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U.S. Department of the Interior
Exxon Valdez Oil Spill Trustee Council

Executive Summary Environmental Impact Statement

Proposed IMS Infrastructure Improvement Project

Seward, Alaska

September 1994

Printed Entirely on Recycled Paper

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1.0 PURPOSE AND NEED FOR ACTION

CHAPTER 1.0

PURPOSE AND NEED FOR ACTION

1.1 PROJECT BACKGROUND

The *Exxon Valdez* Oil Spill (EVOS) Trustee Council is proposing to improve the existing research infrastructure at the University of Alaska, Fairbanks (UAF) Institute of Marine Science (IMS) in Seward, Alaska, to enhance the EVOS Trustee Council's capabilities to study and rehabilitate marine mammals, marine birds, and the ecosystem injured by the *Exxon Valdez* oil spill.

The EVOS Trustee Council is comprised of the designees of the Administrator for the National Oceanic and Atmospheric Administration (NOAA), the Secretary of the U.S. Department of Agriculture (USDA), the Secretary of the U.S. Department of the Interior (DOI), the Commissioner of the Alaska Department of Fish and Game (ADF&G), the Commissioner of the Alaska Department of Environmental Conservation (ADEC), and the Alaska Attorney General. The EVOS Trustee Council is responsible for decisions relating to the assessment of injuries, uses of the joint restoration funds, and all restoration activities relating to the proposed project.

Funding for the project would come, in large part, from EVOS funds. Overall, the total project capital budget would be approximately $47.5 million, of which approximately $37.5 million would come from EVOS funds. In 1993, the Alaska Legislature appropriated $12.5 million of state EVOS restitution funds to the City of Seward for the planning, design, and construction of the proposed project. In addition, approximately $25 million of EVOS monies have been requested to fund the research and wildlife rehabilitation component of the proposed project. Lastly, approximately $10 million would be raised from private donors to fund the public education and visitation component of the proposed project. Revenue from public education and visitation would be used to offset the operational costs of the proposed improvements.

The proposed IMS Infrastructure Improvement Project has evolved from an earlier project, generally referred to as the Alaska SeaLife Center, which was originally proposed by the Seward Association for the Advancement of Marine Science (SAAMS). The concepts for the Alaska SeaLife Center emphasized public education and visitation. Preliminary plans called for some 84,500 square feet of interior space and 56,000 feet of exterior space devoted to public education and visitation, wildlife rehabilitation, and research, of which a large proportion of the space was allocated to public education exhibits and related facilities. This facility was conceptually designed around a large permanent exhibit of Steller sea lions, with plans also to accommodate other pinnipeds, sea otters, seabirds, and small cetaceans, as well as fish and marine invertebrates.

The EVOS Trustee Council has received scientific advice that long-term research and monitoring programs will still be required after the last scheduled payment from Exxon is to be received in 2001. As a result, the Council has taken the initial steps to set aside a portion of the current Exxon payments

to fund such future research and monitoring activities. The proposed IMS Infrastructure Improvement Project presented to the EVOS Trustee Council for funding consideration in January 1994 is intended to provide facilities to support many of these long-term research and monitoring requirements.

As a result, this project differs importantly from the original proposals for this site, in that its primary purpose would be to supply laboratory and supporting facilities in which to carry out ecosystem-based research and monitoring activities that would be required to implement the restoration program. Looking to future restoration needs, a Scientific Work Group, comprised of representatives of the State and Federal Trustee Agencies and the University of Alaska, has developed a programmatic conceptual design for research and wildlife rehabilitation to be conducted at this facility. Accordingly, a larger proportion of the space in the conceptual design of the proposed IMS improvements is allocated to research needs than was previously planned, such as wet and dry labs, and office space for marine mammal, marine bird, and fish genetics studies. To accommodate the increased research emphasis of the facility, the space allocated to the public education and visitation component has been proportionately reduced and is not to be funded with joint Federal-State settlement moneys. Reductions also have occurred proportionally to the wildlife rehabilitation and administrative areas.

SAAMS has received authorization from the City of Seward and the Alaska Department of Administration to expend a portion of the 1993 State legislative appropriation to conduct planning and design for the proposed project, now referred to as the IMS Infrastructure Improvement Project or proposed project. The remaining 1993 legislative appropriation would be made available when all capital funding is in place to construct the project.

The EVOS Trustee Council has approved financial support for the proposed project at Seward, Alaska, contingent upon:

1) Ensuring the project complies with the National Environmental Policy Act (NEPA);

2) Consultation with appropriate entities, including the University of Alaska, the City of Seward, SAAMS, and appropriate Trustee Agencies to review the assumptions relating to the proposed improvements, and capital and operating budgets;

3) Development of an integrated funding approach which assures that the use of trust funds are appropriate and legally permissible under the terms of the Memorandum of Agreement and Consent Decree (related to the *Exxon Valdez* oil spill settlement); and

4) Preparation of a recommendation of the appropriate level of funding for consideration by the Trustee Council that would be legally permissible under terms of the Memorandum of Agreement and Consent Decree.

The proposed site in Seward has important aspects that make it suitable for the proposed project:

- Located in the EVOS area;

- Existing marine research program and infrastructure (marine labs, seawater system);
- Suitable land availability (coastal land with room for expansion);
- Availability of high quality seawater for maintaining marine animals;
- Road accessibility to researchers and the public;
- Proximity to research vessel and dock;
- Availability of adequate water, sewer, and electric utilities; and
- Available opportunities for revenue.

The existing IMS Seward Marine Center has been operated by the UAF IMS since 1970. The existing program consists of marine biological and medical research conducted through the UAF research and graduate student training programs. The areas of study include oceanography, marine biology, physiology, and ecology. The existing laboratory has the only running seawater system in the northern Gulf of Alaska region.

1.2 PURPOSE AND NEED

The purpose of the proposed project is to provide the infrastructure for long-term research and monitoring of the ecosystem affected by the *Exxon Valdez* oil spill, with the goal of benefiting the long-term health and restoration of affected resources. The facility is intended to serve as a center for the coordination and integration of on-going and planned comprehensive research and monitoring of the EVOS area as part of an overall restoration plan.

It is expected that the facility's EVOS research program would be integrated with EVOS funded research at other coastal facilities, including the Auke Bay Laboratory and Prince William Sound Science Center. This would occur through the EVOS annual work plan process, collaboration on projects among researchers at the various coastal facilities, and electronic data links.

The *Exxon Valdez* Oil Spill Draft Restoration Plan prepared by the EVOS Trustee Council in November 1993, identifies 11 categories of natural resources that show little or no sign of recovery nearly five years after the *Exxon Valdez* oil spill. These resources include: common murres, harbor seals, harlequin ducks, marbled murrelets, pigeon guillemots, sea otters, intertidal and subtidal ecosystems, pink salmon, sockeye salmon (Kenai River), and Pacific herring. The Draft Restoration Plan includes a restoration strategy for these resources. This strategy has four parts:

- Conduct research to find out why these resources are not recovering;
- Initiate, sustain, or accelerate recovery;
- Monitor recovery; and
- Protect injured resources and their habitats.

This proposed facility and its anticipated research programs attempt to address real and urgent problems with restoring resources injured by the EVOS. These include helping to develop an understanding of factors affecting the recovery of harbor seals, sea otters, sea lions, pink salmon, herring, and murres, among other injured species.

The monitoring and research program is intended to provide important information to help guide restoration activities. A lack of long-term research into ecosystem relationships and problems may result in less effective restoration, injuries lasting longer than they otherwise might, or, possibly, continued injury. Inadequate information may require land and resource managers to unduly restrict human use of the resources, which could compound the injury to services dependent upon natural resources such as commercial fishing and subsistence activities. Inadequate information may also lead to management actions that inadvertently reduce the productivity and health of a resource, inappropriate restoration actions, or restoration opportunities missed for lack of knowledge.

The ecological monitoring and research program is intended to provide information about key relationships in the ecosystem that affect the recovery of injured resources and resulting services. For example, understanding problems with food sources, habitat requirements, and other ecosystem relationships of an injured resource will provide information that promotes both more effective restoration and management of the resource. The research will provide information to help determine why certain species are not recovering, and provide baseline data for early identification of future problems that could also impact restoration of the EVOS injured resources. The research also may provide information about previously unknown spill injuries or change the understanding about known injuries. In many cases, research is needed to achieve restoration or, in the interim, improve management decisions to protect a resource and the services it provides.

Since the mid-1970's, a variety of marine mammals and seabirds that feed in pelagic offshore areas have been declining in the northern Gulf of Alaska and Prince William Sound. These include harbor seals, marbled murrelets, and pigeon guillemots, as well as sea lions and kittiwakes. In contrast, resources using nearshore areas, such as sea otters and sea ducks, appear to have been stable or increasing during the same time period (except for mortality attributed to the EVOS). This has led biologists to think that differences inherent in the food webs of the declining species may be responsible for differing trends. However, the mechanisms of the declines are unknown. In the case of seals, it may be poor juvenile survival. In the case of seabirds, it may be poor survival of chicks.

In order to restore EVOS-injured species, more specific information is needed about the composition of the diet of marine mammals and seabirds; seasonal and annual variability in diet; age-specific differences in diet; and the energetic values of different prey (effects of diet composition on factors such as reproductive success, juvenile or chick survival, and adult condition).

Additionally, there is evidence that exposure to oil from the EVOS caused genetic damage in pink salmon and, possibly, Pacific herring (EVOS Trustee Council, 1994b). Genetic damage may occur not only to the year class that spawned or were exposed during the intense 1989 oiling, but also can be passed down (inherited) to the offspring. The genetic damage may be causing reduced size or affecting reproductive success. While the initial damage is not unexpected, that it may be passed down through generations is an unexpected research finding. This is a critical area of research for pink salmon and Pacific herring.

Genetic research must be conducted under controlled laboratory conditions, preferably with adequate supplies of uncontaminated seawater and freshwater. Currently, fish genetics research related to

restoration of injured resources and services in the EVOS area is hampered by the lack of adequate laboratory facilities in Alaska. The proposed project would address this deficiency by providing the required wet and dry laboratory space, and fish rearing tanks with adequate freshwater and seawater supplies to carry out the needed fish genetics research program.

The Alaska scientific research community is largely field based, and supporting laboratory capabilities are very limited. The majority of laboratory work is sent outside the EVOS area to the lower 48 states. The proposed project is intended to provide research and laboratory facilities in Alaska to study, among other things, fish genetics and marine bird and mammal food requirements, growth, reproduction, and medical problems associated with the recovery of wild populations. Researchers from the University of Alaska, ADF&G, and National Biological Survey (NBS) have expressed an interest in conducting and collaborating with research at the proposed facility. Additionally, researchers from academic institutions outside of Alaska, both nationally and internationally, have expressed an interest in conducting research at the proposed facility.

The proposed facility would also promote the recovery of marine mammal and bird species that were injured by the EVOS through treatment and rehabilitation of such species as they are found in the wild. These species include common murre, harbor seal, harlequin duck, marbled murrelet, pigeon guillimot, and sea otter. Although individual marine mammals and birds specifically injured by the oil spill may not be found by the project's 1997 start-up date, individual animals of these species are regularly found sick, injured, or dead in the EVOS area.

Facilities in Alaska for rehabilitating injured marine mammals are very limited and consist of several veterinary clinics, the Alaska Zoo, and a private center for orphaned seals and sea otters near Homer. Facilities for rehabilitating injured marine birds are also limited and consist of the Bird Treatment and Learning Center in Anchorage, the Raptor Rehabilitation Center in Sitka, and industry supported spill response centers in Anchorage and Homer.

A goal of wildlife rehabilitation services at the proposed facility is to restore the health of individual animals in order that they can be released to the wild. Another goal is to establish and maintain a database on animal health issues based on studies of wildlife at the facility. Wildlife which can no longer survive in the wild, or which present a health risk to wild populations, would be kept at the proposed facility in long-term care for research and public education purposes, transferred to other appropriate facilities, or, as a last resort, euthanized. It is expected that an adequate number of animals for research and display would be available from unreleaseable animals, and animals obtained through transfers from other facilities.

While there is an ongoing scientific debate about the efficiency and cost of wildlife rehabilitation, current spill contingency regulations and agency policies dictate that industry must have the capability to treat and rehabilitate injured wildlife. Most of that capability presently exists in mobile response units. These units, however, cannot provide some critical and long-term care functions for mammals and birds that a fixed facility can provide. The availability of high quality seawater and waste treatment systems, quarantine and intensive care facilities, clinical laboratories, surgical and necropsy facilities, and a highly

trained staff would make the proposed facility useful for spill response and animal rehabilitation in concert with other response capabilities developed by industry.

Because a facility of this type was not available during EVOS, it is plausible that problems concerning early disease detection and potential transmission to wild populations, as well as improving the survival rates of released animals would have been better understood had such a facility existed in 1989. During the EVOS, the unreleaseable otters were sent to facilities outside of Alaska, and the opportunity to study the long-term effects of their exposure to oiling has been diminished.

Alaska waters host one of the largest marine mammal and seabird concentrations in the world. Yet Alaska, with 38 percent of all coastline in the United States, does not have adequate facilities to care for injured or sick marine animals or to study them under controlled conditions. The proposed facility would rectify this.

