchorage represents an unprecedented application of the OCSP technique in terms of its areal extent and the height of its seaward face.

Materials provided to the ERDC team by CEPOA included a binder containing project design documents at the 35% level, reports and test data on field and laboratory efforts conducted to date to characterize the geotechnical properties of site soils, reports of computational analyses on the anticipated behavior of the proposed facility both under static and dynamic (earthquake) loading, and various correspondence among project stakeholders and the construction companies responsible for design and fabrication. In addition, CEPOA provided reports and test data not included in the binder in response to questions raised by the ERDC team during the review. Materials were sufficiently inclusive of all relevant activities to support the review.

CEPOA representatives traveled to ERDC on two occasions to meet with the review team members to assist the ERDC team with interpretation of project documentation and to manage expectations for the review. The second of these meetings took place on 13 November, consequent to which minutes and interim findings were transmitted to CEPOA; this report includes and expands on those minutes. The ERDC review was conducted based on the project's nominal 35% design level with particular attention to design criteria, engineering approach, and engineering analyses results to date. The reviewers did not re-run numerical models to validate results by the several engineers subcontracted to that purpose, or to reinterpret particular calculations or specific quantitative engineering results nor aspects such as engineering properties. The review objective was to determine if the structure could suffer structural damage or failure during a seismic event as a result of Corps of Engineers construction or

EXHIBIT W

maintenance dredging operations. As the project is at a 35% design level, the ERDC team offers the following recommendations to improve continuing design analyses and question possible oversights in the execution of such a complex and important project. Representing the Corps of Engineers as a stakeholder in this process, the reviewers raised issues for consideration and resolution.

General Comments

The Port of Anchorage (POA) expansion project as currently envisioned comprises significant infrastructure, and poses many engineering design and construction challenges - especially with respect to the regional seismic hazards that affect design. The POA expansion will not only greatly enlarge but will also replace the entire existing docking facilities. Operation of this port is critical to regional economy, national defense, and for potential use in disaster response and recovery operations. The stakeholders will expect that it perform optimally in all these aspects. The best solution strategy will use informed and clear risk-based decisions that will balance economics, performance, environmental impact, and safety. Thorough engineering analysis, coupled with stakeholder participation, is the approach that will be successful in both the short and long term for managing expectations.

The Corps is a stakeholder in this project as the steward of our nation's navigation infrastructure. More specifically, the Corps of Engineers dredging mission must be compatible with the port facility, so that they work together without any mutually significant negative impacts. Also, the importance of this facility and its use in disaster recovery operations is another aspect the Corps represents as a stake-holder. Designation of Anchorage as a National Strategic Port is one of the factors that has led the stakeholders to require part of this port to perform as an essential facility.

The ERDC team finds in general that the engineering processes conducted to date represent a thorough approach to develop a design based on site-specific engineering properties at a level commensurate with a 35% design level and the project importance. The field exploration program conducted by ICRC in 2003 provided an excellent basis for the current design analyses. Advanced geotechnical laboratory testing, soil mechanics analyses, and numerical modeling were conducted to provide engineering insight into the design.

Review Process

The ERDC team focused on three principal aspects of the project design: geotechnical site characterization efforts, including field explorations and laboratory soils testing; numerical modeling of the static and dynamic stability of the OCSP structure, both internally and globally; and seismic hazard evaluation as reported. Reviewers considered each aspect separately initially, but team findings were based on coordination of all features to the extent possible.

Review Findings

Geotechnical Site Characterization

The procedures followed for soil sampling and testing of the foundation are believed to conform to best practices. The acquisition of soil samples from barge equipment in the turbulent waters and tide conditions of the Knik Arm is a remarkable accomplishment. The ERDC team did not identify deficiencies in laboratory or field testing procedures for engineering property measurements for in situ materials at the Port. However, the proposed borrow materials were not tested to confirm whether they meet design assumptions as modeled. This needs to be done in support of subsequent re-analysis and final design.

Stability Evaluation

The report by Terracon dated September 26, 2004 provided to the ERDC team is a well prepared and thorough engineering document on the design and analysis of the Open Cell Sheet Pile structure proposed for the Port of Anchorage Expansion Project. Nonetheless, there are a few concerns listed in following commentary below that should be addressed in subsequent studies.

I. Static Global Stability.

A. The design criteria for global stability are not tied to any well-established guidelines such as those applied by the U.S. Army Corps of Engineers (USACE), the American Association of State Highway and Transportation Officials (AASHTO), or the Naval Facilities Command (NAVFACS). The target factors of safety for these organizations are compared with those recommended for design in the Terracon report on global stability and the PN&D criteria sheet in Table 1, below. In the Terracon report, the immediate and short-term strength conditions correspond to the end-of-construction loading case in Table 1.

Table 1. Minimum Global Factors of Safety for Earth Structures of Different Agencies

Agency	Minimum Factors Safety Factors for:	
	End of Construction	Long-term
USACE	1.3	1.5
AASHTO	1.3	1.5
NAVFACS	1.3	1.5
Terracon/PND for Anchorage Port Expansion	1.2	1.5

The table shows that the minimum end-of-construction safety factor of 1.2 recommended for use for the Anchorage Port Expansion is unconservative when compared with the values recommended by the USACE, AASHTO and NAVFACS. The recommended minimum long-term factor of safety for this project is 1.5, which is consistent with the values in the guidelines for the three agencies. Adherence to some well-established guidelines is especially important to this project, in view of the fact that performance of large OCSP structures is not well documented. The Port of Anchorage Expansion Project should be executed in accordance with well-established guidelines to account for uncertainties and to minimize the risk of failure.

B. The water level in front of the OCSP structure used for the 35% design was 0.0 MLLW. Use of this (mean) design water level is unconservative, because it is certain that the water level will be lower than 0.0 MLLW on a periodic basis. The lowest observed water level in the in the area was -6.4 ft MLLW. In final design, the OCSP structure should be analyzed for a more extreme water level, lower than 0.0 MLLW for the immediate, short and long-term cases. The 0.0 MLLW water level for the seismic cases would be appropriate because the joint probability of having the Extreme Low Water Level and the OLE, CLE or MCE earthquakes is very low.

C. The mudline in front of the OCSP structure should include an allowance for 6 ft of overdredging. This is based on 2 ft of advance maintenance dredging, 2 ft paid overdredge allowance and an additional 2 ft allowance for scour or incidental overdredging. There have been pockets of scour exceeding 2 ft observed over a single winter period. Thus, the mudlines used in the global stability analyses for each of the five areas investigated are unconservative, as they were conducted with an allowance for only 2 ft of overdredging. The mudlines relevant for the design for each area are listed in Table 2. The analysis for Areas 1-6 should be consistent in modeling approach and assigned properties unless significant differences are warranted and documented.

Table 2. Mudlines for OCSP Analysis

AREA	Target Mudline after dredging	Mudline used in Terracon's global stability analysis with 2-ft overdredge tolerance (scaled from drawings)	Mudline recommended by COE for final design analysis with 6-ft overdredge tolerance
Area 1	-35	-21	-41
Area 2	-45	-48	-51
Area 3	-45	-48	-51
Area 4	-45	-48	-51
Area 5	-45	-40	-51
Area 6	-38	*	-44

D. The results of the global stability analyses from the Terracon report for immediate, short term and long term conditions are presented in Table 3, below for Areas 1 through 5. The factors of safety for Area 6 were not reported. The global factors of safety were computed using the 0.0 MLLW water level and the mudlines with a 2-foot overdredge allowance.

Table 3. Computed Global Factors of Safety from Terracon Analysis of September 24, 2004			
	Condition		
Area	Immediate	Short Term	Long Term
Area 1	1.389	1.257	1.983
Area 2	1.260	1.189	1.923
Area 3	1.384	1.315	1.841
Area 4	1.084	1.007	1.749
Area 5	2.209	2.185	1.970
Area 6	Not reported	Not reported	Not reported

Highlighted values reflect factors of safety that did not meet the project's minimum target values. The computed factors of safety show that Area 4 is the most critical of the six project areas, because the global stability does not meet the minimum factor of safety targets for the immediate and short term analysis conditions. However, the safety factors for Areas 1 through 5 exceeded the target levels for the long term condition. The Area 5 decrease in factor of safety progressing from immediate to long term conditions is unexpected and if correct should be explained. Estimates from consolidation tests predict that it will take from one to three years from the onset of construction until long term strength conditions are achieved. The progress of consolidation and subsequent strength increase can be monitored with instrumentation that would include piezometers and settlement plates to insure that the fill in the OCSP is not installed too quickly. Additionally, controlling the rate of construction and the installation of strip drains might be useful in insuring the global stability of the project, particularly with respect to Area 4. The search grid employed for determining the minimum factor of safety resulted in centers on the search boundary and therefore cannot conclude if they are minimum.

II. Static Internal Stability

The internal stability of the project, considering the pull out resistance that may be developed from tail walls was analyzed under the presumption that the active earth pressures were mobilized in the fill and acted against the face of the wall. The tail wall resistance depends on the friction between the tail wall and soil between the cells behind the active wedge. The resistance depends on the vertical effective stress and the lateral earth pressure coefficient, K_o, and the shear strength of the soil. A strength reduction factor was applied to the soil strength to account for the effect of soil sliding on the steel tail wall (i.e., rather than soil on soil). There is no factor (and should be no factor) that accounts for the passive resistance of the soil in front of the knuckles of the interlocks as they displace through the soil, as such an approach is unconservative and will result in tail walls that are of insufficient length to resist the active earth pressures acting at the front of the wall. The analysis performed by Gary Greene under contract with Terracon represents a reasonable approach to evaluating the internal stability from a static viewpoint. However, neither the Greene report nor the Terracon report mentioned what the minimum factor of safety should be for internal stability. This minimum value should be determined with due consideration to the lack of redundancy afforded by the OCSP. Additionally, the internal stability of the OCSP should be computed independently for each of the five areas of the project.

Seismic Hazard Considerations

The stakeholders have agreed to require part of the Port to perform as an essential facility. This is addressed in the design by considering seismic loads in excess of the Contingency Level Earthquake (CLE), the usual upper bound seismic load case for ports. However, the current performance criteria - accepting of moderate damage and anticipating economical repair - is not appropriate. Performance criteria that limits damage such that expedient repairs are possible within a short time frame should be considered. The final performance expectation, clearly stated, will effect an appropriate engineering performance criteria and resulting design. In light of this more stringent, but necessary criteria recommendation, several factors in the analyses need further evaluation.

The characterization and development of seismic loads should be further studied. A project of this importance should require a more intensive site-specific approach to characterize seismic hazard and to develop resulting design earthquake accelerograms. This is important, since the performance criteria are based on deformation estimates from time history-based dynamic analysis. In particular, the joint use of deterministic and probabilistic methods is recommended. It is further recommended that design target spectra be developed based on two scenario earthquakes: the Megathrust event and an event on the closer Castle Mountain fault. This has been addressed in the current probabilistic approach, but since these sources are well studied and known, it is prudent to develop deterministic spectra on these two events and select additional appropriate recorded accelerograms. For example, the existing synthetic accelerogram case was based on an event with maximum magnitude of 6.75 at 38 km epicentral distance, which corresponds to an event on the Castle Mountain fault. Current USGS hazard data places a magnitude of 6.9 on this fault. A further refinement would require that a spectra matching method should be used in place of PGA scaling. This technique will produce a better match between target spectra and the design earthquake accelerograms.

Current Corps guidance on use of time-histories in dynamic analyses where response may be importantly sensitive to time domain characteristics of the accelerogram recommend the use of at least five accelerograms depending on resulting sensitivity.

The ERDC team submits that significant shear strains are estimated that may lead to foundation failure ground motions with a return period of 2475 years (a Maximum Credible Earthquake, or MCE event). The foundation clays that were deemed non-susceptible to excessive pore pressure buildup under cyclic loads in two cyclic shear tests may still degrade in shear strength to a residual level when subjected to the MCE event.

While high straining in the foundation soils reduces the ground motions transmitted into the overlying engineered fill it is important to thoroughly investigate the adverse side of this effect, the possibility of strength loss in the high strain zones in the foundation and its impact on global stability.

Additional Considerations

It is not clear from the documentation provided how the tail wall anchoring capacity will be calculated in the 65% design. This is considered a fundamentally important factor in this OCSP concept and should be clearly evident in later design actions.

The ERDC team did not find analyses results on the internal stability of the backfill material to demonstrate cyclic strength; the design merely calls for preemptive densification of the granular fill between tail walls. On the premise that liquefaction, if it were to occur in the backfill, would result in loss of tail wall pullout resistance and destructive fluid pressure on the bulkhead face, it is recommended that criteria be produced to achieve sufficient backfill density and to accommodate quality assurance testing to validate densification efforts.

Toe heave may be evidenced in numerical modeling results; this is troublesome and should be carefully re-analyzed with a sensitivity analysis to be sure this is not a possible failure mode.

The concept of varying criticality across the several discrete areas of the OCSP structure implies that it is conceded that, although some cells may fail in extreme events, the cells near the north and south ends will be more robust and resist failure. Subsequent design analyses should consider joint details that would accommodate these extremes in behavior between adjoining cells, especially since current design has a shared tail wall between non-critical and critical cells.

Finally, current trends in the shipping industry show moving to larger ships requiring channel dredging depths of -55 ft MLLW. This may be a future desired change in operation during the design life of the facility and the final design should be evaluated for this case.

Final Design Considerations

The OCSP facility proposed is aggressive and unprecedented. The ERDC review team strongly encourages the Anchorage Port Authority to ensure that the final stages of design (the last 65%) for this facility strictly follows accepted engineering practice, in consideration of the severe risks posed by potential failure scenarios. An independent review and design panel, truly apart from the design team, is strongly recommended to instill confidence in the final result.

The OCSP concept appears to be a sound engineering alternative provided the following required twelve design actions and modifications are successfully adopted or completed.

Summary of Required Design Actions

1. Test borrow source to confirm stability model input and to determine the densification requirements.

2. Justify the target Factor of Safety of 1.2 for the short term static case.

3. Run static stability models with six feet of over dredge and a water elevation of about minus five or six feet MLLW.

4. Define how consolidation is to be confirmed before full depth dredging is performed.

5. Conduct a parametric study, investigating strength, modulus, and geometry, with the model for seismic loading to determine if the model is sensitive to small changes in input parameters.

6. Define target Factor of Safety for internal stability and model each cell area.

7. Further evaluate the earthquake loading by considering additional accelerograms and refined target response spectra criteria in the analysis.

8. Further evaluate the reduction in strength to the residual shear strength in light of the large strains predicted during an MCE.

9. Develop Quality Control plan and criteria for validating the densification of the backfill.

10. Further evaluate with a sensitivity analysis toe heave as a possible failure mode.

11. Develop compatible designs for adjacent cells with different performance objectives.

12. What is the maximum dredging depth under long term conditions. Is it possible to dredge the Port of Anchorage to -55 ft MLLW within the design life of the facility with the current design?

Mike Frank

From: Mike Frank
Sent: Monday, December 03, 2007 10:43 AM
To: Winn, Ryan H POA
Subject: POA

Ryan,

I have a couple of questions that maybe you can help me with.

A January 31, 2007 email from Diana Carlson to you, Michael Carter and Daniel Yuska indicates "we do not have the technical engineering design documents to conduct a detailed cost estimate ... the material take-offs are based upon concepts described within the MTR NEPA documentation." The May 15, 2007 email from Dennis Blackwell to you and to Andrea Elconin indicates that "A 35% design is not required to adequately generate a parametric estimate for the various alternatives identified for the dock expansion." However, the ERDC's Port of Anchorage Expansion Project 35 % Design Review (Revised December 22 2006) states that it received from CEPOA a "binder containing project design documents at the 35% level" and later remarks that ERDC's review as based on, among other things, "the project's nominal 35% design level." So, did 35% design documents exist in January and May of 2007, or is there some terminology confusion among the various documents? Also, may I review a copy of the "binder" mentioned by ERDC with submitting a FOIA request?