1.3 THE NEPA PROCESS

The NEPA is a national charter for the protection of the environment. It applies to all federal projects or projects that require federal involvement. The purpose of NEPA is to help public officials make decisions that are based on an objective understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The NEPA is a procedural law which outlines a structured decision-making process for federal agencies. The Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1500-1508) are the primary implementing regulations for NEPA. To ensure compliance with NEPA, a specified process for the proposed project must be followed. The steps in this process are presented below.

1.3.1 Scoping

Scoping is designed to be an open, public activity for identifying the scope of significant environmental issues related to the proposed project. It can be accomplished through written communications, statements at public scoping meetings, and/or formal and informal consultation with agency officials, interested individuals, and groups. If significant environmental issues are identified (significant as defined in the CEQ regulation 40 CFR 1508.27), an Environmental Assessment (EA) is prepared to determine if significant impacts would result from the proposed project. If no significant impacts are identified in the EA, then a Finding of No Significant Impact (FONSI) is prepared. If significant impacts are perceived likely, an Environmental Impact Statement (EIS) is prepared. If significant environmental issues are identified early in the scoping process, or if there exists sufficient public interest/concern, a decision may be made to proceed directly with preparation of an EIS, without first preparing an EA. The scoping process for this proposed project was initiated in March 1994; and public scoping meetings were held in Seward and Anchorage. The results of the scoping process are contained in Section 1.5 of this EIS.

1.3.2 Draft EIS

Sufficient public interest/concern existed to warrant preparation of an EIS for the proposed project, and a *Notice of Intent* to prepare an EIS was published in the Federal Register on March 9, 1994, by the lead federal agency, DOI, on behalf of the EVOS Trustee Council. An EIS is a written document which evaluates all the important environmental and social/economic impacts which may result from the proposed project. It focuses on cause and effect relationships, providing sufficient evidence and analysis for determining the magnitude of impacts and ways to minimize harm to the environment. An EIS should include a full and fair discussion of significant environmental impacts and inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts, or which would enhance the quality of the human environment.

1.3.3 Public Comment and Final EIS

Following publication of the Draft EIS, a public comment period ensued, and public hearings were conducted. Verbal and written comments received were considered and the Draft EIS was revised, as appropriate. All public comments on the Draft EIS are addressed in this Final EIS. Public hearings on the Draft EIS were held on July 26, 1994, in Seward and July 28, 1994, in Anchorage. Written comments were accepted until August 8, 1994, 45 days after the Environmental Protection Agency's (EPA) Notice Of Availability regarding the Draft EIS appeared in the Federal Register.

1.3.4 Record of Decision

Upon publication of the Final EIS, a Recond of Decision (ROD) is prepared. The ROD will include: (1) a statement of what the decision is regarding the proposed project; (2) an identification of alternatives considered in reaching the decision, specifying the alternative(s) considered environmentally preferable; and (3) a statement about whether all practicable means to avoid or minimize environmental harm from the selected alternative have been adopted, and if not, why they were not. The ROD is anticipated in late October 1994, 30 days after issuance of the Final EIS. Following issuance of the ROD, the EVOS Trustee Council will make its final decision regarding commitment of EVOS funds for this proposed project.

As separately discussed in this chapter, the EVOS Trustee Council has proposed to fund only the research and rehabilitation component of this project. The NEPA requires, however, an examination of the environmental impacts associated with the construction and operation of the entire facility, and not merely those impacts associated with federal funding or federal decision-making. As a result, a substantial portion of the analyses in this Draft EIS is directed to the impacts associated with the public education and visitation component of the proposed facility, even though no joint federal-state settlement funds are to be expended for that purpose.

1.4 RESULTS OF THE SCOPING PROCESS

To begin the public notification and scoping process, a *Notice of Intent* was published in the Federal Register on March 9, 1994, that announced the anticipated preparation of an EIS for the proposed project and the opportunity for public input.

Newsletters were mailed to approximately 5,000 people and/or organizations in communities throughout Alaska, and to interested parties in the lower 48 states; public meetings were announced; and written and verbal comments were invited. Public meetings were held on March 22 and 24, 1994 in Seward and Anchorage, respectively. In addition, a scoping meeting for federal and state agency representatives was held on March 29, 1994. Advertisement of the meetings was placed in seven newspapers throughout the state, primarily in those with coverage of potentially affected communities. Public announcements were scheduled on radio stations, and notices were posted in public places.

Nearly 100 people attended scoping meetings in Seward and Anchorage. In addition, over 300 written comments were received during the scoping period. The following summarizes the verbal and written comments received.

A follow-up newsletter was mailed to the public summarizing the information gathered during scoping and identifying the issues and alternatives to be analyzed in the EIS.

An agency scoping meeting was held on March 29, 1994, at the State of Alaska DGC, Southcentral Regional Office, with 16 federal, state, and local government representatives in attendance. The purpose of the meeting was: 1) to review the permits that may be required for the proposed project; and 2) to obtain comments about issues that should be addressed in the EIS. Permitting requirements were addressed and are presented in section 1.4. Topics discussed at the agency meeting included: the potential for hazardous materials to be present at the facility; the tsunami hazard zone; grading and fill 0requirements; potential for the transfer of disease through discharge of animal waste water from the rehabilitation component; erosion potential and soil stability; dredging; effects on the existing UAF IMS dock and the R/V *Alpha Helix*; and effects on camp sites in the proposed project area, the municipal ferry dock, and the ferry access road.

1.4.1 Significant Issues Considered in the EIS

The significant issues analyzed in the EIS resulted from an evaluation of issues raised during the scoping process. These issues include: Geology and Soils; Hydrology and Water Quality; Air Quality; Noise; Wildlife and Aquatic Resources; Vegetation, Wetlands, and Habitat; Visual Quality; Archaeological and Historic Resources; Land Use; Socioeconomics; Utilities and Public Services; Recreation and Tourism; Traffic and Transportation; Public Safety Concerns; and the Cumulative Effects.

1.4.2 Issues Raised That Will Not Be Addressed in the EIS

Several scoping comments were received that questioned the use of EVOS settlement funds for this

proposed project. Some expressed concern that the money was not being used appropriately, i.e. for the proposed project and the preparation of an EIS. Some felt that the funds would be better used for acquisition and restoration of habitat. Others suggested restoration of the lifestyles of villages damaged by the spill.

Although the use of the settlement funds is a significant issue to be addressed with public input, it is not an environmental issue for purposes of this EIS. A programmatic environmental impact statement on the EVOS Trustee Council's Draft Restoration Plan, prepared by the U.S. Forest Service on behalf of the Trustee Council, was published recently. That Draft EIS examines the research and monitoring needs of the overall restoration program. Moreover, through the annual work plan process, the EVOS Trustee Council seeks and obtains public comment on the appropriateness of the funding for this, and other projects, as part of the overall restoration program. Comments received regarding the issue of project funding have been directed to the EVOS Trustee Council for consideration. A Draft Fiscal Year 1995 Work Plan currently is available for public review and comment.

1.4.3 Alternatives Suggested But Not Selected For Inclusion in the EIS

Some comments received suggested that the EIS examine alternative sites for all, or part, of the proposed project. One specific suggestion was to locate the marine bird facility in Homer where the FWS has proposed a visitor facility featuring displays of marine birds.

Alternative site locations for the proposed facility are not analyzed in this EIS. In January 1994, the State of Alaska put forward a proposal to the EVOS Trustee Council for a research and wildlife rehabilitation facility in Seward, Alaska. In addition, the 1993 Alaska Legislature had appropriated $12.5 million for partial funding for the planning, design, and construction of this facility in Seward. At its January meeting, the EVOS Trustee Council approved this additional financial support for the proposed facility in Seward contingent on completing several tasks, one of which is NEPA compliance. Thus, the intent of the State of Alaska in proposing the facility and appropriating partial funding for it, and the EVOS Trustee Council in tentatively approving additional funding for it, clearly is that the facility would be located in Seward and that the environmental effects of constructing and operating the facility in Seward were to be examined in NEPA documentation. Accordingly, alternative locations for this proposed facility are not examined in this EIS.

An alternative design for the proposed project was received that suggested using UAF-owned land (Block 5A) to accommodate visitor parking needs related to the proposed project. The alternative design is intended to create an IMS Seward Marine Center "campus" and to allow Tracts 5 and 6, proposed in Alternative I for visitor parking, to remain park land.

As more fully described in Section 5.2, a conceptual design was analyzed to determine if parking requirements of the proposed project could be met on the existing IMS Rae Building site, Block 5A. Title 15 of the City of Seward Planning and Land Use Regulations require that parking for facilities, such as the proposed project, be designed to meet peak parking demand. With the square footage available on the Block 5A site, the peak parking demand of the proposed project could not be met.

Additionally, correspondence from Mr. Tom Smith, Assistant Director for Coastal and Marine Operations for the UAF IMS Seward Marine Center, offers his opinion that "the University would not support a request to utilize the remainder of its property to provide visitor parking for the proposed facility" (see Appendix A for correspondence). This opinion is based on the long-range master plan for the IMS Seward Marine Center, which includes potential expansion of existing IMS facilities. Although the University is supportive of locating the proposed staff parking lot on Block 5A, there is an important difference between changing its long-range plan to accommodate an incremental (50-space) expansion of an existing parking lot versus changing the plan to accommodate 216 parking spaces. The latter would foreclose, as a practical consideration, future opportunities to expand university facilities on Block 5A.

In consideration of the above, this alternative design for the proposed project is not examined further in this EIS.

1.5 KEY DIFFERENCES BETWEEN THE DRAFT EIS AND THE FINAL EIS

The following summarizes key changes that have occurred since publication of the Draft EIS. These changes are reflected in this Final EIS. None of the changes result in substantial alteration of the effects previously identified in the Draft EIS.

- As adopted by the City Council, Resolution 90-095 identifies Tracts 2 through 6 as a future construction site for the proposed project. Although the Draft EIS discusses the options of a land transfer versus a lease arrangement with the city, information available at that time indicated that a land transfer would be most likely. Discussions between the City of Seward and SAAMS have progressed; it now appears more appropriate for the Final EIS to focus on a lease agreement rather than a land transfer. Analysis of potential effects in the Final EIS is based on the most current information regarding a potential lease arrangement.

- Recent P&Z Commission action on the CUP, Variance, Rezone, and Replat has occurred that affects the Land Use and Local Approvals sections of the Draft EIS. To date, a height variance has been issued by the City Clerk's office, and a resolution was adopted authorizing issuance of a CUP to SAAMS for the proposed project with 16 stated conditions. An appeal by SAAMS of two conditions will be addressed by the Board of Adjustment of the City Council. These actions and the potential effects are addressed in the Final EIS.

- Recent City Council action has introduced an ordinance for public hearing to change the Land Use Plan and Zoning for all of the proposed project site to CBD. The text of the Final EIS reflects this information.

- With the information provided to EIS analysts at the time of the Draft EIS, evaluation of effects assumed a greater likelihood of ferry service relocation from the Municipal Dock on the project site than of it remaining at its current location. The approach in the Final EIS is to equally evaluate the two scenarios rather than assume one or the other. Additional correspondence is included that reflects the current status of discussions between the City of Seward and the ADOT/PF Alaska Marine Highway System regarding ferry service in Seward.

- As lease negotiations have progressed between the City of Seward and SAAMS, preliminary agreements have been made regarding SAAMS' involvement in the lease termination and relocation of Northern Stevedoring Handling Corporation (NSHC), and the relocation of the Teen/Youth Center activities. The Final EIS mentions the commitment by SAAMS to assist the city in those endeavors.

- SAAMS has agreed, as part of the lease negotiations with the city, to pay sales tax to the city and borough on ticket and sales revenue. This economic effect to city revenues has

been analyzed in the Final EIS.

- A spring located on Lowell Point Road has been added as a potential source of freshwater for fish genetics studies.

- The purchase of a submersible and support vessel may or may not occur as part of the proposed project. Nonetheless, for NEPA purposes, purchase of these vessels still is assumed as part of the proposed project for the Final EIS.

- The infrastructure for the tide pool would be completed during the construction of the proposed project. The Draft EIS indicates that operation of the tide pool would be part of this phase; however, further design work has determined that its operation would occur at a future phase of the project. Only the tide pool infrastructure is incorporated into the project design at this time.

- A reference to a recent verification of visitor assumptions and revenue projections was added to the Final EIS (Fox, 1994). A summary of that verification is included as an appendix to the Final EIS.

- The final location of the site(s) to be used as a material source would not be chosen until an engineering assessment has been made. Four additional potential material source sites were discussed in the Final EIS rather than the Lowell Point Road option only.

- Archaeological and Historic Resource and Visual/Aesthetics sections were revised throughout the Final EIS to reflect recent consultations with the SHPO to address NHPA Section 106 requirements. Additionally, an archaeological survey and historic resource inventory have been included as Appendix B of the Final EIS.

- Comments received on the Draft EIS are included in Chapter 5.0 of the Final EIS. Responses to comments also appear in Chapter 5.0; and text of the document has been revised, as appropriate.

- An alternative project design proposed during the public comment period after the Draft EIS prompted an evaluation of its reasonableness for inclusion as an alternative to be fully examined in the Final EIS. The Final EIS addresses the proposed alternative both in Section 1.5 and Chapter 5.0.

CHAPTER 2.0

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This section includes a description and comparison of the alternatives analyzed in this EIS. It also includes a discussion of mitigating measures, both measures that are considered part of the proposed project and potential measures, and an evaluation of effectiveness.

Two action alternatives have been analyzed in this EIS. Both action alternatives are proposed to be constructed adjacent to the existing campus of the IMS Seward Marine Center on city-owned land made available by lease to SAAMS for the project. The Seward Marine Center has been operated by the UAF IMS since 1970. The existing program consists of marine biological and medical research conducted through the UAF research and graduate student training programs. The areas of study include oceanography, marine biology, fish and invertebrate physiology, and ecology. The existing laboratory has the only continuously running seawater system in the northern Gulf of Alaska region.

Alternative I, The Proposed Action, would have both a research and wildlife rehabilitation component and a public education and visitation component. Alternative II would be a reduced project with a research and wildlife rehabilitation component only; the public education and visitation facilities, including the parking lot and plaza adjacent to the building, would not be part of this Alternative.

A No Action Alternative also is evaluated in the EIS as required under the NEPA and its implementing regulations (40 CFR 1500-1508). This alternative would mean that the improvements proposed as part of this project would not be made to the infrastructure of the IMS Seward Marine Center. The following sections present a detailed discussion of the project alternatives.

2.2 ALTERNATIVE I - THE PROPOSED ACTION

The proposed project would be constructed adjacent to the existing IMS facility in Seward, Alaska, on the shore of Resurrection Bay. The proposed action would have two components: (1) a research and wildlife rehabilitation component; and (2) a public education and visitation component.

2.2.1 Proposed Site

The proposed project site is an industrial waterfront property with a mix of industrial and historic structures on the shore of Resurrection Bay. The proposed project site is currently owned by the City of Seward and occupied by the Northern Stevedoring Warehouse and welding shop, the Youth/Teen Center, the Municipal Dock, and a portion of Waterfront Park. The dock serves the Alaska Marine Highway System as the landing for the ferry M/V *Tustumena*, as well as other commercial marine interests. The land to be leased by SAAMS includes Tracts 2, 3, 4, 5, and 6; the Municipal Dock; the

ferry access road; and a portion of the city tidelands to construct the tide pool infrastructure, wave barrier, and building face. An easement from the city would be required for the seawater intake and outfall structures since they would extend beyond the leased area. Negotiations are underway between the city and SAAMS on conditions of the lease.

Tract 2 of the proposed site is currently zoned Central Business District (CBD). Tracts 3 and 4, the Municipal Dock and its access road, are zoned Industrial (I), and Tracts 5 and 6 are zoned Park (P). A request by SAAMS was submitted to the city to amend its Land Use Plan and to rezone these tracts to CBD. Ordinance No. 95-35 was introduced by the City Council on August 22, 1994 to grant the request by SAAMS to rezone Tracts 3, 4, 5, and 6 to CBD. A public hearing was set for September 12, 1994, and, if action is taken by the Council at that time, the rezone will become effective on September 22, 1994.

SAAMS also applied for a Conditional Use Permit (CUP) to develop a marine research and public education facility on Tracts 2 through 6 of the Seward Waterfront Tracts. The P&Z approved the CUP subject to 16 conditions, two of which are being appealed by SAAMS (see Section 3.9 for more details).

The following is a brief discussion of existing activities and structures on the proposed site.

Municipal Dock: The Municipal Dock is located in Tract 2 at the foot of Fourth Avenue. Relocation of state ferry service has been under consideration by the city and the Alaska Marine Highway System for some time. Due to the east to west orientation of the dock, vessels are particularly susceptible to damage from the prevailing south to north wave movement in Resurrection Bay. Additionally, a Shore Condition Survey done by the Alaska Department of Transportation and Public Facilities (ADOT/PF) for Seward's city bulkhead indicates that major structural defects cause concern for the useful life span of the dock (see Appendix A for letter from the Alaska Marine Highway System).

It is the city's intent to relocate the state ferry service from the city-owned dock at the proposed project site to an alternate site in Seward that meets the needs of the Alaska Marine Highway System (a letter of intent from the city is included in Appendix A of this document). The existing arrangement between the city and the Alaska Marine Highway System, which provides preferential berthing to the M/V *Tustumena*, will expire in 1996. At this time, discussions are in progress to determine the most feasible location for an alternate site.

Relocation of the state ferry service may occur at any time; however, the potential exists that an acceptable alternate site in Seward would not be found before construction of the proposed facility begins, or even before the opening of the new facility in the spring of 1997. If an alternate site location is not resolved before the spring of 1995, construction plans would include the safe routing of ferry traffic to the dock through the proposed visitor parking lot area until the summer of 1996 when final site work occurs. Should the relocation not be resolved before opening, the ferry could continue to dock at its present location and ferry traffic would be routed through the facility's visitor parking lot. This would require coordination with the Alaska Marine Highway System office with respect to the ferry berthing schedule, and strict monitoring of the parking lot and Railway Avenue to control the entering, exiting,

and queuing of ferry traffic. Control and maintenance of the Municipal Dock would remain with the city as long as ferry service stays at that location. All lease revenues from the Alaska Marine Highway System to the city for use of the dock would continue as well.

Youth/Teen Center: The building housing the Youth/Teen Center is located on Tract 2 of the proposed project site at the southwest corner of Fourth Avenue and Railway Avenue. City officials and residents have long considered this a less than appropriate location for the center, and relocation options are being investigated. SAAMS is currently working with city officials to financially assist in the relocation of the center as part of this project. The building would be removed from the site, when necessary, to complete the proposed project.

Northern Stevedoring Warehouse and the Welding Shop: Northern Stevedoring Handling Corporation (NSHC) currently leases the property in Tract 4 from the city; a lease that is to expire in 1999. SAAMS has agreed to purchase the existing lease and buildings from NSHC as part of this project. The contents of the warehouse have been sold to a private company and will be removed before construction begins. Prior to construction of the proposed facility, the welding shop would be removed from the site. The warehouse could be retained during construction as a staging facility and removed when necessary, to complete the proposed project.

Waterfront Park: This recreational area begins on Tracts 5 and 6 of the proposed project site and extends east and north of the proposed project site along the Resurrection Bay Shoreline for a distance of approximately 1.5 miles. Waterfront Park is a multi-use area, incorporating four RV campgrounds (Resurrection North and South, Marathon, and Iditarod), a tent camping area, and day-use areas such as the Adams Street Pavilion. A bike path runs the entire shoreward length of the park, linking the Small Boat Harbor to the north with the Municipal Dock south of Waterfront Park. A portion of the Iditarod Campground (57 camp sites) would be removed as a result of the proposed project.

2.2.2 Adjacent Sites

The Alaska Railroad Depot: The existing Alaska Railroad Depot, which is on the National Register of Historic Places (NRHP), currently serves as the ticket office and operations building for the Alaska Marine Highway System. The depot is adjacent to the proposed project site to the north of Tract 5. The proposed project design would be visually compatible with the historic nature of the facility and landscaping would serve as a buffer between the two facilities. Consultation with the SHPO is underway, and a MOA is being developed to ensure protection of historic resources, such as the Railroad Depot (see Appendix A for correspondence between DOI and the SHPO).

Ladies Park: The existing Ladies Park is the remaining segment of an older city park known as Niles Park or Hoben's Park. It occupies a small parcel of land west of the Alaska Railroad Depot. It is primarily an open green space, with a small concrete pad for basketball. As with the Alaska Railroad Depot, no proposed project activities would occur on park land; however, SAAMS is currently woking with the city's Historic Preservation Commission to protect and/or improve the character of this site. The park has a city historic designation, but is not on state or federal registers.

Iditarod Trail: At the southern edge of the Ladies Park is a paved walk and commemorative display which marks the location of the beginning of the original Iditarod Trail, which is on the National Register of Historic Trails. The original trail was established in the early 1900's to provide a transportation route for dog sleds to the gold rush community of Iditarod. It currently serves as a walkway and bike path that terminates at the west side of Ladies Park.

IMS Seward Marine Center: The existing IMS Seward Marine Center consists of facilities located on Tract 1 and on Block 5A, across Railway Avenue to the north. The four buildings on Tract 1 are: the D.W. Hood Physiology and Medical Research Building; a machine shop building; the Marine Biology Lab; and a larger building holding the library, offices, and warehouse. An aquaculture pond, outdoor seawater tanks, dock, and life support system with intake and outfall structures also are located on Tract 1. The UAF medical program uses the Seward facility to conduct their joint UAF-Russia medical research projects. Additionally, the Seward Area Native Association is actively involved in shellfish aquaculture at the laboratory, and the site is under consideration for the location of a State of Alaska Mariculture Technical Center and Shellfish Hatchery.

An educational program is operated from the K.M. Rae Building in Block 5A. This public service program disseminates the results of marine science research to the public, science educators, policy makers, and researchers from other institutions. A large gravel parking lot and four-plex apartment unit to accommodate visiting faculty and students are adjacent to the Rae Building.

The 133-foot research vessel R/V *Alpha Helix* is operated by UAF for the National Science Foundation and uses the IMS Seward Marine Center dock on Tract 1 as its home port.

2.2.3 Proposed Improvements

The proposed improvements to the IMS Seward Marine Center would provide a facility for the rehabilitation and study of marine mammals and birds, particularly pinnipeds (harbor seal and Steller sea lion), sea otters, and alcids (common murre, pigeon guillemont, marbled murrelet, and tufted and horned puffin). Proposed improvements would include: tanks and pens (temporary holding, long-term habitat, and quarantine); a life support system (running seawater and disinfection); a freshwater system; pathology and water quality laboratories; and x-ray, surgery, pharmacy, and necropsy facilities.

Research and Wildlife Rehabilitation Component: The research and wildlife rehabilitation component would consist of approximately 22,000 square feet of interior space made up of wet and dry laboratories, staff offices, and a 1,500 square foot library for the study and rehabilitation of marine mammals, marine birds, and other marine life. An additional 27,000 square feet of building support area would be shared with the public education and visitation component of the facility. There would be approximately 46,000 square feet of exterior space containing an outdoor research habitat with tanks and pools for pinnipeds, sea otters, and marine bird species. A 50-space parking lot for staff vehicles would be constructed adjacent to the existing IMS Rae Building parking lot. This lot, approximately 37,000 square feet, would be paved, striped, and lighted; and a stormwater drainage system would be installed to accommodate

additional runoff from the proposed staff lot and the upgraded Rae Building parking lot. The proposed system would connect with the city's stormwater line in Third Avenue.

The proposed project would provide extended research facilities for current and future efforts of the UAF IMS faculty and scientists in an integrated program emphasizing animal health research. In order to allow for possible future growth, the new structures would be constructed on property directly adjacent to the existing IMS Seward Marine Center, which occupies land currently leased from the city. Future development by SAAMS or UAF could occur between the two facilities to further enhance this integrated program.

A variety of sheltered outdoor tanks and pools would be provided for marine mammal and bird research that would cover approximately 30,000 square feet of the site. The tanks would consist of permanent and portable "ring"-tanks varying from 35 feet to 51 feet in diameter, and an oval 40 foot by 60 foot tank. Tank depths would vary between and 5 and 15 feet deep. These tanks have been designed to exceed minimum standards for marine mammal and bird haul out and water depths. The habitat would provide areas for marine mammals and birds to exercise and would be an appropriate rehabilitation space for the transition of recovering marine birds and mammals. A flight area is unnecessary, since seabirds develop wing strength through underwater swimming.

This research habitat would provide for the long-term care of those marine mammals and birds involved in specific research programs. It would, to the extent possible, duplicate the natural environment for proper husbandry and behavioral studies. The habitat would consist of wet pools, dry haulout areas, and resting areas to accommodate up to four sea otters, 125 seabirds, 6 to 12 harbor seals, and 2 to 4 Steller sea lions. The marine bird habitat would allow for perching, nesting, and swimming as in the natural environment. The habitat would include separate areas for the different species groups and specific individual animals.

A Life Support System (LSS) would supply seawater similar to natural conditions of Resurrection Bay for the live tanks, live pools, wet laboratories, and the research habitat. The system would be sized to circulate up to 5,000 gallons per minute (gpm) from Resurrection Bay. The LSS would be a partially closed system using a low pressure sand filtration process and ozonation for disinfection and water quality enhancement as required. The LSS includes: pumps; piping; valves and pipelines for intake, discharge and circulation; and filtration, ozone generation, and emergency circulation systems. A more detailed discussion of the LSS is provided in Section 2.2.5.

Approximately 150 gpm of freshwater would be needed for fish genetics studies. This is intended to be supplied by a spring located approximately 2,500 feet from the project site on Lowell Point Road. Preliminary analysis of this water source indicates that water quality parameters are within acceptable ranges for salmonid cultures (see correspondence from ADF&G in Appendix A). Further testing is being conducted, however, and if water quantity and/or quality is not acceptable, other potential sources include a well or wells drilled on the IMS Seward Marine Center campus near the Rae Building (see "letter of agreement" in Appendix A), surface water (Lowell Creek), or water supplied from the city. A gravity fed storage tank would be required.

Anticipated laboratory equipment would include: lab benches and cabinetry; office furnishings; shelving and office equipment; sinks, gases, and seawater service; and fixed and loose equipment such as balances, scales, centrifuges, metering and analyzing devices, fume hoods, hydro-acoustic systems, video equipment, computers and printers, a modem, microscopes, autoclaves, freezers, transport cages, hoists, dollies, tanks, and oceanographic equipment.