Thanks again for your help.

Michael J. Frank
Staff Attorney
Trustees for Alaska
1026 W. 4th Ave., Suite 200
Anchorage, Alaska 99501
Ph: (907) 276-4244 ext. 116
Fax: (907) 276-7110

EXHIBIT X

From: Winn, Ryan H POA [Ryan.H.Winn@usace.army.mil]
Sent: Tuesday, December 04, 2007 6:37 PM
To: Mike Frank
Subject: RE: POA

Michael,

Yes, confusion quite often exists with the expression, "35% Design". There is no clear standard that defines this expression, other than it is more detailed than a conceptual level, it represents a preliminary engineering effort, and it is indicative of design development over time. It can refer to a 35% level of effort, of which, several aspects of the design may be at a higher or lower level.

The Port of Anchorage expansion team is tracking separate design paths for both the structural/civil and geotechnical/seismic components of the project.
Completion of the structural/civil design specifications are sequentially phased respective to the construction phases.

ERDC referred to a "35% Design" review because the information submittal package included drawings that were referred to as such by the Port of Anchorage. The 35% drawings provided to ERDC were preliminary level design drawings for the preferred alternative and provided preliminary plan, profile, cross-section, alignment, and construction sequencing information without providing detailed technical specifications. ERDC specifically commented in their review presentation that the submittal package did not contain 35% level engineering design specifications by their use of the term.
At that time, some aspects of the design submittal were beyond 35% and some were below 35%. 35% level engineering design specifications (by Corps standards) for the whole project was not provided to ERDC; the submittal to ERDC was more specific to geotechnical/seismic stability studies and analysis for the whole project and structural/civil design for the initial phase of construction.

Cost estimate comparisons of design alternatives evaluated were not based on 35% design specification levels; cost estimates were developed from less than preliminary design levels (i.e., conceptual design levels), for parametric comparison purposes. Preliminary design specifications are only developed for the chosen/preferred alternative (it's too expensive and not necessary for feasibility/regulatory practicability assessments to develop 35% design specifications on all alternatives).

The information provided to ERDC was posted to the Port Expansion website to my understanding. Hopefully my response answers your questions clearly, if not, let me know and I'll try to explane it further. I'd be happy to meet with you in person again if you have further questions.

Ryan

Ryan Winn
Project Manager
Corps of Engineers

-----Original Message-----
From: Mike Frank [mailto:mfrank@trustees.org]
Sent: Monday, December 03, 2007 10:43 AM
To: Winn, Ryan H POA
Subject: POA

Ryan,

I have a couple of questions that maybe you can help me with.

A January 31, 2007 email from Diana Carlson to you, Michael Carter and Daniel Yuska indicates "we do not have the technical engineering design documents to conduct a detailed cost estimate ... the material take-offs are based upon concepts described within the MTR NEPA documentation." The May 15, 2007 email from Dennis Blackwell to you and to Andrea Elconin indicates that "A 35% design is not required to adequately generate a parametric estimate for the various alternatives identified for the dock expansion." However, the ERDC's Port of Anchorage Expansion Project 35 % Design Review (Revised December 22 2006) states that it received from CEPOA a "binder containing project design documents at the 35% level" and later remarks that ERDC's review as based on, among other things, "the project's nominal 35% design level." So, did 35% design documents exist in January and May of 2007, or is there some terminology confusion among the various documents? Also, may I review a copy of the "binder" mentioned by ERDC with submitting a FOIA request?

Thanks again for your help.

Michael J. Frank

Staff Attorney

Trustees for Alaska

1026 W. 4th Ave., Suite 200

Anchorage, Alaska 99501

Ph: (907) 276-4244 ext. 116

Fax: (907) 276-7110

-------- Original Message --------
Subject: RE: Current 35% design plan set for OCSP alternative
Date: Thu, 01 Feb 2007 15:40:16 -0500
From: Daniel.Yuska@dot.gov
To: brian.lance@noaa.gov, dcarlson@icrcsolutions.com
CC: Ryan.H.Winn@poa02.usace.army.mil, Michael.Carter@dot.gov, Jon.Kurland@noaa.gov, Jeanne.Hanson@noaa.gov, Phil_Brna@fws.gov, brucekk@muni.org
References: <45BFDE7F.7040404@noaa.gov> <DAEF09E16D489A4AB23A4E5343C5BD4811C6EF@anc-mx-01.icrcsolutions.com> <45C149AE.7050601@noaa.gov>

Brian,

These messages were forwarded to us, as the Lead Federal Agency, by our contractor for response.

From reading the email chain below, there appears to be confusion about which design documents have been completed and which documents were sent to ERDC for review. As Diana described in her earlier emails, the 35% design you are requesting will not be available from MARAD until March.

In short, the ERDC report erroneously cited what we gave them to review. We provided CEPOA with the 35% preliminary design drawings for the 2007 MTR ITB solicitation package (as described below). The Corps has been made aware of ERDC's error. Since the time of ERDC review, that solicitation package has advanced to 95% completion and is available on the Project website(www.portofanchorage.org).
We also provided CEPOA the geotechnical feasibility documents, which are also available on the project website. Because we were not on the review panel, questions regarding ERDC's review of the material are better addressed by the Corps.

If you have further questions or need additional information, please contact me or Michael Carter.

-Dan Yuska

Daniel E. Yuska, Jr.
Environmental Protection Specialist
US Maritime Administration
400 7th St, SW
Washington, DC 20590
202-366-0714

-----Original Message-----
From: Brian K. Lance [mailto:brian.lance@noaa.gov] Sent: Wednesday, January 31, 2007 9:00 PM
To: Diana Carlson
Cc: Winn Ryan H POA02; Carter, Michael <MARAD>; Yuska, Daniel <MARAD>; Jon Kurland; Jeanne Hanson; Phil Brna
Subject: Re: Current 35% design plan set for OCSP alternative

EXHIBIT Y

Diana

I have pasted paragraph 2 from the ERDC report below...this is what the corps reviewed...these are the 35% level design documents I was referring to in my previous email.

"Materials provided to the ERDC team by CEPOA included a binder containing project design documents at the 35% level, reports and test data on field and laboratory efforts conducted to date to characterize the geotechnical properties of site soils, reports of computational analyses on the anticipated behavior of the proposed facility both under static and dynamic (earthquake) loading, and various correspondence among project stakeholders and the construction companies responsible for design and fabrication. In addition, CEPOA provided reports and test data not included in the binder in response to questions raised by the ERDC team during the review."

NMFS is looking for the design drawings of the OCSP including:
1. plan views sections and elevations,
2. the extents of the tail walls,
3. the piling for the crane rails,
4. details of the face of the dock including fenders, pile lengths, embedment depths. 5. scour protection at the toe of the sheets 6. the structural concrete deck details....etc.

Do the 35% plans the ERDC used for review provide these details for the entire project? If not, would you also please provide the drawings/details used to calculate cost estimates for OCSP and pile supported alternatives. Thank you for your assistance.

cheers

Brian Lance..271-1301

Diana Carlson wrote:

Brian -

We currently have 95% design documents available for only the scope of

work we have proposed for construction in 2007 -- to the far north and

to the far south of the existing dock to alleviate immediate operational conflicts; the majority of this scope is earthen fill retained behind rock dikes with approx 350 lf of OCSP to the north at shallow depths.

These pre-final drawings are currently available for downloading from the project webpage, as a pre-solicitation notice. See http://www.portofanchorage.org/op_procurement.asp (reference Solicitation #4406-2-S72.) I am happy to provide the entire 100% bid package mid-February for this 2007 construction scope, complete with all drawings and specifications (we will have the bid package complete

within approx. 2 weeks).

The 35% preliminary engineering design (for all future work planned for construction in years 2008 through 2012) is not due from the design team until later this spring (approx. March).

Following our review/approval of that 35% submittal, we will advance the design and preparation of four separate bid packages from 35% to 100% on separate schedules.

Each design package can be provided to you as they become available; each will be posted to the webpage at 35%, 65%, and 95% design development milestones.

I have attached a revised one-page phasing plan that delineates individual design/construction packages.

Please call or stop by if you have any difficulties downloading any of

the design documents.

Regards!

Diana J. Carlson

Port of Anchorage Expansion Team/ICRC

421 West First Street, Suite 200

Anchorage AK 99501

(907)264-8902 direct line

-----Original Message-----
From: Brian K. Lance [mailto:brian.lance@noaa.gov]
Sent: Tuesday, January 30, 2007 3:11 PM
To: Diana Carlson
Cc: Brian Lance; Winn Ryan H POA02
Subject: Current 35% design plan set for OCSP alternative

Hi

Ryan Winn at the Corps suggested I contact you regarding our request

for:

POA Current 35% design plan set for OCSP alternative.

Please let me know if you are able to provide a copy for our review. Thank you.

Brian Lance

Fisheries Biologist

NMFS

271-1301

Re: [Fwd: RE: Current 35% design plan set for OCSP alternative].eml	**Content-Type:** message/rfc822 **Content-Encoding:** 7bit

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

March 5, 2007

Colonel Kevin J. Wilson
U.S. Army Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Re: POA-2003-502-N, Ship Creek

Attn: Ryan Winn - Ryan.H.Winn@poa02.usace.army.mil

Dear Colonel Wilson:

The National Marine Fisheries Service (NMFS) has reviewed the Port of Anchorage (POA) Response to Public and Agency Comments, dated September 25, 2006, for Phase II of the Port of Anchorage expansion project. The Maritime Administration (MARAD) completed an Environmental Assessment (EA) for the port project on behalf of the POA. The applicant's preferred alternative, open cell sheet pile design (OCSP), would discharge fill material over approximately 135 acres of intertidal and subtidal waters of upper Cook Inlet and dredge 235 acres. Phase I of the project permitted 27 acres of intertidal fill area on the north end of the port. Phase II, if permitted as proposed, would discharge approximately 9.4 million cubic yards of material over the remaining 108 acres of intertidal and subtidal habitat and dredge approximately 633,000 cubic yards of material over approximately 47 acres for the construction of the proposed sheet pile dock. To obtain fill material, an additional 34.5 acres of wetlands would be impacted through the development of the Cherry Hill and North End borrow pits.

NMFS continues to have serious concerns about the effects of this project on important salmon habitat and beluga whales. The applicant has not rigorously evaluated the practicability of less damaging alternative designs as we recommended – particularly a partially pile supported design that maintains shallow water fish habitat. NMFS offers the following review of the POA's response to comments per our authorities under the Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, and Marine Mammal Protection Act.

Port Capacity – Purpose and Need

The Port of Anchorage expansion project is undeniably important to the City of Anchorage and the State of Alaska. NMFS is not opposed to the port expansion. However, NMFS is concerned that opportunities to avoid and minimize impacts to valuable habitat for fish and beluga whales in upper Cook Inlet are precluded by the preferred alternative. The response provided by the POA still does not adequately justify the need for the 135 acres of intertidal and subtidal fill associated with the OSCP design of the preferred alternative.

The EA and Finding of No Significant Impact (FONSI), prepared for this project by MARAD, and POA's Response to Public and Agency Comments do not substantiate that the preferred alternative is the least environmentally damaging practicable alternative (LEDPA). These

EXHIBIT Z

documents rely on the POA's analysis of the Purpose and Need for the proposed project and while there are many statements regarding the purported needs, we have not seen supporting documentation to substantiate these needs or demonstrate that a partially pile supported design is infeasible. As specified in 40 CFR 230.10(a), "Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." Further, the Clean Water Act Section 404(b)(1) Guidelines state that an alternative is "practicable" if it is "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

Reasonable Dock Design Alternatives

The POA's response to resource agency concerns regarding a more comprehensive analysis to examine a smaller dock, pile-supported design, and combination sheet pile/pile supported designs that allow preservation of some intertidal habitat function is based on several factors:

- Size of the Proposed Expansion

Please see the above comments. The applicant should provide a clearer justification for the acreage requirements for the proposed port expansion.

- Costs

The POA states (page 7, paragraph 2) that, "Based on current cost estimates, the cost to construct a completely pile-supported dock would be over three times the cost of an OCSP structure. As this clearly represents an unreasonable expense for the stated project purpose, the following discussions focus only on the OCSP structure instead of a design that incorporates a partially pile-supported dock with an OCSP structure."

The POA continues (page 7, paragraph 4 – Construction Costs), "… based on a detailed, per-square-foot cost estimate provided by the waterfront design team, a combination structure consisting of a 50-foot-wide section of pile-supported platform dock in front of an OCSP section would increase the basic construction cost by $98.2 million, nearly a 25 percent increase from the current estimated cost. A 100-foot-wide section of pile-supported dock section would represent nearly a 50-percent increase in cost. Any increase in cost would exceed current funding levels for the project."

POA further states (page 10, paragraph 3), "Pile-supported structures will require a larger quantity of concrete, a product currently in high demand within Alaska. It is possible that imports of cement at the current rate would not be sufficient to support the MTR project and other private, municipal, and state projects at the same time. Limitations on material availability could delay construction and increase project costs."

Cost is a legitimate consideration in determining the practicability of alternatives. However, the aforementioned statements are broad and unsubstantiated. NMFS understands the "detailed, per-square-foot cost estimate" was based on conceptual drawings (available on POA web site, Diana

Carlson, ICRC pers. comm.) rather than the standard 35% plan set. Where is this comparative cost analysis? How accurate can a "detailed, per-square-foot cost estimate" be based on conceptual design drawings?

POA states (page 9, paragraph 5), "The technology required to meet the overall project purpose and need using each of the three alternatives exists. The differences in the available technologies are primarily a function of increased cost to achieve the same function with a pile-supported dock that could be achieved by an OCSP structure."

This last comment by the POA illustrates the importance of an accurate, detailed, and independent cost analysis, as cost is the primary factor affecting the range of practicable alternatives. In other words, all alternatives are technologically feasible and will meet the project's purpose and need, and cost is the key factor in identifying whether a partially pile supported design is the LEDPA. Given the overall costs of the project, what is the incremental cost of a partially pile supported design versus OCSP?

- Technology

POA states (page 9, paragraph 8), "Since OCSP structures have greater internal stability than pile-supported structures during seismic events, they are likely to survive a significant seismic event with less damage. As previously noted, a combination structure may be more vulnerable to seismic damage unless specific design features are incorporated."

POA states (page 12, paragraph 6), "the Port and MARAD have completed comprehensive and detailed analyses that definitively demonstrate that the proposed OCSP design performs as well as or better than any of the alternatives, based on the industry-recommended level of seismic loading and extreme events. From the standpoint of safety, stability, and survivability, the preferred alternative is the most practicable."

POA states (page 13, paragraph 6), "The OCSP structure exhibits global stability similar to a pile supported dock structure. The OCSP structures were found to have the internal stability needed under required seismic loading. The deflections and settlements were found to be within acceptable tolerances. Although the pile- supported dock concept is stable for probable seismic events, it is not as stable as the OCSP concept under higher seismic loadings equivalent to those of the 1964 earthquake. Based on seismic performance, cost, and constructability, MARAD selected the OCSP structure as the preferred alternative for the Port expansion."