Anticipated long-term research and monitoring in the EVOS region might identify the need for a dedicated research vessel and submersible to help carry out an integrated research program that includes oceanographic sampling, fish trawling, hydroacoustics, population surveys, and basing for scientific crews. Additionally, there are anticipated research projects that would involve the use of a submersible and tender such as:

- Assessing physical and biological factors that affect productivity, recruitment, growth, and survival of species that are linked by food webs to injured resources in the pelagic and nearshore environments;

- Investigating linkages between pelagic and benthic food webs in the EVOS area;

- Supporting field studies assessing basic biological processes including mating, rearing, molting, predation, and species' interactions;

- Conducting studies of fish and invertebrates in ecologically sensitive benthic and nearshore habitats, and in protected areas to assess spill impacts and other human-induced factors which might be affecting the recovery of injured species;

- Assessing abundance and distribution of benthic resources in high relief, nearshore environments which are difficult to sample with conventional gear; and

- Investigating human-induced factors affecting key species and benthic habitats including impacts from fish and shellfish harvesting (trawling, longlines, scallop dredging), and processing (disposal of fish wastes).

EVOS research and monitoring is currently being conducted from a suite of platforms, including private and government vessels. The nearest available submersible is located in California and must be ferried to and from Alaska. The availability and cost of these vessels may not meet long-term research needs for the EVOS area. Achieving the goal of a fully integrated research program may be more difficult and costly if numerous and less-than-optimum research platforms were to be used.

This EIS analyzes the potential impacts of basing a research vessel and submersible in Seward. A decision on whether an EVOS dedicated research vessel and submersible would be purchased, leased, or chartered would reflect the specific requirements of the long-term research mission and the cost effectiveness of the various options. Such a decision would be made by the EVOS Trustee Council as part of its budget review process.

Should a vessel be part of this project, it would use the existing IMS Seward Marine Center dock for loading and unloading the submersible, equipment, and supplies, and would moor at the dock when the R/V *Alpha Helix* is at sea. The R/V *Alpha Helix* is at sea for approximately 180 days per year, nearly continuously from May through October. The research vessel would also be at sea and would use the IMS Seward Marine Center dock for the majority of time during April through November. Therefore, the need for transient moorage in the Small Boat Harbor during times of peak crowding would be minimal. During infrequent periods in summer when both vessels are in port, the research vessel could use the Small Boat Harbor with prior permission of the Seward Harbormaster, anchor outside the Small Boat Harbor in Resurrection Bay, or use other transient moorage such as the Seward Marine Industrial Center (SMIC) dock. Coordination of vessel schedules and moorage arrangements with the IMS Seward Marine Center and the Seward Harbormaster would occur to minimize potential impacts on available moorage space.

The rehabilitation element of this component would have trained staff and resources to respond to routine incidents involving sick, injured, or deceased marine mammals and marine birds in the northern Gulf of Alaska. Examination of such injured marine mammals and birds could provide important data on the status of these species and their habitats. Rehabilitation activities at the proposed facility would aid in the recovery of marine mammal and bird populations that were injured as a result of the *Exxon Valdez* oil spill. Studies would be conducted on animals brought to the facility to determine diseases or injuries that may be affecting the recovery of wild populations. A repository of tissue and blood specimens would be maintained from all animals handled by the facility. Dead birds and mammals would be necropsied to determine, to the extent possible, the cause of mortality.

The goal of wildlife rehabilitation services at the proposed facility is to restore the health of such wildlife in order that they can be released back to the environment. In coordination with the other response facilities in the Prince William Sound area, the proposed facility would provide long-term and critical care functions not currently available in the EVOS area. Wildlife which cannot survive in the wild, or which present a health risk to wild populations, would be kept at the proposed facility in long-term care for research and public education purposes, transferred to other appropriate facilities, or, as a last resort, euthanized.

Public Education and Visitation Component: The public education and visitation component would require the construction of approximately 26,000 additional square feet of interior space allocated to a 200 seat auditorium, exhibits, circulation areas, public restrooms; and a retail outlet for the sale of educational materials. This component would share with the research and rehabilitation component approximately 27,000 square feet of building support area, consisting of the space for the LSS, mechanical, administration, maintenance, and curatorial functions. The public education and visitation component would also include a 90,000 square foot, 166-space paved parking lot adjacent to this component and 67,000 square feet of walkways, landscaping, and an outdoor public plaza. The tanks and pools of the research component would be provided with a visitor walkway for viewing the outdoor habitats of marine mammals and birds.

The public education and visitation component of the proposed project would function in concert with, and in support of, the research component. It would be funded through private donations; no EVOS joint restoration funds would be involved in its construction or maintenance. These funds, approximately $10 million, are to be raised from private sources by SAAMS. The public education and visitation component would, via admission fees, parking fees, and sales of educational materials, provide financial support for the operations of the facility.

The mission of the public education and visitation component is to offer the message of environmental responsibility of Alaska's marine resources through educational programs. Visitors to the center would observe interpretive displays of a cross-section of Alaska's marine habitats. They would have the opportunity to meet members of the science and research staff, and gain exposure to an array of scientific investigations. The proposed facility would complement marine programs in educational institutions across the state.

2.2.4 Construction Program

Site work for the proposed project would include: grading, excavation, removal of shoreline debris, city sewer main relocation, city storm water diversion, and electrical line relocation. The proposed facility construction efforts would include: foundation, substructure, wet well, roofing, interior finishes and habitat, and installation of circulation, mechanical, and electrical systems. Excavation for the wet well would occur to depths of -13 feet; street level is at +22 feet, resulting in a maximum 35 foot depth. The foundation of the building footprint, however, would require excavation of materials to a depth of +11 feet, an excavation of only 11 feet.

In order to comply with the General Permit for Stormwater Discharges under the NPDES, a Stormwater Pollution Prevention Plan would be written and implemented. It would include a description of measures that would be installed to control pollutants in stormwater during construction. The purpose of such a plan is to identify potential sources of stormwater pollution and to describe practices which would be utilized to prevent releases of pollutants into stormwater discharges which, in turn, end up as pollutants (including sediment) in Resurrection Bay. The plan would emphasize implementation of best construction management practices. Many construction activities contribute to erosion and sedimentation. The techniques for minimizing erosion and sedimentation rely on a few simple principles, including shielding soil from rainfall and runoff, reducing soil exposure time, controlling runoff water, slowing runoff velocity, and trapping sediment. Best management practices involving these principles would be specified for construction of the proposed project and would include the following (more specific measures would be determined via the stormwater planning process):

- Stabilization Controls - Temporary seeding, permanent seeding, mulching, surface covering, and stabilization matting.

- Structural Controls - Sediment traps, sediment basins, silt fences, earth dikes, subsurface drains, interceptor trenches or barriers, temporary berms, slope drains, straw bale barriers, and velocity dissipation devices.

Grading, Excavation, and Fill Activities: Based on conceptual site layouts, approximately 10,000 cubic yards of material would be excavated from beneath the building substructure to achieve design sub-grade elevations. Roughly 7,000 cubic yards of this structural fill if suitable, or fill from nearby sources, would be required beneath the second story foundations and adjacent to the structure. The remaining 3,000 cubic yards of excavated fill would be used for other site development, such as leveling the plaza, sidewalk, and parking areas. Peratrovich, Nottingham, & Drage, Inc. (PN&D) conducted a preliminary geotechnical study of the proposed site in 1993, which found the material at the site suitable for use as structural fill. As stated in the geotechnical report, there may be buried debris requiring removal during construction, but nothing was discovered suggesting that the native material would be unsuitable for use as structural fill. Should additional fill be required, sources of alluvial deposited fill material conforming to the ADOT/PF specifications are located within approximately three miles of the proposed building site.

Shoreline activity would include excavation and backfill from elevation contour 13.8 seaward.

A 60-foot by 160-foot man-made tidal pool is planned adjacent to the facility along the shoreline. Adequately sized armor rock is available from local quarries to place around the tide pool and along the shoreline for stabilization and wave protection purposes. Offshore dredging is not anticipated for this project; only minor reshaping of the shoreline near the man-made tidal pool would be required. Shoreline activity is anticipated to clear the area of minor debris resulting from the 1964 earthquake and tsunami. Excavation of approximately 200 cubic yards of material would also be necessary for intake line placement.

To further protect the shoreline from erosion, a sheet pile bulkhead wave barrier would be constructed behind the tide pool. The wave barrier would be located adjacent to the shoreline and designed to protect against erosion from significant storm wave action. The required length of the barrier would extend from the existing armor rock wave barrier fronting the IMS property to the existing Municipal Dock, approximately 160 linear feet. The wave barrier would have a low profile, with armor rock in front to minimize the visual impact and to provide habitat for marine organisms. Approximately 5,000 cubic yards of armor rock would be placed in this area for both shore stabilization and landscaping.

Table 2-1 provides a summary of the estimated excavation and fill requirements for the proposed project.

TABLE 2-1
ESTIMATED EXCAVATION OR FILL QUANTITIES

Material for Site Development	Quantity
Armor Rock	5,000 cubic yards
Excavation	10,000 cubic yards
Structural Fill	7,000 cubic yards
Other Site Development Fill	3,000 cubic yards
Sheet Pile Bulkhead Wave Barrier	160 linear feet
Wave Barrier	**Quantity**
Total Riprap Fill from Elevation Contour 9.6 Seaward	2,740 cubic yards
Total Riprap Fill between Elevation Contours 9.6 and 13.8	1,500 cubic yards
Total Excavation Between Elevation Contours 9.6 and 13.8	500 cubic yards
Excavation for Building Foundation and Wet Well	**Quantity**
Total Excavation from Contour Elevation 9.6 Seaward	1,200 cubic yards
Intake Pipe Excavation	**Quantity**
Total Excavation from Elevation Contour 9.6 Seaward	200 cubic yards
Areal/Extent of Fill	0.8 Acres or 35,000 Square Feet

Source: PN&D, 1994.

Tide Pool: As previously described, a tide pool is planned to be constructed for wave protection. The shore side structure of the tide pool would be included in the initial construction as it is formed by the construction of the protection required for the building. It would be formed of sheet pile cells and armor rock. The two- to three- foot sheet pile edge would have a continuous "basket" welded to it, which would be filled with rocks. This rocky edge would provide habitat for marine fauna and flora, as well as protection for certain nearshore species, including salmon smolts.

The bay side structure of the tide pool would be formed in much the same way at a later phase of the project. The addition of marine invertebrates and plants would complete the tide pool. The tide pool, when completed, would be supplied with a portion of the treated seawater being discharged from facility tanks and pools. The amount of discharge would depend on the species living in the tide pool and the

final design. As an added benefit, the tide pool would provide an educational and research opportunity for the study and observation of marine life occurring in the region.

Potential Material Sources

There are five potential sites for armor rock in the Seward vicinity. Site one is a Kenai Borough-owned quarry located in the far north west quadrant of the city. The site consists of about 80 acres adjacent to the borough-owned and operated landfill transfer site. It was an active rock source in the mid 1980s for a retaining wall in the river. The site is adjacent to the city limits and no city land use controls apply. No residential or commercial uses are within a fourth of a mile of this area. Access to the new extraction area would be through the borough transfer site. Diamond Boulevard is the primary access and connects the area to the Seward Highway through Forest Acres Subdivision. Land use in the immediate area is predominantly light industrial and vacant.

Site two is on privately-held land (Afognak Logging Incorporated). The area is near Japanese Creek, slightly to the south and closer to the developed areas of the city. This is the only site within the city limits. The parcel is about 80 acres and is currently undeveloped. An area to the east is platted into residential lots as the Forest Acres Subdivision. Much of this subdivision is not developed on the west side. The nearest residences (two) are at the corner of Maple and Ash streets. Access to the extraction site would be by Ash Street off of Diamond Boulevard.

The third site is a city-owned pit located on Lowell Canyon Road, west of the proposed project site. It is currently being used as a source of construction material. The fourth site is a state-owned quarry to the south of the city on Lowell Point Road. This site is an inactive state material site occasionally used for maintenance of the Lowell Point Road. It was originally established during the construction of the Seward Small Boat Harbor in the mid-1960s. The site is outside of the Seward city limits and the land use is administered by the DNR. The site is approximately three acres in size.

The fifth potential site is a city-owned quarry just east of the SMIC on the east side of Resurrection Bay. It consists of material left over from site preparation and stockpiled by the city, which has priority use of the material stockpiled there.

Exterior Building Description: The exterior building construction would be concrete and masonry, on the lower level (street level), and would transition to wood or steel construction on the upper level. The exterior finishes (wood, masonry, or metal) of the facility would be visually compatible with the downtown area with regard to exterior forms, materials, and colors of surrounding buildings in the downtown area and on the adjacent IMS site.

The roof would consist of an architectural grade metal roof system of various heights. The average building height would be approximately four feet above the 34-foot-above-grade limitation, as required by city ordinance. The City of Seward P&Z Commission issued a Variance Permit on August 8, 1994 that allows this exceedance of maximum building height limits.

Parking and Traffic: Visitors to the educational component of the proposed facility would arrive in Seward by four primary modes of transportation: cruise ships, the Alaska Railroad, tour-buses, and private car or recreational vehicle (RV). Those visitors arriving by rail or cruise ship would disembark near the Small Boat Harbor or Railroad Dock, and then proceed to the proposed facility by charter bus or other informal transportation modes, which could include walking, taxi, or the local trolley.

Parking would be provided for the peak number of private cars and RVs expected to bring visitors to the proposed facility at one time, estimated to be 216 vehicles -- 50 for staff and 166 for visitor vehicles, including 15 to 20 RVs. This would be accomplished by construction of a paved, 166 space lot to the east of the proposed facility for visitor parking and a paved, 50 space lot constructed north of the existing Rae Building parking lot for employees. An agreement with the UAF IMS for construction of the employee lot would include improvement of the existing IMS parking lot with asphalt paving, striping, lighting, and improved access to Third Avenue, and a stormwater drainage system (letter of agreement in Appendix A). Access to the proposed staff lot would be from Washington Avenue. Bike racks would be provided at both parking lot locations to encourage this alternative mode of transportation.

A passenger drop-off area for eight to nine buses would be provided by a "cut-out" on the south side of Railway Avenue between Third and Fourth Avenues. This would accommodate visitors arriving in Seward by cruise ships, chartered or private boats at the Small Boat Harbor, by rail at the railroad dock, chartered bus services, school groups, and existing or potential shuttle bus service.

After dropping off passengers, buses would circulate back to existing layover locations in other areas of Seward, via Fourth or Fifth Avenues. The bus loading zone would be a pullout type of space, which would eliminate the potential for encroaching on the eastbound through travel lane. A maximum of 18 buses could arrive and depart during the peak hour of a high visitor day, which equates to an average of one bus movement every 3 minutes in the peak hour. It is recognized that bus activity may occur in surges from a cruise ship, which would result in short periods of higher intensity, followed by extended periods with little or no bus activity.

Visitor parking access is planned via two driveways on Railway Avenue, one at the eastern periphery of the site and the other approximately 200 feet to the west, between Fifth and Sixth Avenues.

The bicycle/pedestrian path that extends from the east through Ladies Park would continue to the west side of the project site, passing in front of the proposed IMS building. It would cross the driveways parallel to Railway Avenue; driveway crossings would be protected by bollards and other demarcation to alert trail users.

If the Municipal dock is not relocated prior to facility startup, there is a potential that the parking lot would have to be shared with ferry traffic. This could be accommodated by separating facility and ferry vehicle usage of the parking lot. Ferry traffic would use the eastern-most driveway, travel along a cordoned-off route at the south edge of the parking lot, and utilize cordoned-off parking spaces near the Municipal Dock. Coordination of ferry schedules with facility operating hours and efficient traffic management would make joint use feasible.

Landscape Concepts, Treatments, and Site Design Features: Three major landscape components are proposed: (1) a public space between the habitat area and the parking lot; (2) the parking lot; and (3) the buffer between the proposed project and the existing city park. A landscaping plan would be reviewed and approved by the city P&Z Commission as part of the Conditional Use Permit. Consultation with the SHPO on a Landscaping Plan would also be required as part of NHPA Section 106 compliance.

The proposed visitor parking lot adjacent to the education component of the project would be paved and striped, and would contain green islands planted with appropriate shoreline vegetation. Similarly vegetated strips would provide a buffer zone for the bike path at the northern edge of the visitor parking lot, and an improved setting for the historic elements within the adjacent city park.

The public space between the parking lot and the research habitats would have three essential subcomponents. One would be a hard surfaced public plaza in front of the main entrance to the facility. This open plaza would maintain and enhance the view corridor from Fourth Avenue, introduce the transition to the water's edge, and provide an opportunity for Seward public events. The plaza would bring visitors to the second subcomponent, a viewpoint at the existing Municipal Dock overlooking Resurrection Bay.

The third subcomponent would be the extensions and outcroppings of the rockwork habitat planted with appropriate shoreline vegetation. These outcroppings and plantings would offer visitors a resting place protected from winds. Like the habitat, the extensions and outcroppings would resemble rock formations of the region.

Stormwater Drainage System: It is estimated that approximately 80 percent of the 7 acre site would be covered by building structures, paved parking areas, sidewalks, and other impervious surfaces. A new on-site storm drainage system would be constructed to capture surface water runoff resulting from the proposed project. Additionally, there are two existing 24-inch city storm drain lines that cross the proposed building site and discharge into Resurrection Bay. These city lines would be consolidated with the proposed drainage system; with the line sized to accommodate the combined flow volume. A preliminary review of climatic conditions for Seward indicates that drainage structures should be designed for a peak rainfall of 2 inches per hour.

Schematic development plans include approximately 1,200 linear feet of 18-inch diameter, and 800 linear feet of 24-inch diameter, high density, polyethylene storm drain line. The storm drain system would also include approximately 15, 48-inch concrete catch basins. The entire system would have a single discharge point to the bay. Approximately 300 linear feet of existing 18-inch diameter storm drain line will be removed.

Project plans include an oil/water separator at the storm drain outfall location. This separator would be sized to accommodate runoff generated on-site and crossing the site from the city, estimated to be 5,000 gpm. Residue would be collected periodically and disposed of by a contracted hauler. This activity is regulated by EPA, ADEC, and ADOT/PF.

Construction Codes: The proposed construction would be designed to meet or exceed the requirements of the Uniform Building Code adopted by the City of Seward.

Foundation Design: Preliminary foundation recommendations indicate the new buildings and marine habitat tanks could be supported on shallow foundation systems. Building foundations would consist of conventional strip and spread footings. Basement areas, where life support systems are located, would utilize a slab-on-grade floor and concrete retaining wall. At grade, floor systems may be slabs on grade, or crawl spaces may be used, subject to mechanical requirements. For frost considerations, exterior footings would be buried at least 42 inches below final grade. Interior footings would be at least one foot below finished floor elevation or ground surface.

The foundation for the marine habitat tanks would likely be a thick concrete mat. This mat would distribute the weight of the water to the soil and provide for integrity of the tank should an earthquake cause loss of soil strength. All foundation designs will be developed in accordance with recommendations and requirements outlined in a detailed geotechnical program conducted in the proposed project area.

Structural Framing - Building: The complete framing system for this building has not yet been determined. Both steel frame and concrete bearing wall systems are under consideration. Floors would consist of concrete slabs supported by either steel or concrete beams. Roof framing would consist of steel or heavy timber framing supporting a metal or wood deck. Floor and roof framing could be supported by either load-bearing concrete or masonry walls, structural steel framing, or a combination of both.

The proposed structure would be designed in accordance with Uniform Building Code requirements for a seismic Zone 4 facility. Lateral loads from wind and seismic activity would be resisted by a system of horizontal diaphragms and vertical shear walls or braced steel frames. Diaphragms at the roof and floor levels would transfer lateral loads to the vertical shear-resisting walls or braced frames. Walls and braced frames would transfer lateral loads into the foundation. Shear-resisting diaphragms, and walls or braces, would be designed in accordance with the Uniform Building Code requirements.

Marine Habitat Tanks: The Marine habitat tanks would be designed for both hydrostatic and hydrodynamic pressures resulting from seismic events. American Water Works Association guidelines would be followed for tank design. The tanks would likely be formed and cast in-place with a high-strength, high-density concrete. Walls would resist hydrostatic pressures by cantilever action from the mat foundation or by buttress walls. Corrosion protection for the concrete reinforcing would be provided by a variety of methods which may include coating of reinforcing bar, densifying concrete, or using protective tank liners. The foundation mat for the tank would be protected against storm surges by a sheetpile bulkhead.

Fuel Storage: Heating fuel for the proposed facility would be locally available #1 and #2 fuel oil. The estimated fuel consumption for the proposed building is 100,000 gallons per year. Oil would be stored in an above ground, double-walled fuel tank with spill and overfill protection devices. An SPCC Plan will be prepared in accordance with EPA regulations prior to start of operation to address proper transfer, storage, and handling procedures. A 15,000 gallon fuel storage tank, approximately 12 feet in diameter

by 30 feet in length, is proposed. The tank's location would comply with all applicable codes including NFPA-13 which states that the tank must be located a minimum of 20 feet from property lines, and a minimum five feet from the building. The anticipated location of the fuel tank is near the loading dock on the north side of the outdoor research tanks and pools, approximately 200 feet from the waters of Resurrection Bay. The fuel tank would be screened from view and protected from loading dock traffic. Fuel piping to the building would be above ground and protected from physical damage by bollards.

The facility would have a stand-by, 750 kilowatt generator for emergency power situations.

Domestic Water Usage: Domestic water usage has been estimated to be 21,470 gallons per day (gpd) based on staff, visitor, and lab usage, for an average high day during the peak period of June 1 to September 15. These calculations are summarized in Table 2-2.

TABLE 2-2
DOMESTIC WATER USAGE
JUNE 1 TO SEPTEMBER 15

Usage	Requirement	Quantity
Staff	60 persons x 35 gpd[1]	2,100 gpd
Visitors	2914 persons x 5 gpd	14,570 gpd
Lab Sinks	5 gpm[2] x 16 hrs/day x 60 min/hr	4,800 gpd
	TOTAL	21,470 gpd

Source: PN&D
[1] gpd
[2] gpm

Water for domestic use would be supplied by the city. The current city water pressure near the site is 85 pounds per square inch (psi) static and 72 psi residual, which is sufficient for the proposed project. The size of a new water service line for the project would be approximately 6 inches in diameter. It would tie in to the existing city water main in Railway Avenue.

The existing city wastewater collection and treatment plant systems are capable of accommodating domestic effluent generated at the proposed facility. The city's plant is reportedly operating between 60 to 70 percent of capacity at the present time. Freshwater discharge can be disposed of to the city sewer system if it is processed to remove all hazardous materials. A 10-inch diameter, 25-foot long sanitary sewer line is anticipated to connect with the city system. Any saltwater must be disposed of through outfall lines to the bay.

An existing 22-inch diameter sewer main line would need to be relocated as part of the proposed project. Preliminary plans call for this line to be relocated in Railway Avenue. It is assumed that the new project sewer line would tie into this relocated line.

Life Support System: The LSS would supply seawater similar to natural conditions for the support of the live tanks, live pools, wet laboratories, and the research habitat. The LSS would be a partially-closed, loop system using a pressure sand filtration process with ozonation for disinfection and water quality enhancement as required.

The LSS for the proposed project is comprised of: duplicate intake pipelines and intake structures; a seawater intake wet well located within the building; a centrally located seawater supply pump room above the wet well; and various seawater supply distribution systems consisting of pumps, piping, valves, fittings, filters where required, flow meters, operating controls, etc. Each distribution system draws seawater from the wet well and supplies it to the respective research, rehabilitation, or marine habitat facility within the complex.

The following separate seawater supply distribution systems are included:

- Marine mammals and seabird habitat;
- Indoor research tank areas;
- Outdoor research tanks; and
- Quarantine facilities.

Each system would include at least two pumps (one to be redundant for emergency standby purposes), and a single pipe distribution system feeding the respective tanks or pools. A separate recirculation line would return a portion of the total system supply flow to the wet well; this ensures that the seawater in the piping distribution system is maintained similar to the conditions of Resurrection Bay. Filters would be used on some of the systems to remove suspended sediments.

Seawater Intake System

The seawater intake structures would be two perforated 24-inch pipes, approximately 400 feet in length, supported on concrete anchor blocks to keep the intakes off of the sea bottom and submerged at a 250 foot depth. The number of perforations would be calculated and determined on the basis of the established final design flow and on criterion to keep the intake velocity less than 0.1 feet per second.

Each intake structure and pipeline would be designed for the full flow requirements of the proposed project, estimated to be between 4,500 and 5,000 gpm. The second intake line is for redundancy and would allow maintenance on one line while the other is in service. A two-intake design provides the degree of reliability required for life support systems supplying ongoing research work.

The wet well is common to all seawater supply and distribution systems. It serves as a recirculation and monitoring chamber as well as an untreated (raw) seawater holding well. Because it is readily accessible,

it provides onshore storage and settling of untreated seawater. If both intake pipelines were to fail due to a seismic, or some other, event, temporary pumps could be used to transfer seawater directly from a beach intake to the wet well. This wet well concept therefore increases the reliability of the overall seawater intake and supply system.

Seawater Collection and Disposal Systems

Each seawater supply system will be augmented by seawater collection and disposal systems, depending upon the specific use of the seawater in the respective systems. Generally, used seawater is discharged into an outfall pipe which terminates at a depth of approximately 50 feet below mean lower low water (MLLW). A small amount of seawater (<500 gpm) from the uncontaminated research flow will be discharged to the future tide pool. Several categories of used seawater have been identified as follows:

- Clean Wastewater - Untreated (raw) or filtered seawater supplied to a research or holding tank or pool will be discharged directly to the disposal system outfall without treatment. Some of this seawater may also be directed or discharged through the proposed tidal pool.

- Contaminated Wastewater - Wastewater from holding and research tanks that may be contaminated would be separately collected and treated to disinfect, dechlorinate, or otherwise treat wastewater prior to discharge to the main outfall.

- Chlorinated Wastewater - Overflow wastewater from any marine mammal or seabird tank containing a chlorine residual would be separately collected and treated prior to discharge to the main outfall.