These statements are unsubstantiated in the document and contrary to our understanding of guidelines and standards used in the design of container ports in other seismically active areas (e.g. Port of Long Beach, Port of Los Angeles, Port of Oakland, Port of Seattle). The American Society of Civil Engineers has a committee working on the seismic design of piers and wharves. This committee is focusing on pipe pile supported structures rather than OCSP and is incorporating state of the art design methodologies into this standard.

A review of alternative structural concepts cites concern over a low Factor-Of-Safety for the interlock stresses, the extreme height of the vertical face (80-90 feet), lack of structural redundancy in a "lifeline" facility, as well as overall global stability of the OCSP design

(Chapman and Fernandez 2002, Moffatt & Nichol 2002). Alternatively, pile supported docks are predictable, redundant, and much lighter in terms of seismic mass, thereby reducing the forces due to acceleration during a seismic event, ultimately increasing global stability. The authors also list four alternative designs, including partial pile design. Have these alternative designs been considered? If so, where are the cost and performance data associated with POA's review?

Due to the increased design requirements (U.S. Army Engineer Research and Development Center, ERDC review), including soils improvements, extra long tail walls, a reinforced concrete deck, piling under the crane rails, a concrete girder at the face of the dock etc., it seems that there may be more tonnage of materials in the sheet pile dock than a pile supported dock. Have the added requirements of the ERDC review, as well as the escalating price of sheet pile, been factored into current cost estimates? Driving long flat sheets of steel underwater and keeping them straight and plumb for a 90 foot high sheet pile dock is unprecedented and will be extremely difficult affecting construction costs.

NMFS has no expertise in geotechnical matters related to the POA's design, however we have a history of working with dock and harbor design projects to minimize effects to marine resources. More importantly, we are interested in clarifying the technical project design issues insofar as that helps inform the identification of the LEPDA for the project. The August 15, 2005, letter from the Geotechnical Advisory Committee (GAC) to POA suggests that engineering professionals have many questions and concerns about the project design, in particular issues related to global stability of the earth filled wall in a seismic event [Chapman and Fernandez 2002, Moffatt & Nichol 2002; see also John Daley letters to GAC (July 24, 2006) and the Corps (February 6, 2007)].

In order to resolve this issue the Corps should direct a detailed independent review, based on 35% design plan, of the OCSP design and a partial pile supported design, by someone not currently involved in the project. NMFS previously requested an independent review in a letter to the Corps dated March 20, 2006. NMFS applauds the ERDC review you commissioned, but it did not address our request. As stated on page 1 of the ERDC report, "The review objective was to determine if the structure could suffer structural damage or failure during a seismic event as a result of Corps of Engineers construction or maintenance dredging operations." NMFS objective was different, "an independent third party review to assist the Corps in evaluating the practicability of less damaging designs for the project." This review would include a comparison of technology, seismic safety and stability, and cost analysis for both the OCSP and partial pile-supported designs. Cost analysis should include comparable cost factors such as: quantities of steel, concrete, and fill as well as constructability estimates.

NMFS recommends that the Corps and MARAD jointly select the review panel in concert with the GAC, thereby removing the Port of Anchorage and its consultants from that role. NMFS understands the GAC (comprised of volunteers from various engineering firms in Anchorage) is interested in being involved in some capacity and would lend valuable local expertise for any review panel, such as one developed via the American Society of Civil Engineers committee on seismic design standards for container ports. Resolving questions about the design alternatives via a clearly independent review would greatly benefit the public review process for this important project. ERDC also recognized the value of an independent review to address stability issues, stating on page 7 of its report: "An independent review and design panel, truly apart from the design team, is strongly recommended to instill confidence in the final result."

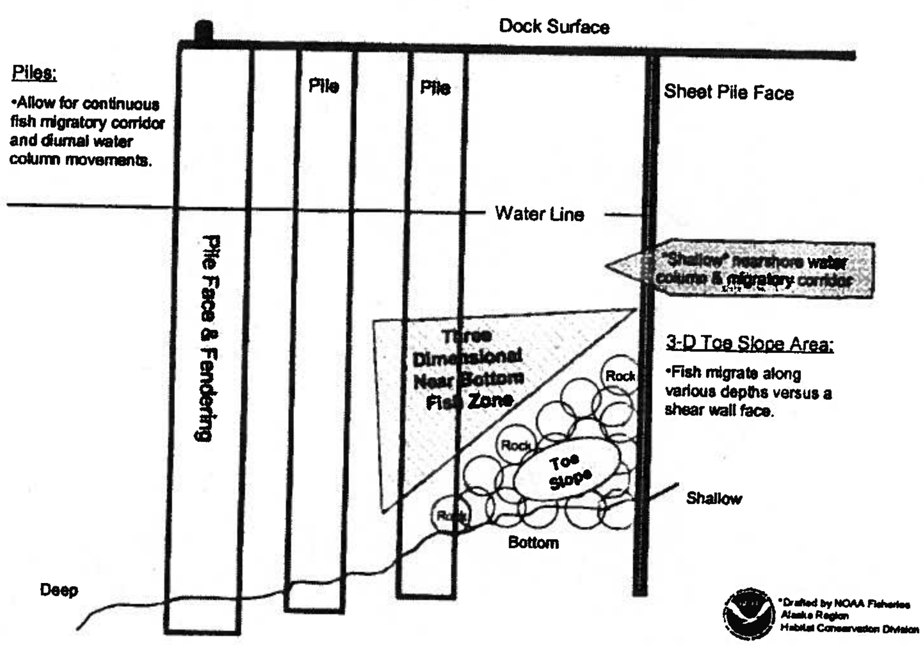
- Environmental Impacts

In its response the POA states (page 10, paragraph 7), "An OCSP structure is considered to offer the least potential for overall adverse impacts to the aquatic habitat." The POA conclusions regarding nearshore aquatic habitats in upper Cook Inlet are subjective and not supported by data from studies completed for this project (Pentec 2005a) and the proposed Knik Arm bridge (Pentec 2005b), nor other studies in the vicinity (Dames and Moore 1983, Moulton 1996). These studies document that shallow waters in this area provide migrating, rearing, and foraging habitat for all five species of Pacific salmon, saffron cod, and a variety of prey species such as eulachon and longfin smelt.

NMFS has consistently recommended pursuing an alternative design for the project that would significantly reduce impacts to living marine resources. Specifically, NMFS has recommended the use of a combination pile support and sheet pile design such as Alternative B in the Environmental Assessment or the Pile-Supported Dock with Slope (see Environmental Assessment page 2-30). Such a design would minimize the loss of nearshore habitat and provide shallow water, contoured slope refuge for out-migrating juvenile salmon and adults. Details on effects of the OCSP alternative on fish and EFH are outlined in our previous letters.

The following figure illustrates conceptually the type of design we would like to see analyzed in more detail. Although NMFS does not have expertise in structural engineering, this concept is based on our experience working on many port and harbor development projects in Alaska that incorporate cost effective design features to minimize impacts to fish habitat.

Pile & Sheet Pile Combination Design for Marine Application*



Summary

In summary, the Clean Water Act Section 404(b)(1) Guidelines contain substantive environmental criteria used in evaluating discharges of dredged or fill material. Under these guidelines, no discharge can be permitted if a practicable alternative with less adverse impact on the aquatic environment is available. NMFS would like to work with the Corps to try to reach consensus on the LEDPA as well as mitigation before the Corps issues a draft decision document. In order to resolve this issue the Corps should: 1) clarify and substantiate the project purpose and need as detailed above; 2) expand and clarify the alternatives analysis by directing a detailed independent review of the practicability of a partially pile supported design (based on technology, seismic stability, cost, and environmental impacts) by someone not currently involved in the project; and 3) engage in a open, collaborative process involving NMFS and other resource agencies to identify suitable mitigation to offset the unavoidable impacts of this project.

Our recommendations regarding the minimization of fill and evaluation of a partially pile-supported alternatives are intended to conserve nearshore fish habitat, primarily for coho and Chinook salmon. Additionally, we remain concerned with the impacts of the port expansion project on Cook Inlet beluga whales, as outlined in our letter dated January 31, 2007. Those concerns deal largely with construction and operation of the port, rather than specific design alternatives. We have requested that any permit issued by the Corps include specific mitigation and monitoring conditions necessary to promote the conservation of Cook Inlet beluga whales.

If you have questions regarding this letter, please contact Brian Lance at (907) 271-1301 or brian.lance@noaa.gov.

Sincerely,

Robert D. Mecum
Acting Administrator, Alaska Region

cc:
POA - Bill Sheffield, 2000 Anchorage Port Road, Anchorage, Alaska 99501
MARAD - Michael.Carter@marad.dot.gov
ADNR/OHMP - stewart_seaberg@dnr.state.ak.us
EPA - dean.heather@epa.gov
USFWS - phil_brna@fws.gov
Barbara Mahoney – Barbara.Mahoney@noaa.gov
Records

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Chapman, D. R. and G. Fernandez. 2002. Port of Anchorage Potential Expansion Project, Open Cell Sheet Pile Design Concept Independent Geotechnical Review. Lachel and Associates.

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COE Ship Creek POA 2003-502-N response phase II BL 3-4-07

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

April 7, 2005

Mr. Michael Carter
U. S. Department of Transportation
Maritime Administration
400 7th Street SW
Room 7209
Washington, D. C. 20590

Re: Anchorage Marine Terminal Redevelopment Environmental Assessment

Dear Mr. Carter:

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) has reviewed the final Environmental Assessment (EA) and the Finding of No Significant Impact (FONSI) for the Port of Anchorage (POA) Marine Terminal Redevelopment project. The project will utilize federal funding administered by the U. S. Department of Transportation Maritime Administration (MARAD). The preferred alternative would result in filling 135 acres of tidelands.

General Comments Related to Fish

The final EA states numerous times that "in the vicinity of the POA, fish diversity and abundance are low." NMFS does not concur with this statement. Fifteen species of fish were captured in the limited sampling program conducted in 2004. A combined species list of all studies conducted in the last 25 years (USDOT 1983, Moulton 1997, Pentec 2004a, 2004b, 2004c, 2004d, 2004e, and 2004f) indicates there are over 20 species of fish in the POA vicinity. NMFS does not consider a community assemblage of over 20 species to be "low species diversity". In addition, NMFS does not consider abundance to be low. Large numbers of fish probably move through the POA vicinity at certain points in time. The limited sampling conducted could easily miss large pulses of fish that use the area seasonally.

Data from all Knik Arm studies would seem to indicate that juvenile salmonids use the mudflats as the tide moves in and out. What those fish are doing on the mudflats is speculative although in several studies food was found in the stomachs of fish (USDOT 1983 and Moulton 1997). Based on the apparent use over a wide time period, Knik Arm mudflats appear to serve an ecological role in juvenile salmonid life history.

The preferred alternative (Alternative A) would eliminate approximately 9,000 linear feet (66 acres) of tidal mudflats and habitat used by numerous species of fish. The entire length of the proposed structure would consist of sheet pile dredged to a depth of 48 feet below MLLW. Alternative B would maintain 120 feet of pile-supported dock along the entire face of the dock, with a strip of habitat under the dock that could serve as a shallower subtidal fish passage

EXHIBIT AA

corridor. Alternative C would have 120 feet of pile-supported dock for 1375 feet in the middle of the 9,000 foot structure. The rest of the structure would be sheet pile across the dock edge.

NMFS questions the determination in the EA that pile driving related noise impacts would be substantially greater for Alternative B than Alternative A. The primary difference between the two alternatives is that a vibratory driver would be used for sheet pile in Alternative A and an impact driver would be used for the pilings in Alternative B. However, a vibratory driver could be used to drive sheet pile for Alternative B. NMFS understands that an impact driver is required for latter stages of pile driving to set the piles. This approach has been taken on numerous other projects that NMFS has reviewed.

In summary, NMFS' primary concern with the proposed alternative is the elimination of almost 9,000 linear feet of functional tidal mudflats in the preferred alternative. Elimination of this 9,000 foot strip of tidal mudflats will force fish to move across the face of the sheet pile walls of the port and out into deeper water with more current. This disruption of ecological function could impact the movement of juvenile salmonids along the east side of Knik Arm. Thus, from the perspective of fish habitat, NMFS prefers Alternative B because a fish passage corridor would be provided beneath the dock..

Essential Fish Habitat Assessment

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires Federal action agencies to consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH. An EFH Assessment is included as part of the EA. The EFH Assessment states "Based on the impact analysis, MARAD concludes that there would be adverse effects to EFH from the proposed action." NMFS agrees with this determination. However, a few inaccuracies occur in the EFH Assessment. Although sockeye salmon are mentioned numerous times in the analysis, that species is not included in the text and appropriate tables. The coho salmon life history information is incorrect. Most coho salmon spend 1 to 3 years in freshwater lakes and streams prior to migrating to sea, not 3 to 5 years as indicated. A few fish do spend as much as 5 years, but this is rare. Adults spend 6 to 18 months at sea before returning to spawn. No coho salmon spend 2 years at sea.

The EFH Assessment also states "However, the use of mitigation measures included within the proposed action and described above, would ensure that the effects would be less that significant." The term significant is routinely used in the NEPA process to determine the degree of project impact (Council on Environmental Quality Regulations, Sec. 1508.27). NMFS does not attempt to assess the significance of an adverse effect to EFH using the NEPA definition. Rather, based on the information describing the action and an analysis of the potential adverse effects on EFH and the managed species, we consider whether the adverse effects would be minimal, more than minimal but less than substantial, or substantial (see 50 CFR 600.920). Once an adverse effect determination is made, NMFS focuses on measures to avoid, minimize or mitigate the adverse effect.

The mitigation measures proposed by MARAD, other than Best Management Practices to be used during construction, do not reduce or adequately compensate for the loss of living marine resources, including EFH.

Alternatives

None of the proposed alternatives meet the project purpose and need without having an adverse impact to EFH. Alternative B would minimize the adverse effect by providing a small corridor underneath the 120-foot dock for fish passage. Consequently, as previously stated, NMFS prefers Alternative B. Based on information on pages 3-144 and 3-146, Alternative B would cost approximately $139 million more than Alternative A. NMFS is interested in discussing the basis for this cost estimate with MARAD and the POA.

Proposed Mitigation and Conservation Recommendations

A few of the mitigation measures offered in the EA may provide some level of compensation for adverse effects to EFH. NMFS cannot recommend appropriate mitigation measures until the project design is resolved. However, the proposal to modify 25 acres of mudflats south of Ship Creek is not an acceptable component of the overall mitigation plan. This mitigation project would eliminate functional EFH, not restore lost EFH to the area. The 25 acres would be changed to a habitat type (freshwater) not useable to living marine resources. NMFS is not opposed to a coastal trail extension, but any such trail should follow the base of the bluffs and not cross the mudflats.

The best way to minimize project impacts would be to select Alternative B. NMFS recommends continued collaboration with MARAD and POA on ways to minimize project impacts to EFH and develop suitable compensatory mitigation for unavoidable impacts.

If you have any questions regarding EFH or fish resources, please contact Brian Lance at (907) 271-1301 or Larry Peltz at (907) 271-1332.

Sincerely,

For James W. Balsiger
Administrator, Alaska Region

cc: ADNR/OHMP stewart_seaberg@dnr.state.ak.us
EPA dean.heather@epa.gov)

USFWS phil_brna@fws.gov
COE – Anchorage (Ryan.H.Winn@po02.usace.army.mil),
Applicant: Port of Anchorage, Attn: Roger Graves, 2000 Anchorage Port Road, Anchorage, Alaska·

References Cited:

Moulton, L.L. 1997. Early Marine Residence, Growth, and Feeding by Juvenile Salmon in Northern Cook Inlet, Alaska. Alaska Fishery Research Bulletin 4:154-177.