- Filter Backwash Water - All filter backwash water would be separately collected and would be discharged to the central treatment facility, as for other contaminated wastes. The following outlines the anticipated quantities of waste or spent seawater and the type of collection and disposal system (including waste treatment) required:

- Marine Mammals and Seabirds Habitat - Each marine mammal and seabird habitat tank (five total) will employ a self-contained recirculating LSS using high rate sand and gravel filters; biological filters where fish are held (11 smaller tanks); and disinfection facilities (ozone, chlorination, or a combination of both). The seawater make-up supply system to all of the five tanks would have a capacity of 500 gpm. Because these tanks include underwater viewing, the seawater make-up flow would be filtered using high rate sand and gravel filters for water clarity.
  Some of the overflow water from these tanks may be chlorinated (not greater than 0.5 parts per million [ppm] residual) such as the seal and sea lion tanks. The chlorinated overflows would be treated (with ozone) along with other wastes from the complex. Overflow water which is not chlorinated would be discharged to an outfall sump, along with other waste discharges, and then to the outfall pipe.

- Indoor Research Tanks - The seawater supply system to all indoor research tanks and pools would have a capacity of 500 gpm. The seawater supply will be untreated water. The used or spent seawater from some of these tanks or pools, if considered contaminated, would flow to the waste treatment facility prior to discharging to the outfall sump and outfall. Uncontaminated seawater emanating from these rehabilitation tanks and pools would discharge either through the proposed tidal pool or directly to the outfall.

- Outdoor Research Tanks - The seawater supply system to all outdoor research tanks would have a capacity of 3,200 gpm. This supply would be untreated water. The used or spent seawater emanating from the tanks would be either treated, if contaminated, and then discharged to the outfall; or discharged to the proposed tidal pool or to the outfall directly, if uncontaminated.

- Quarantine Areas - The seawater supply system to all quarantine work areas would have a capacity of 200 gpm. This supply would be untreated water. It is anticipated that all of the wastewater emanating from these work areas would be contaminated and that it would be separately collected and run through the treatment system prior to discharging into the outfall.

Marine Outfall

The marine outfall system would include a main collection sump on shore, and a 24-inch diameter outfall pipe with a perforated diffuser structure at the discharge end. The diffuser discharge structure would be located at a depth of approximately 50 feet below MLLW. A portion of the marine outfall system would flow through the tide pool infrastructure.

Freshwater Usage: Approximately 150 gpm of freshwater would be needed for fish genetics studies. A potential source for the freshwater has been located approximately 2,500 feet from the project site along Lowell Point Road. Preliminary investigation indicates that the source would provide a minimum of 300 gpm, the maximum capacity of the freshwater system. The water would be collected, filtered, and pumped to the site via a 4-inch pipeline in the city's utility corridor in Lowell Point Road. If water quantity and/or quality of this source is not adequate, other sources include wells drilled at the present IMS facility near the K.M. Rae Building, surface water (Lowell Creek), or water supplied from the city. A gravity fed storage tank would be required.

Approximately 50 gpm would be treated and discharged through the marine outfall; an estimated 100 gpm of uncontaminated freshwater would be discharged through the outfall. This estimated 150 gpm of treated and untreated freshwater would be added to the discharge water, which would dilute the salinity to a small degree. This water would primarily contain organics with some minor concentrations of fine sediment.

Small concentrations of halogenated compounds (chlorine and hypobromous acid) used in disinfecting surfaces and pools may also be contained in the discharge water. The concentration of these chemicals

in discharge water would be minimized by using freshwater for disinfectant washdown which would go into the sanitary sewer system. The surfaces near the mammal and marine bird pools would slope away from the holding water in the pool so that washdown water can be separated, further reducing the amount of these chemicals in the discharge water and separating the washdown water. The small amount of chemicals in the discharge water would be further diluted below levels which would effect marine fish or invertebrates.

Construction Schedule and Labor Projections: Construction of the proposed project would occur from December 1994 through the spring of 1997. Operation would begin during the summer of 1997. The construction schedule provides approximate windows of time within which each of the major on-site activities is expected to occur. Estimated on-site labor resources have been assigned to each major activity across its entire duration. By summing the labor component of each activity for each month, the required monthly on-site personnel is determined. It should be noted that in addition to craft personnel, such as carpenters and electricians, the workforce projections include non-manual personnel such as the project manager. It would not include, however, any labor performed off-site for prefabrication or assembly functions.

The estimated duration of on-site construction employment is from December 1994 to spring of 1997. A peak of 47 workers occurs in September 1995 when the workforce will be concentrating on getting the facility enclosed prior to the 1995 winter season. Approximately 1/3 of the work force is expected to be local hires.

To determine the approximate monthly on-site payroll, the labor requirements were multiplied by the anticipated hourly wages. When the monthly payroll amounts are accumulated, approximately $5.6 million in labor payroll is anticipated for on-site activities, with an estimated $1.8 million for local hire.

2.2.5 Operating Characteristics

The following operating information has been derived from two feasibility studies, one prepared by Thomas J. Martin and Fox Practical Marketing, the other prepared for Alaska Industrial Development and Export Authority (AIDEA) by Public Finance Management, Inc. Since publication of the Draft EIS, Martin and Fox substantiated their evaluation with up-to-date information (see Appendix C). More detailed and updated projections will be necessary as the project moves forward, and additional planning regarding refinements in the physical plant, project sizing, and program content are likely to occur.

These projections have assumed a well planned, constructed, and operated facility that creates a unique research and educational attraction. It is assumed that the project will be aggressively marketed and will receive full community support in the private and public sectors.

A non-profit Board of Directors would be charged with operating and maintaining the proposed project, as well as all budgetary matters. The following discussion provides operating assumptions, an estimate of potential revenues, and an estimate of operating expenses.

Operating Assumptions: The proposed project would operate from 10:00 a.m. to 9:00 p.m. in the summer, and from 10:00 a.m. to 4:00 p.m. in the winter. Special hours may be necessary to accommodate the cruise ship arrival and departure times and special events. The facility would be open every day in the summer and five to six days a week in winter, preferably closing mid-week. Special openings would accommodate school or tour groups in the winter season. The following admission prices are assumed for the discussion of revenues. Adult summer ticket price would be $12.50; children - $6.50 (children under two years old free); and a group ticket price of $11.00 per adult. A reduced ticket price may be offered in the off-season to encourage Alaska resident visitation. In the first year of operations this would result in $9.01 per capita admissions income.

In a typical year, approximately 85 percent of the total visitation should occur during the peak period of June 1 to September 15. Using the moderate assumptions of the PFM Study fifth year projection of 262,085 visitors to the proposed facility as a planning parameter, this results in 222,772 visitors in this 107-day period. Weekly attendance would average 14,570. Average high day counts are projected at 2,914. Assuming an average stay of 1-1/2 hours, peak accumulation within the facility is estimated at 875 people.

To determine maximum occupancy, the peak visitor count of 875 must be added to the employee count for that peak period time of 60, for a total peak occupancy of 935.

Using the moderate assumptions of the AIDEA Study prepared by PFM, the number and analysis of visitors to the proposed project in year one and two are provided in Table 2-3.

TABLE 2-3
VISITATION ASSUMPTIONS

Sector	Capture Rate	Population	Total
Seward Residents	70%	4,000	2,800
Cruise Ship Visitors	29%	160,000[1]	46,400
Non-Resident, Non-Cruise Ship	20%	378,000[2]	75,600
South Central/Alaska Residents	19%	538,000	102,220
Fall/Winter/Spring	7-10%	262,500[2]	23,531
TOTAL			250,551

[1] Estimated 1993 cruise ship passenger visitation to Seward lower.

[2] Estimated visitation to South Central Alaska.

Visitation to Seward is expected to increase in the fall, winter, and spring markets due to the proposed project. This number is expected to be approximately 23,531, made up primarily of students, visiting friends and relatives of South Central residents, and vacation pleasure visitors.

Based on projections in both feasibility studies, approximately 50,000 new visitors will be drawn to Seward as a result of the project. Almost 50 percent of the new visitors will be in the fall/winter/spring period. With 50,000 new visitors expected to visit Seward, the movement of the existing Seward visitors from the Small Boat Harbor and cruise line docks to the proposed project site at the south end of the city will create new traffic flows and increased visitor volumes in the downtown Seward area.

2.2.6 Projected Revenues

Potential revenue sources for the IMS Infrastructure Improvements Project are as follows:

- Admissions revenue;
- Parking fees;
- Retail shop revenue;
- Membership revenue;
- Research contracts;
- Rehabilitation program income;
- Grant and donations; and
- Miscellaneous income.

Admissions Revenue: The average first year achievable admission revenue is estimated at $9.01 per person, based on adult admission proceeds of $12.50. This pricing is based on the nature of the attraction, the distance that visitors (particularly tourists) come, and the visitor knowledge that the project supports research and environmental conservation. This pricing assumes a lower price in the off-season to encourage Alaska residents to attend at a discounted rate. It is also assumed that there will be 20,000 non-paying visitors and membership holders. Admission revenues are estimated at $2,361,386 annually.

Parking Fees: Although a fee would be charged for parking in the proposed project parking lot, it is not intended to be a source of revenue for the project. Validation of visitor attendance would offset parking fees for the approximate two hour visitor parking lot stay. Revenue generated from vehicles using the lot for longer periods of time or for other purposes have not been included in the project revenue assumptions.

Retail Shop Revenue: A retail shop with appropriate and varied educational merchandise would be an important part of the visitor experience, and can be an important revenue source. This element is assumed to perform at or above industry norms, and to generate $5.00 per visitor in retail sales, with a return of $2.50 after the cost of the goods sold. This provides a projected retail revenue of $ 655,200 annually.

Membership Revenue: Membership is typically made up of individuals and families who wish to contribute to the center, but who also appreciate the financial benefits that they can accrue, such as free admission, special events, and price reductions on merchandise. The number of anticipated members is based on price, the population of the area, the projected attendance at the center, and the experience of other aquariums. Based on these factors, a membership of 5,000 is projected. This annual average rate is composed of less expensive single, student, and couple memberships at $30; family memberships at $65; and donor level memberships at $100. Corporate/business memberships are projected at 100 annually at $1,000 each. This would result in $360,000 revenue from annual memberships.

Research Contracts: The presence of the proposed accredited facility will provide opportunities for the award of research grants, and for hosting researchers, particularly those working with marine mammals and marine birds. Potential public and private agencies and foundations that could fund research which would be appropriately undertaken at the facility include:

- University of Alaska, IMS;
- EVOS Trustees;
- ADF&G;
- NOAA;
- NBS;
- The Saltonstall/Kennedy program for the study of fisheries-related issues administered by the NMFS;
- The NMFS Office of Protected Resources which oversees many aspects of federal marine mammal protection programs;
- U.S. Marine Mammal Commission in Washington, D.C.;
- Center for Marine Conservation; and
- Other conservancy and philanthropic organizations.

The net income to the proposed facility from research is estimated at $246,000 annually.

Rehabilitation Program Revenue: The proposed project will provide facilities to support marine mammal rehabilitation activities in its region. The facility will be prepared to augment rescue and rehabilitation of injured marine mammals. Revenue potential is associated with three sources:

- Emergency Rehabilitation of Animals Brought to the Facility - It is estimated that a federally certified wildlife rehabilitation program and facility could draw significant grants and donations from individuals and private foundations. An estimated $200,000 annually could be raised through grants and donations.

- Contracts for Spill Response Capacity - The Oil Pollution Act of 1990 requires the formulation of a response plan for oil spill-related accidents that includes appropriate wildlife rehabilitation capacity. An appropriate response would be the on-going operating support of the IMS rehabilitation facility through the establishment of an endowment.

Investigations indicate that a reasonable estimate of funding potential from this source is up to $500,000 annually to support operations.

- Research on Marine Mammal Rehabilitation - A cross-over between research and rehabilitation is likely to occur, and major activities at the proposed facility would suggest the potential for the endowed scientists and EVOS restoration projects to generate such research proposals.

Because these sources of revenue are somewhat speculative at this time, a conservative income estimate of $150,000 for wildlife rehabilitation programs was used. It is clearly possible and probable that this number could be higher when a certified facility is in place.

Grants and Donations: Grants are for such activities as general operations, education and capital items, and refurbishment. Donations typically are from individuals and institutions. Similar facilities receive between three and ten percent of their revenue from this source. The forecast level of $150,000 annually is based on the experiences of comparable facilities.

Miscellaneous Income: Similar facilities receive additional income from a variety of miscellaneous sources. These include facility rental and catered events, interest and investment income, education programs, group travel programs, naturalist programs, and fund-raising events. Many facilities receive anywhere from five to 20 percent of their revenue from these sources. For the purposes of this analysis, a conservative assumption of $20,000 annually for miscellaneous income has been made. If the experience of other facilities is achieved in actual operation in Seward, then miscellaneous income will substantial exceed this amount.

The total estimated income in the first year of full operations is $3,900,000.

2.2.7 Projected Expenses

Projected expenses for the IMS Improvements Project are categorized by the following major functional categories:

- Personnel expenses;
- Administrative expenses;
- Plant operations expenses; and
- Curatorial expenses.