National Marine Fisheries Service (NMFS). 2004. Essential Fish Habitat Guidance. Found at: http://www.nmfs.noaa.gov/habitat/habitatprotection/pdf/EFH%20Consultation%20Guidance%20v1-1.pdf

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Pentec. 2004c. Summary of September Sampling Activites – Knik Arm, Alaska. Prepared for HDR Alaska, Inc. 6 October.

Pentec. 2004d. Summary of September Sampling Activites – Knik Arm, Alaska. Prepared for Integrated Concepts and Research Corporation. 15 October.

Pentec. 2004e. Summary of September 30-October 1 Sampling Activites – Knik Arm, Alaska. Prepared for Integrated Concepts and Research Corporation. 15 October.

Pentec. 2004f. Summary of November 8-10, and 16-17, Sampling Activites – Knik Arm, Alaska. Prepared for Integrated Concepts and Research Corporation. 22 November.

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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-0898

REPLY TO
ATTENTION OF:

Regulatory Branch
POA-2003-502-N

Mr. Kevin Bruce
Deputy Director
Port of Anchorage
2000 Anchorage Port Road
Anchorage, Alaska 99501-1024

Dear Mr. Bruce:

This is in regard to the Port of Anchorage's Department of the Army (DA) permit application for Phase II of the Port Intermodal Expansion Project, which involves the completion of the proposed port expansion associated with the Marine Terminal Redevelopment Project (MTR) at the Port of Anchorage and the wetland developments associated with the Cherry Hill and North End Runway Material Extraction and Transport Projects on Elmendorf Air Force Base.

The U.S. Department of Transportation, Maritime Administration (MARAD) is the lead federal agency for the Port Intermodal Expansion Project. The proposed MTR project involves the construction of a new open-cell sheetpile dock in intertidal and subtidal waters of Knik Arm west, northwest, and southwest of existing port facilities. The two Material Extraction and Transport Projects collectively involve the development of 352 acres for material extraction and the removal of 20.5 acres of wetlands. The MARAD has prepared Final Environmental Assessments (EAs) with Findings of No Significant Impact for the three above-referenced projects. Considering that the project involves work in waters of the U.S. under DA regulatory jurisdiction, the Port of Anchorage has applied for DA permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.

Our review for compliance with the Environmental Protection Agency's 404 (b)(1) guidelines indicates that the proposed project may not contain all appropriate and practicable steps to minimize potential impacts to the aquatic ecosystems that would be affected by project, nor does it appear to represent the least environmentally damaging practicable alternative.

The least environmentally damaging practicable alternative may include reducing the size of the proposed expansion of port facilities in waters of the U.S., and/or design changes which minimize the amount of fill material discharged into waters of the U.S., including special aquatic sites (wetlands and mudflats). An alternative is considered practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose.

The Corps has determined that the following information is necessary for our review of the proposed project's compliance with the 404(b)(1) guidelines:

EXHIBIT BB

1. As stated in the MARAD MTR EA, a criterion established under the purpose and need for the project is to increase the operational capacity of existing port facilities by providing 135 additional acres to accommodate growth of existing customers and to provide additional space for new customers and military staging. According to the EA, the 135 acres would be allocated as follows: 38 additional acres for container storage and military use, -5 acres for autos/vehicles (which is consolidated into the container acreage). 27 additional acres for new barge customers, 3 additional acres for a passenger cruise terminal, 11 additional acres for an industrial use area, 7.8 additional acres for a future development area, 14.4 additional acres for misc. and POA administrative facilities, and 39 additional acres for the new marine terminals and dock front area. As required by Corps and EPA regulations, a DA permit shall not be issued unless the proposed project represents the least damaging practicable alternative. Therefore, applicants must minimize project impacts to waters of the U.S. to the maximum extent practicable. Please explain how the proposed Port Expansion footprint represents the minimum area needed to accomplish the overall project purpose. Your response should include an itemized accounting of all proposed fill areas in waters of the U.S., including wetlands, with explanations and supporting documentation justifying the necessity of the proposed acreage (i.e., why it would be impracticable to have a smaller area). Please also explain the methodology used to extrapolate the additional operational area requirements and why configurations and/or operations cannot be modified to minimize the proposed fill footprint. In light of the above, please also explain how the proposed Cherry Hill and North End Borrow Pit developments have avoided and minimized impacts to wetland areas and functions.

2. As stated in the MARAD MTR EA, three alternatives were determined to meet the stated purpose and need of the project (the proposed project, a pile-supported dock with fill, and a combined sheet pile/pile-supported dock construction). The reasons stated for the identification of the preferred/proposed alternative over the other two alternatives were that the proposed action would produce fewer adverse environmental impacts, be easier and less costly to maintain, and would be less complex and less costly to construct. The environmental resource agencies, a local tribal government, and nonprofit environmental organizations have all stated that a project design that minimizes fill placement in intertidal and shallow subtidal waters, which can be accomplished by minimizing the project's footprint and/or by a design that incorporates a pile-supported dock, would result in less adverse impacts to fish and beluga whale habitat. Please explain why no other project designs, which incorporate a partially pile-supported dock structure, would be practicable. Reasoning based on cost should be limited to construction-related costs and should include a detailed and itemized cost analysis.

3. The MARAD MTR EA states that Best Management Practices (BMPs) would be identified and implemented to prevent erosion and sedimentation during construction and operation, including the project area and adjacent properties and watercourses. Please identify these BMPs and how they would be implemented to prevent adverse changes in sedimentation/erosion patterns on and offsite (e.g. adjacent properties, Ship Creek, etc…). Please also explain how construction sequencing would be managed to prevent changes in sedimentation patterns that could adversely affect the Corps maintenance dredging program at the port.

4. Finally, as mentioned in the MARAD MTR EA, monitoring and studies would be conducted before, during and (in some cases) after construction for fish and beluga whales. Please identify any fish/beluga whale monitoring and/or studies proposed during and after construction activities and any adaptive management response plans.

Please provide this additional information within 30 days, if additional time is needed for completion, please notify me of your anticipated submittal date within 21 days. Your response should be as concise as possible. Failure to provide this information could result in withdrawal of the application (closure of the file), a final decision without the necessary (requested) input, or permit denial due to lack of sufficient information.

You may contact me at (907) 753-2712, toll free from within Alaska at (800) 478-2712, by email at ryan.h.winn@poa02.usace.army.mil, or by mail at the letterhead address, ATTN: CEPOA-CO-R-S, if you have questions. For additional information about our Regulatory Program, visit our web site at www.poa.usace.army.mil/reg.

Sincerely,

Ryan H. Winn
Project Manager

Enclosures

Lawmakers cringe over governor's deep budget cuts

Vetoes' trim $231 million from State's capital budget

By Tim Bradner
Alaska Journal of Commerce
Publication Date: 07/08/07

Gov. Sarah Palin is being criticized by legislators for poor communications during the Legislature's regular session, when lawmakers were putting together the state capital budget. Palin announced $231 million in vetoes from the capital budget June 29, catching legislators by surprise.

"Her communications could have been better," said Rep. Kevin Meyer, co-chair of the House Finance Committee. "If she had told us up front that she wanted a $450 million capital budget instead of a $550 million budget, we could have met it."

"All she told us was that she wanted a smaller capital budget than last year, and we accomplished that. Our capital budget was 40 percent lower than last year's," Meyer said.

Other legislators said that had Palin given them guidelines it would have saved time and disappointment among constituents.

Senate President Lyda Green, R-Wasilla, said she was caught off guard by the priorities and criteria.

"If you're going to have new rules, announce them the first day, not one month after we leave Juneau," she said. "She needs to make it clear the sorts of things that aren't going to be funded.

The $231 million in cuts drew praise from some lawmakers who believed the budget originally reflected too much spending.

"The most consistent comment we've heard from voters is that there is too much state spending. The governor was elected with a huge approval rating, and I think this is what people have asked her to do. We'll be in a deficit in a couple of years and it's better to make the cuts now."

Anchorage Democrat Les Gara, a House Finance Committee member who voted against the capital budget, also said Palin did the right thing. "The Republican leadership went on a spending spree and it was not responsible," Gara said. "I want there to be a real public process that is open and transparent where people justify the projects they ask for in front of the microphone."

The cuts affected more than 300 local projects, and reduced the budget to

EXHIBIT CC

nearly $1.6 billion. Palin also signed the operating and mental health budgets, but there were no cuts from what lawmakers submitted.

The capital budget includes $416 million in state funds, down from the $546 million contained in the budget sent to Palin. It still tucks away $50 million into the Constitutional Budget Reserve, a state savings account.

Although the governor said her priorities were consistent and that she supports core state responsibilities, such as infrastructure, she vetoed $10 million for expansion of the Port of Anchorage, a regional facility serving 90 percent of the state population. She approved $10 million for environmental studies for an extension of the Alaska Railroad to Port Mackenzie.

Bill Sheffield, director of the Anchorage port, was surprised by the veto and said he is now concerned that the port's major expansion program will be able to keep on schedule. Large cranes for the port have to be ordered this winter and if the port cannot get the $10 million restored next session, the facility may not be ready for the cranes when they arrive, Sheffield said.

Palin also vetoed money for energy projects in the Southcentral-Interior railbelt, including the 50 megawatt Fire Island wind project and funds to restart the Healy Clean Coal Project, a 50 megawatt new-technology coal power plant at Healy that has been mothballed because of a commercial dispute between Golden Valley Electric Association of Fairbanks and the Alaska Industrial Development Authority, the state corporation which owns the plant.

However, governor let stand a $46.2 million appropriation to complete the Swan Lake-Tyee intertie project, a half-completed 57-mile transmission line that will bring surplus hydro power from Lake Tyee, near Wrangell and Petersburg, to Ketchikan, which needs more power.

Palin said at a June 29 news conference that the cuts should send a message to lawmakers for next year's budget considerations. "We need to live within our means," Palin said. "Even though we have a surplus, that doesn't warrant a spending spree."

The state should prioritize its projects, while not spending a finite potential surplus created by high oil prices, she said. Oil is responsible for 85 percent of state revenue, but oil production is declining and deficits are expected in the next two years.

Palin said her administration prioritized funding for education, transportation and public safety projects. Then, capital budget projects were judged against whether her administration thought other public entities, such as the federal or local government, should pay for them.

After that, Palin examined whether the project was already underway or is receiving partial matching funds from another source. "We had to look at wants versus needs, needs of course weighing much more heavily than wants," Palin said. "This was a deliberative process, meant to provide consistency."

Steve Quinn of the Associated Press contributed to this article.
Click here to return to story:
http://alaskajournal.com/stories/070807/loc_20070708005.shtml

Diana Carlson

From: Diana Carlson
Sent: Wednesday, January 31, 2007 1:11 PM
To: Winn Ryan H POA02; Michael Carter; Daniel Yuska
Cc: 'Kevin Bruce'
Subject: FW: C3506394 has been scanned

Attachments: C3506394.pdf

C3506394.pdf (18 KB)

Ryan - the attached scan is Attach 1 to our B1 letter response, previously provided.

See "notes": The attached compares the magnitude level cost per sq foot for only the variable items between two dock types, and excludes similar items required of either dock structure. This is not a detailed cost estimate; we do not have the technical engineering design documents to conduct a detailed cost estimate. Further, the materials take-offs are based upon concepts described within the MTR NEPA documentation.

Cathodic protection was also excluded from this comparison, which varies greatly based upon square footage of exposed steel.

djc

EXHIBIT DD

Attachment 1

OCSP and Pile Supported Dock Cost Comparison

	Description	Quantity	Unit	Weight	Unit cost	Material	Installation			Total
Pile Supported Dock										
Piles	HDG P36"x1"t X200'	10	ea	748000	$0.75	$561,000	$0.75	$561,000		$1,122,000
Reinforced Concrete	2' t	300	CY	1296000	$300	$90,000	$500.00	$150,000		$240,000
Armor Rock	Purchased and Placed	750	CY		$100.00					$75,000
Filter Rock	Purchased and Placed	150	CY		$40.00					$6,000
									Subtotal:	$1,443,000
									Cost per ft^2:	**$360.75**
Open Cell Dock										
Pile:	Face Sheets (PS31- 90')	17	ea	77877	$0.50	$38,939	$0.50	$38,939		$77,877
	Tail wall sheets(PS31- 60')	56	ea	171024	$0.50	$85,512	$0.50	$85,512		$171,024
	Anchors (HP14 x 89- 60')	2	ea	10680	$0.50	$5,340	$0.50	$5,340		$10,680
	Wye Pile (PS31- 90')	1	ea	4581	$0.50	$2,291	$0.50	$2,291		$4,581
Reinforced Concrete	1' t	150	CY		$300	$45,000	$500.00	$75,000		$120,000
Fill		5100	CY		$10.00	$51,000	$5.00	$25,500		$76,500
									Subtotal:	$461,000
									Cost per ft^2:	**$115.25**

Note: Only variable items are considered in this estimate
Pricing based on 20' x 200' section of dock
45' Draft

EXHIBIT EE

Diana Carlson

From: Diana Carlson
Sent: Wednesday, January 31, 2007 4:22 PM
To: Winn Ryan H POA02
Cc: 'Kevin Bruce'; Michael Carter; Daniel Yuska
Subject: Ryan questions

1. Why is one dock structure type more "stable" than another at the site?
   - Because of the type of structure, Pile Supported Docks (PSD) have a higher natural frequency than Open Cell Sheet Pile (OCSP) bulkheads . The higher natural frequency often more closely matches the frequency of earthquake motions resulting in larger movements, and larger deformations during seismic events.
   - An earth fill structure, such as OCSP, has more mass (weight) than a pile supported dock. More energy is required to initiate movements in the more massive structure.
   - The center of gravity of an earth fill (OCSP) structure is closer to the natural ground, reducing the potential for earthquake motions to be magnified within the structure. Pile supported docks have most of the weight within the deck structure. Ground motions, particularly those close to the natural frequency of the structure, are magnified within the structure resulting in larger movements and greater stress on the structure.

2. Why is one more cost prohibitive?
   - PSD requires more steel and concrete than OCSP for the same amount of area; the difference in total cost is directly proportional to the cost of these two items.
   - In an OCSP system, the operational loads are basically supported by the ground, while in a PSD, the loads are supported by structural elements. (for example, it is much less expensive to build a concrete paved parking lot than to build an elevated parking structure of the same size)
   - Any increase in square footage of exposed steel greatly increases cost for required cathodic protection and power consumption.
   - Having the operational loads in an OCSP supported by the ground, makes upgrades to accommodate heavier loads much less expensive than for a structural system like PSD. Pavement on an OCSP can be designed for current loads, and heavier future loads can often be accommodated simply by increasing the thickness of the pavement. A PSD must be designed and constructed to accommodate the highest loads anticipated over the life of the structure.
   - Funding is limited for reasons provided under separate cover.

3. Is there a notable difference in global stability between PSD and OCSP?
   - Based upon information from the offshore drilling program, it was determined that the particular formation found below the Port would be stable and consequently both the OCSP bulkhead and PSD structures would withstand significant seismic events.
   - The OCSP exhibits global stability similar to a PSD, and both structures are practicable on this basis.
   - The factors of safety against global stability failure for the OCSP and PSD are similar.
   - On-going design analysis indicates the OCSP has adequate factors of safety for global stability.
   - Geotechnical analysis reports from the design phase can be provided in April 2007.