Personnel Expenses: The proposed project is a unique facility with a unique operating profile. Some functions, such as research, will go on equally throughout the year, while others, such as the visitor attendance, will be most active during the summer months. The staffing profile reflects this pattern, with a staff of 56 full- and part-time workers in the winter, and 67 full- and part-time workers in the peak summer months. Compensation levels for employees at the proposed project were developed by

reviewing information on wage rates and fringe benefits for workers in Alaska provided by the Alaska Department of Labor.

The total payroll for the proposed project based on this staffing load, is estimated at $1,965,600 annually.

Administrative Expenses: The administrative expenses include telephone and postage, professional fees and outside services, marketing, equipment, office supplies, insurance, printing and publications, professional development, travel, dues and subscriptions, and miscellaneous. The total administrative expense is estimated at $776,000 annually.

Facility Operations Expenses: This category includes utilities, supplies, equipment, building renewal and replacement, and outside services. The total facility operations expense is estimated at $720,000 annually.

Curatorial Services: This category includes specimen food, specimen purchase, and collecting and stranding trips. The total curatorial expenses for the proposed facility are estimated at $375,600 annually.

The total estimated annual expenses for Alternative I are $3,837,200.

As previously stated, revenue assumptions presented in this document are based on numerous studies but remain somewhat speculative. Should, at some unforeseen time, facility expenditures exceed revenues generated, facility operations would be curbed. Options would include reducing operating hours, thereby reducing staff and support functions, to compensate for the short fall.

2.3 ALTERNATIVE II - RESEARCH AND WILDLIFE REHABILITATION ONLY

Alternative II would have only one component, research and wildlife rehabilitation. The structures and facilities would generally be the same as described above under Alternative I, with the education and visitation components eliminated, including the 166-vehicle parking lot and public plaza.

2.3.1 Construction Program

The square footage of the indoor space with Alternative II would be approximately 49,000 square feet. The elimination of visitor related indoor space for this alternative, such as the auditorium, retail shop, and lobby would result in a reduction of the building footprint and massing. The upper level of the building would be eliminated, resulting in a one-story structure at approximately 17 feet above grade.

The outdoor areas for research habitat and research tanks and pools would be the same as for Alternative I, although the subsurface visitor walkway surrounding the tanks would be altered to accommodate researchers only. The proposed walkway would be a partially covered trench that allows researchers to view the animals and have access to animal haul out areas.

The parking requirement for Alternative II would be 50 vehicles for research staff and associated visitors. Parking would be made available in a newly constructed paved lot adjacent to the north of the existing IMS Rae Building parking lot, as described for Alternative I. A stormwater drainage system would be installed to connect with the city's existing line in Third Avenue. The visitor parking lot, plaza area, and its associated stormwater drainage system would be eliminated. The 90,000 square foot visitor parking lot and 67,000 square foot plaza area would be graded and landscaped and would be available for future expansion.

The capital construction cost of Alternative II would be reduced from Alternative I by approximately $10 million. This $10 million difference would not effect the EVOS funding, however, as funds for the education component are intended to come from private donations and fund raising efforts.

2.3.2 Operating Characteristics

This operating performance information for Alternative II is intended to provide a base of assumptions regarding the research-only facility revenue, expense, and operating income potential. This operating information has been derived by analyzing and revising operation assumptions for the project as originally planned with a visitor and education component. More detailed and updated projections will be necessary as the project moves forward, and additional planning regarding refinements in the physical plant, project sizing, and program content are also likely to occur.

These projections have assumed a well planned, constructed, and operated facility that creates a research facility only. In the first section, the operating assumptions are given; in the second section an estimate of potential revenues are projected; while in the third section, an estimate of expenses is made.

Operating Assumptions: As a research institution only, the proposed facility would operate from 8:00 a.m. to 5:00 p.m. Special hours for research activities and animal care would require 24-hour occupancy. The facility would be open seven days a week for the research staff. Public visitation to the proposed project would consist of occasional tours arranged upon request, much like the current IMS facility.

2.3.3 Projected Revenues

The potential revenue sources for the Alternative II are as follows:

- Research contracts;
- Rehabilitation program income; and
- Grants and donations.

Research Contracts: Research at the proposed project would consist of visiting scientists and in-house research positions. The researchers are all expected to be grant or contract funded, with the revenue for overhead support flowing to the facility and the general overhead staff support being carried as a cost of the facility. The net income to the facility is estimated at $246,000 annually, the same as Alternative I.

Marine Mammal Rehabilitation: Revenue potential from wildlife rehabilitation activities at the proposed facility is the same as with Alternative I described previously, conservatively estimated at $150,000 yearly.

Grants and Donations: As with Alternative I, a forecast level of $150,000 annually is estimated.

The total estimated income in the first year of full operations for Alternative II is $546,000.

2.3.4 Projected Expenses

Projected expenses for Alternative II are categorized by the following major functional categories:

- Personnel expenses;
- Administrative expenses;
- Plant operations expenses;
- Curatorial expenses.

Personnel Expenses: Projected staffing requirements for Alternative II are based on facility size, research functions, and rehabilitation components of the project. Research will go on equally throughout the year. The staffing profile reflects this pattern, with a staff of 26 year-round employees. Nearly one-half of those employees will be local hires. Compensation levels for the project were developed by reviewing information on wage rates and fringe benefits for workers in Alaska provided by the Alaska Department of Labor. The total annual payroll for Alternative II, based on this staffing, is estimated at $1,101,650.

Administrative Expenses: The administrative expenses include the same as those listed for Alternative I, with the exception of a marketing budget. Lower anticipated expenses reflect a reduced facility. The total annual administrative expense is estimated at $415,000.

Facility Operations Expenses: This category includes those listed for Alternative I. Again, total operational expenses are lower due to the smaller facility. The total plant operations expense is estimated at $580,000 annually.

Curatorial Services: This category includes specimen food and collecting and stranding trips. The total curatorial expenses are somewhat lower due to the smaller facility and are estimated at $345,000 annually.

The total estimated annual expenses for Alternative II are $2,441,650.

2.4 ALTERNATIVE III - NO ACTION

In addition to the two action alternatives, a No Action Alternative is evaluated in the EIS. The No Action Alternative required for consideration under NEPA regulations is interpreted in this EIS to mean no new

research/wildlife rehabilitation and public education/visitor facilities would be constructed on the IMS Seward Marine Center site at this time.

Under the No Action Alternative, the project sponsors would continue to use the limited laboratory facilities which exist in the state, and send other laboratory studies out of state. There would not be a facility primarily dedicated to the research needed to support the recovery of species injured as a result of the *Exxon Valdez* oil spill. The EVOS Trustee Council's capabilities to study marine mammals, marine birds, and the ecosystem injured by the *Exxon Valdez* oil spill would continue as currently exists.

2.5 SUMMARY OF MITIGATING MEASURES

2.5.1 Mitigating Measures as Part of the Proposed Action and Alternatives

The following mitigating measures are part of the proposed project to reduce or eliminate the potential adverse effects.

Geology and Soils:

- Limiting grading disturbances to essential project areas;
- Limiting, to the extent practical, the amount of cut and fill; and
- Stabilizing disturbed areas through revegetation as soon as it is practical.

Hydrology and Water Quality:

- Installing settling pond(s) or trench(es) to clarify discharges associated with de-watering activities prior to these waters being discharged to Resurrection Bay;
- Installing a stormwater drainage system to control the increased volume of stormwater discharge from site improvements;
- Installing an oil/water separator to ensure water quality of stormwater/discharge; and
- Treating facility seawater and freshwater before discharge to bay.

Air Quality:

- Requiring that a detailed inspection/maintenance program for construction equipment be implemented by the contractor to optimize engine performance and fuel efficiency;

- Using water or dust suppressants to control fugitive dust emissions;
- Encouraging higher vehicle occupancies for employees;
- Creating transit/shuttle bus service to the proposed facility;
- Improving pedestrian linkage to the proposed facility by sidewalks and marked pedestrian crossings; and
- Encouraging other non-auto travel modes for local travel by providing bike racks.

Noise:

- No construction would be performed within 1,000 feet of an occupied dwelling on Sundays, legal holidays, or between the hours of 10 p.m. and 6 a.m. on other days;
- All construction equipment would have muffled exhaust systems, and all construction equipment would have sound control devices no less effective than those provided as original equipment;
- Construction equipment would comply with applicable EPA equipment noise standards;
- No pile driving operations would be performed within 3,000 feet of an occupied dwelling on Sundays, legal holidays, or between the hours of 10 p.m. and 6 a.m. on other days;
- All pumps, generators, and chillers would be installed in the basement level of the buildings; and
- Vegetation would be planted between the facility and the Ladies Park and Railroad Depot to provide a noise buffer.

Wildlife and Marine Resources:

- To prevent attraction of wildlife, food and garbage would be stored in covered storage areas or closed containers;
- Captive birds would be isolated to prevent the possible transmission of disease from these birds to the local population;
- Marine mammals and birds would be protected from potential abuse and harassment by the public by attendant supervision and physical barriers, such as fences, walls, trenches, and glass partitions;

- The operation of the LSS will involve a seawater intake structure approximately 400 feet offshore and approximately 250 feet deep. This depth is well below the euphotic zone (where phytoplankton density is the highest) and below the freshwater lens which carries much of the silt load from local streams;

- Taking water from the 250 foot depth would minimize the entrainment of commercially important crustacean larvae (shrimp and crab), juvenile fish and larval fish, and other species which have planktonic life stages. These organisms are typically found in greater densities at higher levels in the water column. Biofouling organisms such as mussels, barnacles, and marine algae would also be much less prevalent at this depth;

- Intake structures would be elevated approximately 3 feet off the bottom of the seafloor to avoid interfering with benthic organisms;

- The intake pipes would be perforated with numerous one-inch holes to reduce the velocity of incoming water to approximately 0.1 feet/second, which would minimize the entrainment of small mobile organisms and larger marine fish and invertebrates;

- Wastewater sources would be treated by the facility treatment system, diluted, and discharged to 50 feet below MLLW via a specially designed outfall diffuser head, therefore, minimizing the concentration of contaminants from the facility, as well as minimizing organic buildup at the outfall location;

- The outfall structure would be a perforated pipe 24 inches in diameter and would have a flange end. The perforations can effect a dilution of the wastewater into the receiving water of up to 1:100. The dilution would greatly reduce any potential effect on the receiving water as far as temperature, salinity, or turbidity; and

- The concentration of disinfecting chemicals in discharge water would be minimized by using freshwater for disinfectant washdown to the sanitary sewer system. The surfaces near the marine mammal and marine bird pools would slope away from the holding water in the pool so that washdown water could be separated, further reducing the amount of chemicals remaining in the discharge water and separating the washdown water. The small amounts of chemicals in the discharge water would be further diluted below levels which would effect marine fish and invertebrates.

Vegetation, Wetlands, and Habitat:

- Creation of habitat through development of artificial tide pool habitat;

- Landscaping (i.e., revegetation of areas disturbed by construction, addition of vegetation where none existed before); and

- An armor rock face would be attached to the wave barrier to provide a surface for attaching organisms.

Visual/Aesthetics:

- In coordination with the SHPO and the city, integration of traditional non-industrial architectural elements to be compatible with the surrounding landscape and habitats;
- Public plaza in view corridor from Fourth Avenue; and
- Appropriate shoreline vegetation in parking lot islands, as a buffer between Ladies Park and the proposed facility, and integrated into rockwork of the habitat area.

Archaeological and Historic:

- A landscaping plan would be developed and reviewed by the city and the SHPO to minimize the effects of the proposed project on resources;
- Archaeological monitoring would occur during excavation; and
- Additional stipulations would be developed in a MOA between the DOI and the SHPO in compliance with Section 106 of the Historic Preservation Act.

Land and Shoreline Use:

- Fencing during construction;
- SAAMS financial assistance to the city for the relocation of the Youth/Teen Center activities;
- Assistance in the lease buy-out of NSHC;
- The public fishing area east of the project site would be kept available to public during construction and operation; and
- Accommodation of ferry traffic during construction and, if necessary, during operation.

Socioeconomics/Quality of Life:

- Percent of local procurement during construction and operation to stimulate Seward economy;
- Construction would not occur from 10:00 p.m. to 6:00 a.m;
- Dust levels during construction would be controlled by watering;

- Litter would be controlled on and around the site, including building materials, demolition materials and trash from the workforce. SAAMS would incorporate a "three Rs" policy - reduce, reuse, recycle - in all aspects of the facility;

- Although SAAMS is a non-profit organization and, as such, is legally eligible for exemption, sales tax generated from ticket sales and retail sales would be paid to the city and borough in compensation of property and revenue loss. This has been agreed to by SAAMS as a condition of the lease for the property;

- SAAMS has agreed to financially assist in the relocation of the Teen Center activities as a condition of their lease for the property. Because the project will displace this local recreational facility, the purpose would be to mitigate the lost opportunity for recreational activity there; and

- A condition of the construction bid package would be that the contractor provide temporary housing for construction workers.

Recreation and Tourism:

- To minimize the effect on city campground capacities, a condition of the construction bid package would be that the contractor provide temporary housing for construction workers.

Traffic and Transportation:

Construction

- Coordinate truck routes with the City Engineer. Truck traffic would be limited to designated routes.

- During construction, truck routes and schedules would be announced and published.