EXHIBIT FF

Koopman, Denise POA

From: Winn, Ryan H POA
Sent: Thursday, November 01, 2007 11:26 AM
To: Koopman, Denise POA
Subject: Trustees Request

-----Original Message-----
From: Blackwell, Dennis J POA
Sent: Tuesday, May 15, 2007 10:36 AM
To: Elconin, Andrea B POA; Winn, Ryan H POA
Subject: RE: Confirmation Questions for Mr. Blackwell:

Ryan and Andrea,

I will try to respond to the questions raised.

1. A 35% design is not required to adequately generate a parametric estimate for the various alternatives identified for the dock expansion. Most project alternatives are evaluated at the parametric level to rank them with respect to cost. The accuracy of the estimate is less at the parametric level but it is sufficient to determine a budgetary cost. Almost all COE projects are budgeted with almost no design.

2. I think the estimates provided for the various design alternatives are reasonable. The actual numbers could be off by 15% but the relative costs are reasonable. I think the pile supported dock will cost several times the amount of a open cell design. This is especially true since the material will be obtained from Fort Richardson at minimal cost to the Port. The composite design will be significantly higher than the open cell design and the potential for design problems associated with the composite design are much higher.

I concur with the designers on the selected alternatie.

Dennis Blackwell

-----Original Message-----
From: Elconin, Andrea B POA
Sent: Tuesday, May 15, 2007 8:22 AM
To: Blackwell, Dennis J POA
Subject: FW: Confirmation Questions for Mr. Blackwell:

Dennis, I'm going to come talk with you about this. -- Andrea

-----Original Message-----
From: Winn, Ryan H POA
Sent: Monday, May 14, 2007 4:07 PM
To: Elconin, Andrea B POA
Subject: Confirmation Questions for Mr. Blackwell:

Assuming that footprint of the dock expansion needs to occur over the waters of Knik Arm (i.e., a seaward expansion, as opposed to a landward expansion):

1. Does conceptual level design information provide sufficient information for cost estimation and comparison of design alternatives for feasibility purposes? More specifically, are 35% design detail levels necessary to provide an adequate level of information for cost estimation of alternatives? It's understood that the precision of cost estimation is directly proportionate to the level of design detail. The question is how much detail is necessary to support feasibility cost estimates.
2. Are the cost estimates provided by the Port of Anchorage for the design alternatives

EXHIBIT GG

reasonable? That is, do have reason to believe that the cost estimates are false, bloated, deflated, based on insufficient information, or otherwise questionable such that the Corps would require additional design detail and/or specific cost information to support the estimates provided?

Background:

The Corps includes information related to cost in our assessment of the practicability of design alternatives. The design alternatives being considered are the practicability of the Open Cell Sheetpile (OCSP) Dock compared to a steel pipe pile-supported dock structures.

The upper concrete surface of the dock would be similar between both the OCSP and pile-supported dock designs. However, the supporting structure of the proposed OCSP alternative would include earthen and mineral material, which would be obtained without a direct cost to the applicant (i.e., the common fill material would be relatively free), from immediately adjacent EAFB borrow pits. The inexpensive fill material would represent a substantial cost savings to the applicant, considering the substantial cost differential for construction material. According to the applicant, the cost of steel has increased substantially over the last several years and is expected to continue to rise through the construction life of the project.

According to the applicant, the construction of platform pile-supported docks capable of accommodating the anticipated truck and top-loader forklift traffic at the Port of Anchorage would vary in cost between $200/ft2 for typical truck traffic and $400/ft2 for heavy lift traffic. However, the proposed OCSP design platform is estimated to cost approximately $100/ft2 with a service life of 40 years. The applicant has generally concluded that cost/ft2 construction costs for pile-supported sections supporting the proposed large crane cargo handling operations would exceed the construction costs of the proposed OCSP design by approximately 400% and sections supporting truck traffic would exceed the OCSP alternative by 300%.

According to the applicant, the proposed OCSP project would cost approximately $375 million USD. The Corps requested cost estimates from the applicant on hybrid (i.e., partially pile supported, partially OCSP) design alternatives that incorporated steel pipe pile supported dock sections in the outer 100-ft and 50-ft of the proposed expansion footprint. According to the applicant's design team calculations, if the outer 100-feet of the dock expansion was pile supported, the construction cost of the structure would increase nearly 50 percent and a hybrid structure with the outer 50-feet pile supported would increase construction cost by $98.2 million dollars or about 25 percent.

Additionally, according to the applicant, designing a hybrid structure adds design and construction complexity considering that the two structural systems respond differently during seismic events and the long-term settlement of the two systems would be different. To prevent damages from the differential seismic and settling movements, a seismic joint that would allow independent movement between the structures and flexible utility line connections would be needed. These design considerations would further increase construction costs.

ANCHORAGE

ALASKA'S REGIONAL PORT

PORT OF ANCHORAGE

September 25, 2006

Mr. Ryan H. Winn
Project Manager
Department of the Army
U.S. Army Engineer District, Alaska
P.O. Box 6898
Elmendorf AFB, AK 99506-0898

Re: Response to Public and Agency Comments
Regulatory Branch POA-2003-502-N
DA Permit Application Phase II Port of Anchorage Intermodal Expansion Project

Dear Mr. Winn:

The purpose of the attached document is to identify and respond to comments submitted by various interested parties associated with the Phase II permit application for the Port of Anchorage (Port) expansion. The Port intends this document to promote a mutual understanding among the public and cooperating agencies of the specific issues of concern and how the Port plans to offset perceived adverse effects to the maximum extent practicable. The Port is committed to expanding its facilities in order to economically support commercial, industrial, and military intermodal operations for the benefit of Alaska and the nation. As presented in the permit application, the approach to the Port expansion is economically sound and environmentally conscious.

The Port applied for a U.S. Department of the Army (DA) permit under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 to conduct Phase II construction of the expansion, known as the Marine Terminal Redevelopment (MTR) project. In 2005, a separate Phase I permit was issued to fill 27 acres of intertidal zone; this first of two phases will be completed by late 2006. The Phase II permit application was submitted to the U.S. Army Engineer District, Alaska on January 13, 2006.

The MTR project consists of the following major activities:

- Construction of approximately 7,900 feet of waterfront structures.
- Fill of 108 acres of intertidal and subtidal zones in Cook Inlet adjacent to the existing Port.
- Major repair and improvement to the existing Port infrastructure.
- Development, operation, and reclamation of two existing borrow pits and improvements to existing unpaved roads to support associated haul operations. The two borrow pits encompass approximately 350 acres and are located adjacent to the Port on Elmendorf Air Force Base (EAFB). Development of these pits includes the re-allocation of approximately 20 acres of wetlands, intended to divert migratory birds away from the two

(907) 343-6200 Telephone • (907) 277-5636 Facsimile • http://www.ci.anchorage.ak.us Website
2000 Anchorage Port Road • Anchorage, Alaska 99501

EXHIBIT HH

active runways nearby. These borrow pits will provide most of the fill requirements for the MTR project.

In support of the Phase II permit application, the U.S. Army Corps of Engineers (USACE) issued a Public Notice of Application for Permit on January 19, 2006. Public comments on the proposed permit were solicited through February 3, 2006. Subsequently, the public comment period was extended to March 22, 2006. The USACE received eight letters during the extended public comment period for the Phase II permit application, which were forwarded to the Port for response. The Port has prepared responses to these comments by attempting to identify and summarize the concerns expressed in the following letters; cited below by date:

- NorthStar Terminal and Stevedore Company, letter dated January 30, 2006.
- Department of the Air Force, Pacific Air Forces, memorandum dated February 17, 2006.
- Joel K. Blatchford (private citizen), comment undated, received February 17, 2006.
- U.S. Department of the Interior, Fish and Wildlife Service, letter dated March 17, 2006.
- Cook Inlet Keeper, letter dated March 22, 2006.
- Native Village of Eklutna, letter dated March 22, 2006.
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, letter dated March 22, 2006.
- U.S. Environmental Protection Agency, Region 10, letter dated March 22, 2006.

As a means to respond in a complete and comprehensive manner to the public comments, the Port consolidated the concerns expressed in the correspondence by identifying seventeen common topics. The Port's response addresses each of the following topics:

- Phase II Project Definition
- Port Capacity – Purpose and Need
- Reasonable Dock-Design Alternatives
- Safety, Stability, and Independent Seismic Review
- Sedimentation and Hydrodynamics
- Fish Use of Area and Habitat Loss
- Beluga Whales
- Underwater Noise
- Shorebirds
- Endangered Species Act
- Wetlands
- Potential Contamination
- Stormwater Run-off
- Construction Schedule
- Cumulative Effects
- Mitigation
- Socioeconomic Impact

The end result of the MTR project will be a modern economical intermodal facility that will support the needs of the people of Alaska well into the current century. The project will be constructed using earth materials available in the immediate vicinity of the Port; and, upon project completion, these areas will be revegetated to enhance natural conditions. The remodeled Port facility will provide for the economical conduct of commerce by providing the following:

- Docking for larger ships that will consume fewer resources, including less fossil fuels, to efficiently transport goods, materials, and equipment into and out of Alaska.
- Transfer of goods, materials, and equipment efficiently between ship, barge, road, and rail for distribution throughout most of Alaska, as well as collection for transport out of state.
- A stable and solid facility that will withstand extraordinary seismic events.
- An environmentally sound facility with provisions to safely manage hazardous and non-hazardous materials which are currently transferred through the Port.
- Re-allocation of low-value aquatic habitat to high-value aquatic habitat by providing financial resources through mitigation.
- A safe environment for Port workers.

The Port trusts this summary will be helpful to all parties and promote a mutual understanding of this vital project. The point of contact for this document is Kevin Bruce, Director of Facility Development, Port of Anchorage, telephone 907-343-6200.

Regards,

Kevin Bruce
Director of Facility Development

Attachment: Response to Public and Agency Comments to U.S. Army Corps of Engineers Public Notice Regulatory Branch POA-2003-502-N Phase II Permit for Port of Anchorage Expansion Project areas of the dock within a short time after construction in order to provide a smooth transition between sections.

LOGISTICS

As with technological considerations, there are no logistical considerations that would prevent construction of a combined pile-supported dock/OCSP structure. However, logistical considerations favor an OCSP structure. Although these logistical differences could be overcome, they would increase the cost of the project. Logistical considerations are summarized below:

- Pile-supported portions of the structure will require more in-water construction work. The equipment necessary for performing this work is typically less available than traditional land-based equipment. The equipment for water-based work is also generally more expensive to mobilize, operate, and maintain. OCSP can be constructed using primarily land-based equipment.
- Pile-supported structures will require a larger quantity of concrete, a product currently in high demand within Alaska. It is possible that imports of cement at the current rate would not be sufficient to support the MTR project and other private, municipal, and state projects at the same time. Limitations on material availability could delay construction and increase project costs.
- The inherent limitation on load capacity could impact operational logistics by restricting the type of equipment that could be used on pile-supported sections of the dock.
- The shipping requirements for pipe pile (used for pile supported docks) are significantly greater than those for sheet pile (used for OCSP), because pipe piles require more volume; i.e., more shipments.

ENVIRONMENTAL IMPACTS (LEAST DAMAGING ALTERNATIVE)

Many of the concerns expressed by agencies and other organizations are based on the potential loss of high-value aquatic habitat. These concerns appear to be based on generalized and widely accepted concepts of aquatic habitat in the lower 48 states or elsewhere in the State of Alaska, not necessarily reflective of the unique environment of the Upper Cook Inlet Region. The concerns also do not take into account the degree to which the proposed project area has been previously impacted by current Port facilities, nearby facilities and activities, and the USACE dredging. Therefore, potential impacts from the proposed action should be evaluated as incremental impacts from the existing baseline conditions not as impacts to a pristine and previously un-impacted environment. Previous impacts have reduced the aquatic and intertidal habitat value, and the high rate of siltation, ice scour, and high tidal currents further reduce the area's value as aquatic habitat.

An OCSP structure is considered to offer the least potential for overall adverse impacts to the aquatic habitat for the following reasons:

- Although the OCSP structure would require a greater volume of fill, the fill footprint for a traditional pile-supported dock structure or for a combination pile-supported dock/OCSP structure would likely be the same, or even slightly greater. Pile-supported sections along the face of the dock would require an armored slope to prevent erosion around the piles. The armor rock typically extends beyond the face pile. OCSP construction does not require placing armor rock at the toe of the structure.
- Studies completed by the Port in support of other proposed development projects in Upper Cook Inlet indicate that the value of near-shore habitat of this water body is not comparable to the value of near-shore habitat in other aquatic environments.
- Reconstruction of the intertidal and near-shore slope underneath a pile-supported dock structure does not generally replace the littoral habitat. The density of the piles under the

ANCHORAGE
ALASKA'S REGIONAL PORT

PORT OF ANCHORAGE

September 12, 2006

Mr. Ryan H. Winn
Project Manager
Department of the Army
U.S. Army Engineer District, Alaska
P.O. Box 6898
Elmendorf AFB, AK 99506-0898

Re: Regulatory Branch POA-2003-502-N
DA Permit Application Phase II Port of Anchorage Intermodal Expansion Project

Dear Mr. Winn:

The Port of Anchorage (Port) has received your correspondence dated July 31, 2006 requesting additional information to support review of the U.S. Department of the Army (DA) permit application for Phase II of the Port Intermodal Expansion Project. This permit application is associated with work required to complete the Marine Terminal Redevelopment (MTR) project at the Port and the wetland developments associated with the Cherry Hill and the North End Runway Material Extraction and Transportation projects on Elmendorf Air Force Base (EAFB).

The proposed project involves the expansion and upgrade of the Port and includes the creation of up to 135 acres of additional surface area; the construction of 8,880 linear feet of waterfront structures; and the reorganization, upgrade, and expansion of the Port system infrastructure and support facilities. Under the Phase I permit, 27 acres have already been authorized for development. The 27 acres of development authorized under the Phase I permit represents an independent project with separate utility benefit to the Port. This project will provide additional upland area for Port activities and is not dependent on any other development or projects. To support this development two material extraction and transportation projects are required, which will develop up to 352 acres of land for material extraction. The U.S. Department of Transportation, Maritime Administration (MARAD) is the lead federal agency for the Port Intermodal Expansion Project. MARAD has prepared Final Environmental Assessments (EAs) in compliance with National Environmental Policy Act (NEPA) guidelines for these projects and issued Findings of No Significant Impact. The project involves work within the waters of the U.S. under DA regulatory jurisdiction. The Port has applied for DA Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The Phase II permit application was submitted to the U.S. Army Engineer District, Alaska on January 13, 2006.

The Port and MARAD are aware Section 404 guidelines require all practicable and reasonable steps be taken to reduce the amount of fill material placed within waters of the U.S. and to (see cost details in Attachment 1), a combination structure consisting of a 50-foot-wide section of pile supported platform dock in front of an OCSP section will increase the construction cost by $98.2 million, nearly a 25 percent increase from the current estimated cost. A 100-foot-wide section of pile supported dock section would represent nearly a 50 percent increase in cost. Any increase in cost would exceed current funding levels for the project. For a project that is expected to take at least six years to complete, current inflationary trends in construction material costs will increase the budget demands over the life of the project. As the increase in steel and concrete costs in recent years has far exceeded the increase in cost for earth materials, the cost differential is likely to further inflate over the life of the project.

- Typical truck traffic has a 16 to 20 ton axle load while current top-loader forklifts require a 100-ton front axle which can only be accommodated on a platform dock at considerable expense. The typical cost of platform structures for typical truck traffic is about $200 per square foot. With heavier axle loads per square foot values are exceeding $300 per square foot, making them prohibitively expensive. A recently performed cost estimate by the waterfront design team for a heavy lift dock located elsewhere in Cook Inlet exceeded $400 per square foot. Designing any pile supported dock for heavier loads for equipment currently in use or that may come into use in the future would far exceed the level of funding available for this project. Accommodations of greater loads in the future are a function of pavement performance and not performance of the structure itself. It is anticipated the OCSP structure as currently planned will provide a useful service life of 40 years or more at a cost of around $100 per square foot for this project. Dramatically increasing axle loads could be accommodated by upgrading areas of pavement at a fraction of the cost of upgrading a pile supported dock.
- The use of two different structures in conjunction will add additional design and construction costs. The two structural systems will respond differently during seismic events and long term settlement of the two systems will be different. In order to prevent damages from differential movement, a seismic joint will be required allowing the structures to move independently of each other to avoid damage. Utilities that cross from the OCSP section to the pile supported section(s) will require flexible connections that can accommodate both seismic movement and differential settlement between the two structures. Providing a flexible seismic joint between the different structures will also increase the need to add structural elements to the pile supported sections to provide adequate internal stability. These additional costs are excluded from the estimate used for the comparison presented above.
- Dredging Costs: Although the project will not bear the cost of dredging the harbor to the final operational depth of -45 feet Mean Lower Low Water (MLLW), this work cannot be completed until funding is available to the USACE. The OCSP system can be installed and put into service with the current harbor depth of -35 feet MLLW. Dredging to -45 feet MLLW can take place at any time; before, during, or after construction. Harbor deepening could be completed several years after construction with no impact on the project. Pile supported deck sections require an armor covered slope extending from the outside of the face pile back to the sheet pile supported section. The armor slope protects the structural piles from erosion and over-dredging. The slope is generally constructed prior to driving the support piles and the armor rock is placed after pile driving and before deck construction. This construction sequence will require the harbor

- "The limited data gathered with the bubble curtain in place indicated that there was no reduction in the overall linear sound level, the basis for the NMFS criterion level, as a result of the bubble curtain. It was effective in attenuating the higher frequency component of the noise (above 800 Hz). It also changed the shape of the impulse. It should be noted that the water was relatively deep and currents were strong when data were gathered for the bubble curtain conditions." Final Data Report: Noise and Vibration Measurements Associated with the Pile Installation Demonstration Project for the San Francisco-Oakland Bay Bridge Ease Span, May 21, 2001. Prepared by Illingwarth & Rodkin, Inc.
- However, an unconfined bubble curtain can be disrupted and rendered ineffective by currents greater than 1.15 miles per hour (Christopherson and Wilson, 2002) cited in the Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, Revised Standard Local Operating Procedures for Endangered Species (SLOPES III) to Administer Certain Activities Authorized or Carried Out by the Department of the Army in the State of Oregon and on the North Shore of the Columbia River, November 30, 2004.
- "Regulators feared that the fast-moving Carquinez would scatter an air bubble curtain except during slack tide, or when the current moves at less than 1 Knot. State tests, however, show that the curtain remains intact at speeds twice that amount." Further, "Bridge Officials: Bubbles save fish from noise," Lisa Vorderbruegen, The Contra Costa Times, February 1, 2003. (Note: Current velocities in Upper Cook Inlet are on the order of 2-7 Knots depending on location and period of tide cycle).

CONCLUSION

As demonstrated by the information provided herein and in the MTR EA, the construction of an OCSP structure to meet the identified purpose and need provides the best overall value while reducing impacts to the existing environment. The Port and MARAD will continue to refine the design of the proposed action, as appropriate, to reduce the amount of fill placed in the waters of the United States, and to avoid, minimize, and/or mitigate identified potential impacts, and to provide information and support to USACE toward the goal of final permit approval.

Regards,

Todd C. Cowles for

Kevin Bruce
Deputy Port Director

CC:

Attachments: 1. OCSP and Pile Supported Dock Cost Comparison
2. OCSP Construction Joint Detail
3. Underwater Demolition Expert Letter
4. NOAA Letter
5. Whale Sighting Form

Anchorage Port Expansion Team

TEC Infrastructure Consultants

Project No.: 6508.014
Date: July 02, 2004
Revision: 1
By: MDV

PORT OF ANCHORAGE MARINE TERMINAL REDEVELOPMENT
OPEN CELL SHEETPILE
OPINION OF PROBABLE COST - OVERALL ESTIMATE
ALTERNATIVE 3 - WHARFLINE PARALLEL TO & 400 FEET FROM EXISTING WHARF

		UNITS	QUANTITY	$/UNIT	$/UNIT	Total	Total
1	**DEMOLITION**			Low Estimate	High Estimate	Low Estimate	High Estimate
2	Demolition Existing Wharves	sqft	335,000	$15	$25	$5,025,000	$8,375,000
3	Demolition POL 1	sqft	20,700	$15	$25	$310,500	$517,500
4	Demolition POL 2	sqft	12,300	$15	$25	$184,500	$307,500
5	Demolition POL Trestles	sqft	19,800	$15	$20	$297,000	$396,000
6	Demo/Remove Existing Admin & Transit Shed Building	sqft	44,640	$5	$10	$223,200	$446,400
7	Misc. Demolition	LS	0			$0	$0
8	**Demolition Sub-total**					**$6,040,200**	**$10,042,400**
9							
10	**DREDGING**	cuyd	5,334,259	$4	$6	$21,337,036	$32,005,554
11	**Dredging Sub-total**					**$21,337,036**	**$32,005,554**
12							
13	**BACKLANDS**						
14	Engineered Fill for Cells	cuyd	6,349,191	$9.00	$12.00	$57,142,719	$76,190,292
15	Other Fill	cuyd	4,289,223	$9.00	$12.00	$38,603,007	$51,470,676
16	Vibro Compaction	acre	72	$45,000	$45,000	$3,240,000	$3,240,000
17	**Backlands Sub-total**					**$98,985,726**	**$130,900,968**
18							
19	**OPEN CELL SHEETPILE WHARF**						
20	Steel Sheetpile Material (8,880 feet long)	tons	72,524	$1,100	$1,100	$79,776,400	$79,776,400
21	Steel Sheetpile Installation	linft	8,880	$1,000	$1,000	$8,880,000	$8,880,000
22	Steel Sheetpile Coating	sqft	816,113	$5	$5	$4,080,563	$4,080,563
23	Cathodic Protection	linft	8,880	$900	$900	$7,992,000	$7,992,000
24	Install Riprap for Toe Protection	cuyd	6,867	$64	$76	$439,467	$521,867
25	Concrete Face Beam	linft	8,880	$350	$500	$3,108,000	$4,440,000
26	Fenders	linft	8,880	$200	$300	$1,776,000	$2,664,000
27	Bollards and Marine Fittings	linft	8,880	$20	$30	$177,600	$266,400
28	**Sheetpile Wharf Sub-total[2]**					**$106,230,029**	**$108,621,229**
29							
30	**BACKLAND UTILITIES**						
31	Grading & Stormwater Drainage	acre	132	$15,000	$20,000	$1,981,500	$2,642,000
32	Potable Water & Sanitary Sewer	acre	132	$6,000	$7,500	$792,600	$990,750
33	Fire Protection	acre	132	$2,500	$3,500	$330,250	$462,350
34	**Backland Utilities Sub-total**					**$3,104,350**	**$4,095,100**
35							
36	**PAVEMENT**						
37	Sub-base (Included in backland estimate)	acre	0	$0	$0	$0	$0
38	8" Base	acre	135	$32,000	$37,000	$4,313,600	$4,987,600
39	Asphaltic Concrete Pavement	acre	135	$45,000	$65,000	$6,066,000	$8,762,000
40	**Pavement Sub-total**					**$10,379,600**	**$13,749,600**
41							
42	**Container Crane Runway**						
43	Piling	linft	28,980	$100	$100	$2,898,000	$2,898,000
44	Concrete Pilecaps	cuyd	950	$400	$500	$380,000	$475,000
45	Crane Rail Support Beams	linft	4,750	$250	$325	$1,187,500	$1,543,750
46	Crane Rail Assembly	linft	4,750	$75	$100	$356,250	$475,000
47	Crane Storm Anchors	ea	12	$10,000	$10,000	$120,000	$120,000
48	Crane End-of-Rail Stops	ea	4	$5,000	$5,000	$20,000	$20,000
49	**Container Crane Runway Sub-total**					**$4,961,750**	**$5,531,750**
50							
51	**Electrical**						
52	Lighting High Mast	acre	135	$9,000	$11,000	$1,213,200	$1,482,800
53	Crane Power	LS	1	1,000,000	1,500,000	$1,000,000	$1,500,000
54	Secondary Distribution	LS	1	1,000,000	1,500,000	$1,000,000	$1,500,000
55	Reefer Plugs (By Tenants)	ea	0	$1,600	$2,000	$0	$0
56	*Power supply, transformers, by Utility Co.*						
57	**Electrical Sub-total**					**$3,213,200**	**$4,482,800**

EXHIBIT II

Poart of Anchorage Expansion
Comparison of Sheet Pile vs. Pile Supported Construction
Based on an Estimate by Tech Icon Inc. completed in 2004 and updated with 2007 unit pricing.

OPEN CELL SHEETPILE WHARF	Unit	Quantity	Unit Cost	Total
Steel Sheetpile Material (8,880 feet long)	tons	72,524	$1,500	$108,786,000
Steel Sheetpile Installation	linft	8,880	$831	$7,379,280
Cathodic Protection / Coatings	linft	8,880	$600	$5,328,000
Install Riprap for Toe Protection	cuyd	6,867	$120	$824,000
Concrete Face Beam	linft	8,880	$1,350	$11,988,000
Fenders	linft	8,880	$1,282	$11,384,160
Bollards and Marine Fittings	linft	8,880	$244	$2,166,720
Engineered Fill for Cells	cuyd	6,349,191	$8.35	$53,015,745
Other Fill	cuyd	4,289,223	$6.07	$26,035,584
Vibro Compaction	acre	72	$126,000	$9,072,000
Sheetpile Wharf Sub-Total				$235,979,488

PILE SUPPORTED WHARF	Unit	Quantity	Unit Cost	Total
Steel Piles	linft	629,244	$593	$373,141,692
Concrete Pile Caps	cuyd	27,969	$762	$21,312,293
Concrete Deck	cuyd	67,018	$762	$51,067,547
Steel Sheetpile Bulkhead (material)	tons	270	$1,500	$404,472
Steel Sheetpile Installation	linft	8,870	$831	$7,370,970
Cathodic Protection / Coatings	linft	8,870	$600	$5,322,000
Fenders	linft	8,870	$1,282	$11,371,340
Bollards and Marine Fittings	linft	8,870	$244	$2,164,280
Rock	cuyd	3,707,660	$24.00	$88,983,840
Other Fill	cuyd	3,610,914	$6.07	$21,918,248
Vibro Compaction	acre	30	$126,000	$3,787,560
Pile Supported Wharf Sub-Total				$586,844,242

EXHIBIT JJ

ABSTRACT OF BIDS/OFFERS

Project:	2007 Marine Terminal Redevelopment				
Solicitation No.:	4406-2-S72	Closing Date and Time:	2:00 P.M.	14 August 2007	
		Bidder/Offeror # 1	Bidder/Offeror # 2	Bidder/Offeror # 3	
Name & Address		QAP	Alaska Interstate Construction, LLC	Kewitt	
of		240 W 68th Avenue	601 W 5th Avenue, Suite 400	PO Box 1769	
Bidder/Offeror		Anchorage, AK 99518	Anchorage, AK 99501	Vancouver, WA 98668	
Date/Time Rec'd					

Item	QTY	Unit	Description	Bidder/Offeror # 1 Unit Price	Bidder/Offeror # 1 Total Amount	Bidder/Offeror # 2 Unit Price	Bidder/Offeror # 2 Total Amount	Bidder/Offeror # 3 Unit Price	Bidder/Offeror # 3 Total Amount
1a	1	LS	Bonds		$200,000.00		$165,047.33		$50,000.00
1b	1	LS	Insurance		$200,000.00		$228,800.00		$50,000.00
2	1	LS	Mobilization / Demobilization		$1,000,000.00		$658,500.00		$2,200,000.00
3	1	LS	Removal of Structures & Obstructions		$50,000.00		$19,500.00		$1,500,000.00
4	1	LS	Temp Erosion & Pollution Control		$50,000.00		$13,700.00		$60,000.00
5-A	1	LS	Construction Surveying		$150,000.00		$81,300.00		$200,000.00
5-B	1	LS	OCPS Geo tech Surveying & Monitor		$75,000.00		$0.01		$50,000.00
6	1	LS	Traffic Control		$200,000.00		$112,000.00		$30,000.00
7	1	LS	Pile Probing		$400,000.00		$284,000.00		$500,000.00
9-A	2391	TN	Sheet Pile Supplied	$ 2,000.00	$4,782,000.00	$ 2,523.00	$6,032,493.00	$ 2,500.00	$5,977,500.00
10-A	452000	CY	Granular Fill	$ 7.50	$3,390,000.00	$ 13.51	$6,106,520.00	$ 12.00	$5,424,000.00
10-B	10000	CY	Common Fill	$ 10.00	$100,000.00	$ 7.03	$70,300.00	$ 5.00	$50,000.00
10-C	30000	CY	Compaction Above +30 Mean Lower Low	$ 2.00	$60,000.00	$ 0.01	$300.00	$ 0.01	$300.00
10-F	10000	CY	Compaction Between +24 and +30	$ 3.00	$30,000.00	$ 5.00	$50,000.00	$ 0.01	$100.00
11-A	11000	TN	Filter Rock	$ 45.00	$495,000.00	$ 0.01	$110.00	$ 24.00	$264,000.00
11-B	28000	TN	Armor Rock	$ 75.00	$2,100,000.00	$ 38.60	$1,080,800.00	$ 39.00	$1,092,000.00
11-D	42000	TN	Riprap, Pit Run	$ 45.00	$1,890,000.00	$ 0.01	$420.00	$ -	$0.00
11-E	52000	CY	Salvage Rock	$ 10.00	$520,000.00	$ 8.33	$433,160.00	$ 71.00	$3,692,000.00
14-B	3200	LF	Coir Logs	$ 15.00	$48,000.00	$ 11.04	$35,328.00	$ 10.00	$32,000.00
14-C	1	LS	Instrumentation		$50,000.00		$37,500.00		$445,000.00
			DRY BARGE BERTH TOTAL		$15,790,000.00		$15,409,778.34		$21,616,900.00
10-A	60000	CY	Granular Fill	$ 5.00	$300,000.00	$ 17.69	$1,061,400.00	$ 4.00	$240,000.00
10-B	2000	CY	Common Fill	$ 10.00	$20,000.00	$ 6.57	$13,140.00	$ 5.00	$10,000.00
10-D	62000	CY	Compaction	$ 2.00	$124,000.00	$ 0.83	$51,460.00	$ 0.01	$620.00
11-C	15000	TN	Riprap, Graded	$ 60.00	$900,000.00	$ 29.85	$447,750.00	$ 27.00	$405,000.00
11-D	15000	TN	Riprap, Pit Run	$ 45.00	$675,000.00	$ 24.60	$369,000.00	$ -	$0.00
14-B	1450	LF	Coir Logs	$ 15.00	$21,750.00	$ 11.04	$16,008.00	$ 10.00	$14,500.00
14-D	1	LS	Cement Pipeline Crossing		$30,000.00		$33,878.66		$75,000.00

EXHIBIT KK

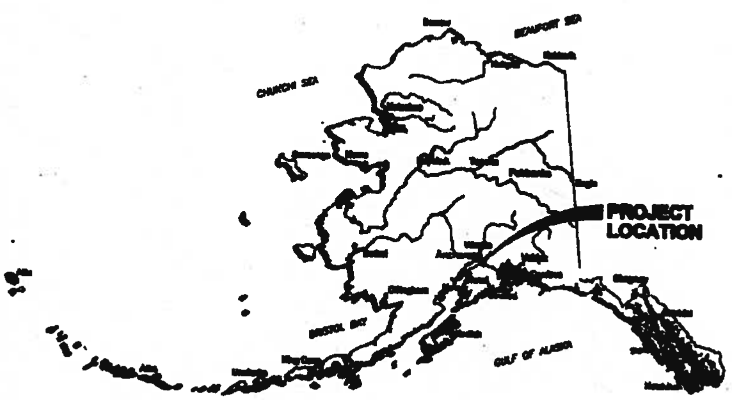
ABSTRACT OF BIDS/OFFERS

Project:	**2007 Marine Terminal Redevelopment**				
Solicitation No.:	**4406-2-S72**	Closing Date and Time:	**2:00 P.M.**	**14 August 2007**	
	SOUTH BACKLANDS TOTAL	$2,070,750.00	$1,992,636.66		$745,120.00
	DRY BARGE	$15,790,000.00	$15,409,778.34		$21,616,900.00
	SOUTH BACKLAND	$2,070,750.00	$1,992,636.66		$745,120.00
	TOTAL COMBINED BID PRICE	$17,860,750.00	$17,402,415.00		$22,362,020.00
Comments					

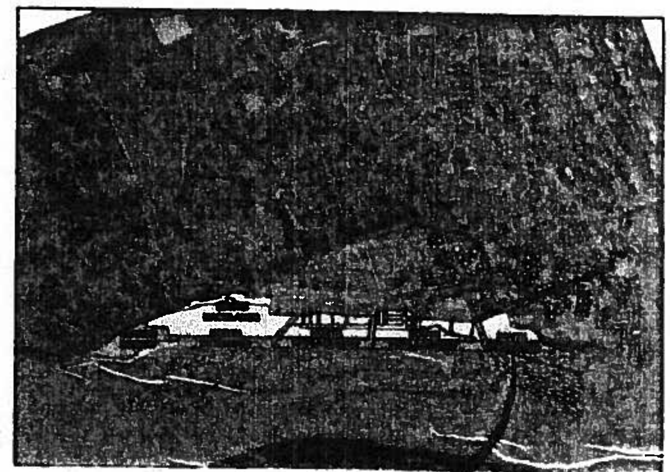
PORT OF ANCHORAGE EXPANSION PROJECT

SEPTEMBER 2006
ANCHORAGE, ALASKA
SOUTH EXTENSION DRAWINGS

SHEET INDEX



STATE OF ALASKA



PORT OF ANCHORAGE VICINITY

35% DRAWINGS
SEPTEMBER 6, 2006

ICRC
Anchorage Port Expansion Team

PND ENGINEERS, INC.

PORT OF ANCHORAGE EXPANSION PROJECT

SOUTH EXTENSION COVER

XX

XX

EXHIBIT LL

PHASING, DREDGING AND MATERIALS TABLE ROM

FOOTPRINT	YEAR	PROJECT TASK	CONSTRUCTION DREDGING (CY)	STRUCTURAL FILL (CY)	COHESION FILL (CY)	SHEET PILE (TONS)	COMMERCIAL ACRES	MISC.
NORTH BACKLANDS	2006	BY OTHERS			600,000		21	
SOUTH EXTENSION	2007	1,050' BULKHEAD AND FILL	160,000	700,000	350,000	6,800	30	
BARGE BERTHS	2007	500' BULKHEAD AND FILL, DRY BARGE BERTH LANDING PREPARATION	60,000	600,000	20,000	2,200	21	ROCK:65,000 TON ARMOR, 26,000 TON FILTER
SOUTH EXTENSION	2008	1,050' DOCK FACE, FINISH UTILITIES, POL & GRADING, USACE -35 SOUTH END DREDGE		60,000				USACE DREDGING ~400,000 CY @-35'
BARGE BERTHS	2008	FINISH UTILITIES & GRADING		70,000				
NORTH EXTENSION	2008	1,800' BULKHEAD AND FILL	110,000	640,000	220,000	12,000	21	
NORTH EXTENSION	2009	1,800' DOCK FACE, 1000' CRANE RAILS, USACE -25/-35 NORTH END DREDGE		70,000				USACE DREDGING ~650,000 CY @-25',@-35'
NORTH REPLACEMENT	2009	DEMO EXISTING BUILDINGS & DOCK						DEMO 150,000 SF
NORTH REPLACEMENT	2010	2000' BULKHEAD AND FILL	220,000	2,000,000	700,000	14,000	22	
SOUTH REPLACEMENT	2010	DEMO EXISTING BUILDINGS & DOCK						DEMO 250,000 SF
SOUTH REPLACEMENT	2011	2230' BULKHEAD AND FILL	330,000	2,000,000	1,000,000	14,000	30	
NORTH REPLACEMENT	2011	2000' DOCK FACE, POL PIPING EXTEND TO VALVE YARD		90,000				
SOUTH REPLACEMENT	2012	2230' DOCK FACE, USACE -45 HARBOR DEEPENING DREDGE		100,000				USACE DREDGING ~800,000 CY @-45'
TOTAL			[illegible]	[illegible]	[illegible]	[illegible]	135	

OPEN CELL TWIST (ALTV) ...

35% DRAWINGS
SEPTEMBER 6, 2006

ICRC
Anchorage Port Expansion Team

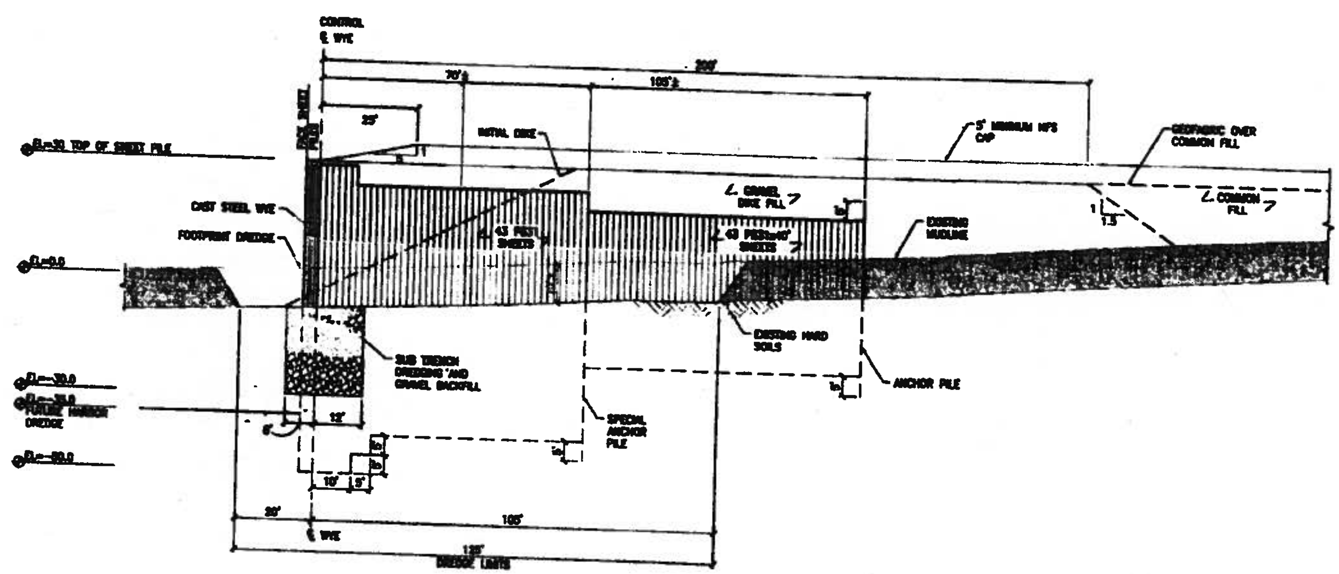
1305 West 36th Avenue
Anchorage, Alaska 99503
Phone 907.561.1011
Fax 907.563.4220
www.pndengineers.com

PND ENGINEERS, INC.

PORT OF ANCHORAGE
EXPANSION PROJECT

SOUTH EXTENSION
ESTIMATED QUANTITIES

XX of XX



SECTION D-D

SCALE IN FEET
0 15 30 45 60

35% DRAWINGS
SEPTEMBER 6, 2006

ICRC
Anchorage Port Expansion Team

PND ENGINEERS, INC.

PORT OF ANCHORAGE EXPANSION PROJECT

SOUTH EXTENSION
TYPICAL SECTION D-D

XX of XX

Port of Anchorage Marine Terminal Expansion Project

Design Alternative Selection Process Presentation

May 5, 2005

Anchorage Port Expansion Team

EXHIBIT MM

Stability Constraints

- Corrosion/Cathodic Protection
  - Upper Cook Inlet has been identified as the world's most corrosive environment
  - Steel has to be coated and/or cathodically protected
  - Minimization of Steel Surface Area minimizes both cost, and the probability of localized failure from corrosion

  - Alternative A has 8,880,000 square feet of area to be coated and cathodically protected.
  - Alternative B has 12,870,000 square feet of area to be coated and cathodically protected.
  - The Intertidal Reconstruction has 16,880,000 square feet of area to be coated and cathodically protected.

ALTERNATIVE A: OPEN CELL SHEET PILE CONSTRUCTION

Cost to Construct

• Infrastructure – water, utilities, road, rail, buildings	$47 million
• Pavement – 185 acres @ $112,400 per acre	$21 million
• Cranes – 4 cranes @ $12.8 million each	$51 million
• Dredging – 6.7 million cubic yards	$15 million
• Steel Sheet Piles and Wharf Construction – 8,880 feet long	$83 million
• Fill – 12 million cubic yards	$126 million
• Cathodic Protection – 8,880,000 sq-ft	$57 million
• TOTAL	$400 MILLION

ALTERNATIVE B: PILE SUPPORTED DOCK
Cost to Construct

- Infrastructure — $47 million
  - water, utilities, road, rail, buildings
- Pavement — $21 million
  - 185 acres @ $112,400 per acre
- Cranes — $61 million
  - 4 cranes @ $12.8 million each and support structures
- Dredging — $15 million
  - 6.7 million cubic yards
- Steel Sheet Piles — $83 million
  - 8,870 feet long
- Steel Pipe Piles and deck construction — $108 million
  - 4,000 pipe piles @ $15,000 each = $60 million
  - Concrete deck = $48 million
- Fill — $99 million
  - 9 million cubic yards plus armor rock
- Cathodic Protection — $82 million
  - 8,870,000 sq-ft + 4.000,000 sq-ft
- **TOTAL** — **$516 MILLION**

INTERTIDAL RECONSTRUCTION APPROACH: PILE SUPPORTED DOCK

Cost to Construct

- Infrastructure — $47 million
  - water, utilities, road, rail, buildings
- Pavement — $21 million
  - 185 acres @ $112,400 per acre
- Cranes — $61 million
  - 4 cranes @ $12.8 million each and support structures
- Dredging — $15 million
  - 6.7 million cubic yards
- Steel Sheet Piles — $83 million
  - 8,880 feet long
- Steel Pipe Piles and deck construction — $205 million
  - 8,000 pipe piles @ $15,000 each = $120 million
  - Concrete deck = $85 million
- Fill — $170 million
  - 16 million cubic yards plus armor rock
- Cathodic Protection — $108 million
  - 8,880,000 sq-ft + 8,000,000 sq-ft

- **TOTAL** — **$710 MILLION**

03-15
5/2006
9122

Request for a Letter of Authorization to Allow the Incidental Take of Marine Mammals during Phase II Construction Activities Associated with the Port of Anchorage Marine Terminal Redevelopment Project January 1, 2007 – October 31, 2012

Submitted by:
U.S. Department of Transportation
Maritime Administration
400 Seventh Street, S.W.
Washington, D.C. 20590
and
Port of Anchorage
2000 Anchorage Port Road
Anchorage, AK 99501

ANCHORAGE
ALASKA'S REGIONAL PORT

Submitted to:
National Marine Fisheries Service
Office of Protected Resources
1315 East-West Hwy
Silver Spring, MD 20910-3282

Application prepared by:
TEC, Inc.
250 Bobwhite Court, Suite 200
Boise, ID 83706

Anchorage Port Expansion Team

May 2006

EXHIBIT NN

TABLE OF CONTENTS

INTRODUCTION

National Marine Fisheries Service (NMFS) regulations governing the issuance of Letters of Authorization (LOAs) permitting incidental takes of marine mammals under certain circumstances are codified in 50 Code of Federal Regulations Part 216, Subpart I (Sections 216.101-216.108). The Marine Mammal Protection Act (MMPA) defines "take" to mean to "harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" (16 United States Code (USC) Chapter 31, Section 1362(13)). Section 216.104 sets out 14 specific items that must be addressed in requests for rulemaking and renewal of regulations pursuant to Section 101(a)(5) of the MMPA. The Port of Anchorage (POA) and the U.S. Department of Maritime Administration (MARAD) request a LOA for the incidental take of marine mammals during Phase II construction of the Marine Terminal Redevelopment Project (Project) from January 1, 2007 through October 31, 2012. As part of that request, each of the 14 items pursuant to Section 101(a)(5) of the MMPA is addressed in detail.

1. Activities to be Conducted

A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.

Overview of the Marine Terminal Redevelopment Project

The activity addressed in this LOA application is part of the expansion of the POA in Anchorage, Alaska. Located in the Municipality of Anchorage in Upper Cook Inlet, the POA occupies approximately 129 acres and is currently operating above sustainable practicable capacity. Figure 1 shows the POA vicinity and surrounding Project area. The Project includes a variety of activities to enhance the transportation of goods and people within the State of Alaska. Potential expansion activities are scheduled to take place over approximately the next seven years (2006 to 2012), using federal funding administered by (MARAD). The Project would expand, reorganize, and improve the POA by:

- Demolishing and replacing structures that are degraded, decayed, or functionally obsolete;
- Providing barge dock capacity;
- Expanding commercial dock space to meet unfilled present and future demands;
- Upgrading functionally obsolete cranes to enable a full reach across ship beams;
- Providing the additional land and facilities necessary to support military rapid deployment from Alaska's bases, including the U.S. Army Stryker Brigade Combat Team (SBCT) and Airborne Brigade Combat Team Sealift Operations;
- Improving landside traffic circulation and intermodal surface freight operations;
- Replacing and relocating code-compliant POA support structures and buildings and developing warehouse storage;
- Developing a secured cruise ship terminal to accommodate passengers and baggage screening in accordance with new Department of Homeland Security mandates;
- Providing rail connection to the waterfront for commercial and military intermodal transfers; and
- Installing state-of-the-art security and lighting controls in accordance with the new Maritime Security mandates.

attached to the top of the probe, likely an H-pile or steel pipe pile. Vibrocompaction is expected to occur during the second half of the summer construction season.

Only the face sheets would involve actual pile driving within the water column. All tail sheets would be installed after the face sheets have been installed and fill has been placed behind the installed face sheets. Therefore, although sound associated with the pile drivers will still propogate into the water column during installation of the face sheets, it is predicted that it will be measurebly less than the in-water sound levels produced during installation of the face sheets. Sound levels during installation of OCSPs and fender and crane piles are discussed in Section 4.

Cranes. For the OCSP dock, the crane beams will be supported on piling that will be driven through the fill. This would be accomplished utilizing a vibratory pile driver attached to a crane for the first 50 percent of the pile and an impact pile driver attached to the same crane for the remaining 50 percent. On average, it is expected to take 1 hour of vibratory pile driving and 1 hour of impact pile driving for each crane support pile. Two crane rail piles would be installed every 20 ft along approximately 4,800 ft of dock face from the Center-Central waterfront area north to the North waterfront area (Table 3). These piles would be approximately 2 ft in diameter and 100 ft high. Various options exist for the type of piles that can be used for the crane beams, including steel pipe piles, H-piles, precast concrete piles, and auger-cast (or cast-in-place) concrete piles. All of the crane rail pile driving would be done behind the OCSP bulkhead, rather than in open water, utilizing land-based equipment. Crane support piles would be fully embedded in the fill material.

Table 3. Crane Rail Piling Over Life of Project

Year	*Face Length (ft)*	*Number of Piles*	*Length of Pile (ft)*
2007	2,075	208	31,200
2008	0	0	0
2009	1,200	120	18,000
2010	0	0	0
2011	1,525	154	23,100
Total	**4,800**	**482**	**72,300**

Fendering System. A floating fender is proposed for the Project. Fendering would be free to move vertically with the tide; allowing the ships to make contact with the fender at any tide level. Panels will be secured to the fender piles to provide a smooth contact surface for the fender. The fendering system will be offset from the main structure and will occupy the length of the structure through the tidal zone and below.

Pipe piles would be driven for attaching panels and fenders in the front of the dock. This would be accomplished utilizing a vibratory pile driver for the first 50 percent of the pile and an impact pile driver for the remaining 50 percent. On average, it is expected to take 1 hour of vibratory pile driving and 1 hour of impact pile driving for each fender pile. Two fender piles would be placed approximately every 32 ft along the entire face of the newly constructed 8,800 ft of OCSP dock (Table 4). These piles would be approximately 2 ft in diameter and 150 ft long. The fender piles would be driven in the open water in front of the OCSP face utilizing a land-based crane with vibratory and impact unit attachments. Only half of the length of the fender piles would be embedded, with the remaining portion freestanding for attachment of panels and fenders.

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ENGINEERS, INC.

July 17, 2007

PND 061028

Chuck Casper
Project Manager
Integrated Concepts & Research Corp.
421 W. 1st Ave. #200
Anchorage, AK 99501

Subject: **Giken Method of Pile-Pressing**

Chuck,

At your request PND Engineers, Inc. (PND) looked into the feasibility of the press-in method of sheet pile installation, developed by Giken America Corporation (Giken), for the Port of Anchorage (POA) Expansion project. After reviewing technical information on the press-in method that utilizes Giken's "Silent Piler" robotic machine and contacting their Western Regional Manager Mr. Taka Sakai in the Los Angeles office, PND does not think the press-in pile installation method is feasible for the project.

The main advantage of the press-in method over conventional methods is reduced ground vibration and noise during pile installation since vibratory and percussive energy is not relied on. Rather, the reaction force developed from negative (pull-out) skin friction and interlock resistance of previously installed sheet piles is relied on to provide press-in force to hydraulically jack subsequent sheet piles into the ground and resist the generated equal and opposite uplift force on the "Silent Piler" machine. In addition, it is possible to use Giken's "Silent Piler" machines to install flat sheet piles in a curvilinear shape.

Pertaining to the POA Expansion, the Giken press-in method of pile installation has many disadvantages that deem it unfeasible. Disadvantages include the following:

- Installation of flat sheet piles is relatively unproven. According to Mr. Sakai, there is only one "Silent Piler" machine in the world that can be adjusted to fit flat sheets and has been used very few times (only in Japan) to install flat sheet piles up to 40 feet in length. The installations typically took place in very loose silty sand having Standard Penetration Test (SPT) N-values of 5-10 blows per foot. Soils at the POA Expansion site are expected to be dense and may even require trenching for sheet pile installation in certain areas. Also, a low production rate of 10 fully-installed sheet piles per day was realized even utilizing a water jetting system to aid in installation.

- Because only one machine capable of installing flat sheet piles is available, the Contractor would be prevented from using two crews per shift for sheet pile installation.

- The free-standing "Silent Piler" machine, which weighs approximately 10 tons, could not remain stable on top of the tall face sheet piles without external support, such as being suspended from a crane. The viability of this operation method is unknown.

1506 WEST 36TH AVENUE · ANCHORAGE, ALASKA 99503 · Phone 907.561.1011 · Fax 907.563.4220

EXHIBIT OO

- According to Mr. Sakai, the "Silent Piler" machine capable of installing flat sheet piles is not available in the U.S. until November 2007, which potentially precludes using it for the upcoming Barge Berths portion of the project. Giken does not anticipate selling the machine in the next year, and the cost for renting the machine and an instructor is $5,500 per day (approximately $165,000 per month).

- If required to use relatively unproven and unfamiliar (training is required to operate the "Silent Piler" machine) methods, potential Contractors bidding on the project will most-likely significantly increase their bids.

- According to Mr. Sakai, Giken does not think flat sheet piles of the length required for the POA Expansion can be installed using the press-in method.

As aforementioned, given the weight of disadvantages and recommendation of Giken, PND does not think the press-in method of pile installation is feasible for the project.

If you have questions, comments, or need anything further feel free to contact us.

Sincerely,
PND Engineers, Inc. | Anchorage Office

Garth K. Howlett, P.E.
Senior Engineer

Derrick D. Honrud, E.I.T.
Staff Engineer

Enclosures
1. E-mail correspondence from Giken America Corp.

Derrick Honrud

From: Takayuki SAKAI/Giken [tsakai@gikenamerica.com]
Sent: Monday, July 09, 2007 4:18 PM
To: Derrick Honrud
Subject: RE: Requested Soils Info - Silent Piler - Anchorage, AK

Derrick,

Thanks for sending the boring data.
We found few experience to install flat sheets, 40' in length in JAPAN.
We install flat sheet around oil tank circularly caused protecting from liquefaction of ground by potential earthquake.
The soil condition was very loose silty sand which N-value was 5~10 and the production of piling was 10pcs per day using our piling machine with water jetting system. That is quite low number.
In addition, the exposed height in the sheet pile driven is high too much. Our machine has 10ton weight and machine need to stable on the sheet pile for piling operation.
Basically, the operation to install flat sheet is quite difficult to keep sheet vertical within acceptable tolerance. When we install flatsheet, we make sure to check sheet pile's verticality by level and laser pointer and try to keep using minimum press-in force, otherwise the sheet would be bend.

We have the machine for U-shape sheetpile in USA and the machine is adjustable to fit flat sheets. Machine is available from November this year. The cost of the piling machine and instructor is USD6500/day for renting. Shipping fee from Japan to USA is approximately USD80,000 per trip. We do not anticipate selling this machine in this year.

However, based on our investigation, we are sorry to say we do not think we can install 75' flat sheet under the circumstance.

If the design would be able to change or you have the question on that, please do not hesitate to call any time.

Sincerely,

/_/
Taka SAKAI
Western Regional Manager
tsakai@gikenamerica.com.

Giken America Corporation.
Los Angeles Office
3858 Carson Street Suite 201
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Mobile: (213)327-4504
www.gikenamerica.com
/_/

From: Derrick Honrud [mailto:derrick@pnd-anc.com]
Sent: Saturday, July 07, 2007 8:33 PM
To: tsakai@gikenamerica.com
Cc: Garth Howlett; Alan Christopherson
Subject: Requested Soils Info - Silent Piler - Anchorage, AK

Taka,

Per our conversation, attached is some soils information (borings, CPT, and geophysical sub-bottom profile) for our project. The max wall height is approximately 75', with less than half that length needed to be driven. Again, we are using flat steel sheet piles (PS31 and PS27.5).

Please let us know the suitability of the flat sheet Silent Piler (available from Japan) for out project which utilizes flat steel sheet piles driven in a curvilinear shape to form a membrane retaining structure. Also please provide rental rates, schedule, and if it is possible to purchase the flat sheet Silent Piler, per our earlier conversation.

Thanks for your assistance, let us know if you need anything else.

Regards,

Derrick D. Honrud | Staff Engineer
P|N|D Engineers, Inc.
1506 W. 36th Ave • Anchorage, Alaska 99503
p. 907.561.1011 • f. 907.563.4220
www.pndengineers.com

Mike Frank

From: Mike Frank
Sent: Wednesday, September 05, 2007 1:47 PM
To: Winn, Ryan H POA
Subject: RE: Port of Anch

Ryan,

I apparently misunderstood the COE Decision Document, § 8.5 at p. 105, to mean that the COE undertook its own conformity analysis. I now understand from your email that the COE did not do so, but instead relied on the MARAD conformity analysis in its 2005 EA. If I am still misunderstanding something in this regard, please let me know.

Thanks again. MF

-----Original Message-----
From: Winn, Ryan H POA [mailto:Ryan.H.Winn@poa02.usace.army.mil]
Sent: Friday, August 31, 2007 12:39 PM
To: Mike Frank
Subject: RE: Port of Anch

Mike,

The U.S. Maritime Administration (MARAD), as the lead federal agency for the project, is required to conform with the requirements of the Clean Air Act.
The MARAD calculated worst case scenario projected CO and PM10 calculations for the port expansion project and determined that de minimis levels would not be exceeded. Attached is MARAD's previous assessments and calculations.
I've also enclosed a revised page C-6 (from Appendix C) which was missing some spreadsheet field values. Since the time of the attached calculations, project modifications have been made to further reduce air quality impacts to the Anchorage CO maintenance area. These modifications include reductions in fill volumes, the use of conveyer belts, and the primary source of fill material being obtained from Elmendorf Air Force Base (EAFB), which eliminates the need to transport fill material through the CO maintenance area (there is a direct conveyer belt and road link between the Port and EAFB). Therefore, the entire project is now primarily outside of the Anchorage CO maintenance area. Additionally, as I understand it, air quality management is integrated into the phased project planning to monitor finalized annual construction activities to ensure that CO and PM10 emissions are de minimis. The actual CO emissions are expected to be quite lower than those originally projected, which is substantiated by the 2006 construction of the backlands (phase I), which was calculated to be 26 tons CO and 32.5 tons PM10.

Please feel free to contact me for additional information. FYI, I'm out until Tuesday.

Ryan Winn
Corps of Engineers

http://www.portofanchorage.org/Library/MTFEA/08-Chapter3.pdf
http://www.portofanchorage.org/Library/MTFEA/AppendixC-AirQuality.pdf

EXHIBIT PP

Phil Brna/R7/FWS/DOI
08/09/2007 04:23 PM

To ryan.h.winn@poa02.usace.army.mil
cc Ann Rappoport/R7/FWS/DOI@FWS, brian.lance@noaa.gov, Mary Nation/R7/FWS/DOI@FWS, jeanne.hanson@noaa.gov, Jon.Kurland@noaa.gov,
bcc Frances Mann/R7/FWS/DOI@FWS
Subject Re: Port of Anchorage Special Condition edits

Ryan, I wanted to add additional thoughts to the email I sent this morning.

In the meetings on August 2 and August 7, we (you, Brian Lance, Jeanne Hanson and me) discussed how the mitigation debits/credits were calculated. Both Brian and I were concerned that the calculations only considered the loss of nearshore/intertidal habitat and that there was no consideration of project effects on movement and migration of juvenile and adult anadromous fish. I said that I wanted to review what the Service said about this issue in the past. The Service has consistently stated (see our letters of March 17, 2006 on the current proposal and June 6, 2005 on phase 1) that we are concerned about both the direct loss of habitat and effects on movement and migration of anadromous fish, and that any compensatory mitigation should include both of these issues. In our March letter, we stated: "We believe the loss of littoral habitat and effects on fish movement and migration will result in significant adverse impacts to aquatic resources of national concern." We further stated that: "The Service believes there should be compensation for all unavoidable losses of intertidal, subtidal and wetland habitats because these habitats are aquatic resources of national importance. Additionally, there should be compensation for unavoidable project effects on movements and migration of anadromous fish."

Based on our recent discussions, it is not clear that compensatory mitigation calculations include anything for project effects on fish movements and migration. Can you provide some insight into how the compensatory mitigation amount was developed? I really do not know if there is any methodology to assess the monetary effect of a project on fish movements and migration. What first comes to mind, is to just assume that project effects on fish movements and migration is at least as significant as the direct habitat loss. (I think a case can be made to support this assumption.) This then leads to the conclusion that compensatory fund amounts should at least be the same- $8+ million for each.

However, rather than put any money into compensatory mitigation it would be preferable to select an alternative which avoids and minimizes effects on anadromous fish to the greatest practicable extent. I think a partially pile supported structure will help to avoid and minimize effects on fish and should be reconsidered.

Phil Brna
Fish and Wildlife Biologist
USFWS, Anchorage Fish and Wildlife Field Office
phone: (907) 271-2440
fax: (907) 271-2786
email: phil_brna@fws.gov
Phil Brna/R7/FWS/DOI

Phil Brna/R7/FWS/DOI
08/09/2007 09:37 AM

To "Winn, Ryan H POA" <Ryan.H.Winn@poa02.usace.army.mil>
cc brian.lance@noaa.gov, Mary Nation/R7/FWS/DOI@FWS, Ann Rappoport/R7/FWS/DOI@FWS
Subject Re: Port of Anchorage Special Condition edits

EXHIBIT QQ

Ryan, I have reviewed the latest version of the special conditions and I have no further suggestions. I especially like the way you modified fish condition 1. As we discussed on August 7, to protect fish, there should be no inwater pile driving or fill placement from mid May until mid August. The LGL Chuitna Coal Report (I provided you) which looked at Knik Arm sites makes it fairly evident that the largest numbers of both juvenile and adult anadromous fish are present during these times. However, we also understand that it is probably not practicable to restrict construction during this time.

I still wish the permitting for this project had been conducted differently. If an objective EIS had been initiated from the beginning, I believe there would have been better information available to assess project impacts and that alternatives which avoid or minimize impacts to fish would have been more objectively evaluated. I also believe that a less damaging practicable alternative would have been found. As you know, I am concerned that the project design which has been selected will have significant effects on anadromous fish and fish habitat and that compensatory mitigation efforts will do little or nothing to replace lost habitat values.

Phil Brna
Fish and Wildlife Biologist
USFWS, Anchorage Fish and Wildlife Field Office
phone: (907) 271-2440
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"Winn, Ryan H POA" <Ryan.H.Winn@poa02.usace.army.mil>

"Winn, Ryan H POA" <Ryan.H.Winn@poa02.usace.army.mil>
08/08/2007 03:43 PM

To <brian.lance@noaa.gov>, <Phil_Brna@fws.gov>
cc
Subject Port of Anchorage Special Condition edits

Special Conditions2.doc

08-18
5-21-07

PORT OF ANCHORAGE

May 21, 2007

Brig. Gen. John W. Peabody
US Army Corps of Engineeers, Pacific Ocean Division
POD HQ
Bldg 525
Fort Shafter, HI 96858-5440

Dear General Peabody,

The purpose of this letter is to bring to your attention a matter of critical importance to the Port of Anchorage and the State of Alaska. After several years of collaborative process, ~~I was surprised to learn that a Record of Decision would not be forthcoming as promised.~~ This is not the first time we have accommodated administrative delay. However this lack of decision will result in postponing physical progress on our Port Expansion project, with severe impact on the economy of Alaska and the security of the United States.

I request that you look into whether the Corps of Engineers is complying with its own policies to avoid abuse of process and unnecessary delay. According to my understanding of the relevant Memorandum of Agreement with the Department of Commerce the Corps, as the decision-maker, has failed to reach a timely decision. ~~Any decision at this point is preferable to no decision.~~

Sincerely,

Governor William J. Sheffield
Port Director

cc: Col. Kevin Wilson, District Engineer, USACE Alaska District

EXHIBIT RR