- If the Lowell Point Road quarry site is selected as a material source, SAAMS would work with the City of Seward to ensure that the structural integrity of the Lowell Creek Bridge would accommodate the increase in heavy vehicle traffic.

- During the period between mid-April and mid-May, load restrictions of 75 percent of maximum legal load may be in effect along the Seward Highway. Construction activity occurring during this period would be scheduled to comply with this condition.

- Sufficient employee parking would be supplied on-site to minimize the effect of construction activity on traffic and parking conditions in the site vicinity.

Street System

- SAAMS would work with the city to encourage the use of Third Avenue for IMS project traffic by locating information signs along street and highway approach routes.

- If the ferry dock remains at the Municipal Dock, resulting in on-going joint use, directional signing should be installed which separates ferry traffic from IMS traffic. IMS traffic would be directed to use Third Avenue and Railway Avenue; ferry traffic would be directed to the east on Railway Avenue, to Ballaine Boulevard, and D Street. SAAMS would work with city officials to determine the best approach to accomplish this.

- A variance would be sought from the P&Z Commission to allow off-site signing to be installed.

- A bus pull-out would be located on the south side of Railway Avenue to minimize the effect of bus loading activity on other Railway Avenue traffic.

- Railway Avenue would be reconstructed and resurfaced along the project frontage. The reconstruction would result in either a two lane section which maintains on-street parking (24 spaces) on the north side of the street, or a three lane section (with a center left turn lane) which eliminates these spaces.

Traffic Volume and Operations

- Adequate parking would be provided on-site to accommodate all anticipated visitor and employee traffic likely to occur on high demand days in July. This would minimize the excess circulation around the site which could occur if the parking supply was not adequate.

- Site access operations would be mitigated on peak visitor days by on-site parking and traffic management personnel. These personnel would assure that vehicles are parked in appropriate spaces (i.e. only RVs over 20 feet would park in the oversized RV stalls). A general plan for the operation of site traffic and parking will be developed in a Site Operations Plan.

Traffic Safety

- On-site parking/traffic personnel will manage potential conflicts between vehicles and pedestrians in the parking area and at driveway entrances, including the locations where the bike trail crosses the site driveways.

Parking

- All parking spaces would accommodate vehicles up to 20 feet long. A total of 15 spaces for over-sized vehicles up to 40 feet long are also provided. On-site parking management personnel would assure that the larger parking spaces are reserved for use by the larger vehicles.

- Use of the facility's on-site visitor parking lot would be limited by a maximum two hour parking validation with the facility attendants. This would encourage a "turn over" of available parking spaces. The cost of longer term parking would be economically impracticable past the attendance validation period.

Transit

- Charter buses would be encouraged by on-site traffic management personnel to layover off-site between dropping off and picking up visitors on peak visitor days. Buses would likely layover at locations currently used by the cruise ship and other tour buses. The most heavily used layover location is currently a gravel lot near the railroad dock.

Ferry

- If the ferry service and the proposed facility share operations at the site, on-site personnel would cordon-off an area of the visitor parking lot for ferry parking (vehicles waiting to load the ferry), still leaving 135 parking spaces available for visitor parking.

- Coordination with the Alaska Marine Highway System would occur to determine if specific ferry berthing schedule adjustments would be necessary to reduce the potential for joint site use.

- With city approval, off-site signing would be implemented to route ferry traffic as described above.

- The current project site plan, which has two driveways onto Railway Avenue, lends itself to joint use operation as ferry traffic could be directed to the easterly driveway and proposed project traffic could be directed to the westerly driveway. Signing and on-site traffic management would be implemented to accommodate further joint use operations.

Non-motorized Travel

- The proposed project would include bicycle racks on-site.

- The pedestrian/bicycle trail would be extended through the project site to provide for future development of the trail to the west.

- Intersecting points of proposed site driveways and the bike path would be protected by bollards.

2.5.2 Potential Mitigating Measures

The following mitigation could be implemented by SAAMS to further minimize effects.

- Arrangements made by SAAMS' contractor to use private campgrounds outside of Seward during the peak visitor months;

- The auditorium could be used as a sleeping area for school children on overnight field trips;

- Information signs could be installed to keep visitor traffic on Third Avenue to Railway Avenue and minimize congestion on other city streets;

- Buses could be encouraged to drop off and pick up visitors in one trip. This would reduce or eliminate empty bus trips;

- Each construction worker could be provided with a "Welcome to Seward" package with a map of facilities, businesses, recreation-sites, discount coupons, and community events;

- Open houses or public ceremonies could be held to mark major milestones in construction scheduling from ground breaking to completion;

- The new facility could provide volunteer opportunities to Seward residents, including high school students, such as work with the marine habitats and species. This could help mitigate some of the disturbances associated with construction of the project, and provide beneficial links between the facility and the community.

- SAAMS could coordinate with and assist the City of Seward's Historic Preservation Commission to renovate Ladies Park.

- Advance emergency procedures could be established with the hospital, ambulance service, police, and fire department to ensure effective service and to minimize effects of emergency calls to adjacent areas;

- For the RVs which arrive at the Iditarod Campground (part of the Waterfront Park) during construction and operation of the facility and cannot stay due to the reduced camping area, signage could be provided regarding other Seward area campgrounds to assist RV users in seeking out alternative sites. This could ensure the RV parking occurs in appropriate locations, provide good recreational opportunities, and will not impact Seward residents' property.

- Silt curtains could be installed in the immediate nearshore zone to minimize the extent of turbidity resulting from the removal of shoreline debris in the tidal and intertidal areas, and the action of installing sheet piling and armor rock materials to form the tidal pools and wildlife habitat areas; and

- Further restrictions could be placed on when construction activity may occur.

2.6 SUMMARY AND COMPARISON OF EFFECTS OF THE PROPOSED ACTION AND ALTERNATIVES

Chapter 2.0 provides a description of the proposed project and alternatives considered for the existing IMS Seward Marine Center. The purpose of the EIS is to provide sufficient information about the proposed project and alternatives, and an analysis of the potential effects of each. The discussion and analysis presented in this document provides a comparative look at the alternatives considered and their potential effects. This section provides a summary of that comparison. Table 2-4 provides the definitions assumed in the effects assessment as they apply to each environmental issue. Table 2-5 shows the comparison of alternatives, and the cumulative effects resulting from the proposed project when combined with the effects of other developments in the project vicinity.

The alternatives analyzed in this document include: Alternative I, the Proposed Action; Alternative II, Research and Wildlife Rehabilitation Only; and Alternative III, No Action. Alternatives I and II have both beneficial and unavoidable adverse effects. Both Alternatives I and II would provide the infrastructure for long-term research and monitoring of the ecosystem affected by the *Exxon Valdez* oil spill, with the goal of benefiting the long-term health and restoration of affected resources. The proposed facility of either alternative is intended to serve as a center for the coordination and integration of on-going and planned comprehensive research and monitoring of the EVOS area as part of an overall restoration plan.

Alternative III, the No Action Alternative, is not shown in Table 2-5. The effects associated with Alternative I or Alternative II would not occur with this alternative.

The main difference between Alternatives I and II is the type of facility intended for the site. Alternative I would provide a research and wildlife rehabilitation component and an education and visitation component to promote public awareness of marine habitat and wildlife conditions. Alternative II would eliminate project components that are visitor-related. Alternative II addresses the major effects resulting from Alternative I, specifically the influx of visitors to Seward.

The following is a discussion of the effects attributed to each alternative.

2.6.1 Soils and Geology

The effect of Alternative I on soils and geology at the proposed site would be short-term and limited to site preparation and construction activities. Excavation and fill would be required for building structures and for the habitat area at the water's edge.

Although the square footage of the proposed facility would be reduced by 26,000 square feet with Alternative II, the building footprint would not change significantly. Therefore, the area to be disturbed during construction is equivalent to Alternative I. The 90,000 square foot visitor parking lot and 67,000 square foot plaza area would be eliminated with Alternative II; however the parking lot and plaza area would be graded and landscaped.

Alternative I and Alternative II would have similar effects to soils and geologic conditions at the proposed project site; these effects, mainly construction related, are considered to be low due to the relatively small size of the site and the limited time frame of these activities.

2.6.2 Hydrology and Water Quality

The effects of Alternative I and Alternative II on hydrologic conditions and water quality in the project area are attributed to de-watering activities and stormwater runoff during construction and operation.

During operation, Alternative I would experience higher levels of stormwater runoff due to the increase in impervious area with the 90,000 square foot visitor parking lot and 67,000 square foot plaza area. A stormwater drainage system would be part of the project design to accommodate the increase in drainage. Additionally, the system would have an oil/water separator to intercept drainage from the site before it discharges into the bay. The system would incorporate an existing city stormwater line which currently discharges directly into the bay. Alternative I would provide a beneficial effect to Resurrection Bay with the use of the oil/water separator for project site drainage and city stormwater flow.

A potential source of freshwater for research purposes is a spring located approximately 2,500 feet west of the project site along Lowell Point Road. Another option is a well or wells drilled on the IMS campus; however, the site is not located in an aquifer recharge area and groundwater levels appear to be influenced by local seawater fluctuations. Freshwater could also be obtained form a surface source at Lowell Creek. Domestic water would be obtained from the city.

Alternative II would not require the visitor parking lot or plaza and, therefore, would not have the levels of stormwater runoff of Alternative I. A drainage system with oil/water separator would not be part of the project, and the city stormwater line would continue to flow untreated into the bay. Required volumes of water for domestic and research uses would be reduced by 40-percent due to the smaller size of the building and less people to be accommodated.

2.6.3 Air Quality

Construction activities for both Alternative I and II would increase the amount of regulated pollutants in the air. Operational effects on air quality would be attributed to the use of #1 and/or #2 heating fuels for heating purposes and, for Alternative I, increases in visitor/tourist/employee vehicle emissions.

Alternative II eliminates the visitor component, which minimizes the level of effect from car, bus, and RV air emissions. Additionally, Alternative II would have a smaller structure to heat, which would reduce both the need for fuel oil and the resulting emissions.

2.6.4 Noise

Noise generated from construction activities with either Alternative I or II would create a short-term, low level of effect to those in the project vicinity. Alternative II would have a slightly shorter construction period with the smaller building size and the absence of the visitor parking lot and plaza area.

The difference in noise levels generated from operation of the proposed facility would be due to the lack of visitor and traffic activity with Alternative II. With noise buffers between the facility and other public areas, the effect from the facility-related noise of Alternative I would be low.

2.6.5 Wildlife and Marine Resources

The proposed project area is active with human, vehicular, and mechanical activities and currently supports little wildlife. Construction of the wave barrier and tide pool with Alternative I or Alternative II would have a short-term, low-level effect on area wildlife. There are no operational differences between the two alternatives, with respect to the effect on wildlife.

The research and wildlife rehabilitation component of each alternative would have a long-term beneficial effect on wildlife. Information and experience gained from the project's research activities could have untold benefits to generations of wildlife.

A LSS would be required with both alternatives to maintain a healthy habitat for wildlife that is similar to that in the wild. The system processes and treats wastewater generated by the facility to ensure that water quality standards are met for discharge to the bay. The effects of the water intake and discharge system on marine microorganisms are considered to be low. The effect on the nearshore marine environment is also expected to be low.

The effects of Alternative I and Alternative II on wildlife and marine resources are similar.

2.6.6 Vegetation, Wetlands, and Habitat

Both action alternatives would result in a negligible to low level effect on vegetation, wetlands, and habitat. As previously mentioned, site work would require the same level of disturbance and would result

in the same level of revegetation and planting. A beneficial effect to habitat would be the tide pool and armor rock wave barrier proposed with both Alternative I and II.

Construction and operation of either Alternatives I or II would result in a beneficial/negligible effect to vegetation, wetlands, and habitat.

2.6.7 Visual/Aesthetics

The construction activities of either alternative would effect the view of Resurrection Bay. Several mitigating measures have been incorporated into the project design to minimize the visual effect of the proposed facility after construction. Alternative II would have a slightly less effect than Alternative I, primarily due to the smaller facility and lack of a visitor parking lot and plaza area. The structure proposed with Alternative II would be 26,000 square feet smaller, primarily from the second story of the building. Rather than a two-story building as proposed with Alternative I, the structure would be one-story with Alternative II, thereby reducing the effect of the visual change.

When comparing the effect of either alternative with existing conditions, the proposed facility would have a positive effect on the waterfront property.

2.6.8 Archaeological and Historic Resources

There are no known archaeological resources in the area of potential effect identified for the proposed project. There would be temporary effects on the setting of historic resources in the immediate vicinity of the proposed project from construction noise and dust. There would be a potential adverse effect on the Seward Machine Shop which is potentially eligible for inclusion on the NRHP. However, the MOA between the DOI, the SHPO, and consulting parties would contain measures to minimize any potential adverse effect.

2.6.9 Land and Shoreline Use

During the summer months of the construction period, a demand for short-term housing would occur; however, with the availability of a privately-owned construction work camp just outside of Seward and other private campgrounds, the increased demand should be met satisfactorily. Construction payroll would bring economic opportunities for businesses in Seward, and local hire and procurement of materials would provide an economic benefit to local commercial businesses. These conditions would be true for both Alternative I and Alternative II.

Both alternatives would result in the displacement of approximately 57 RV campsites, the NSHC warehouse, a machine shop, and the Youth/Teen Center. This would occur with the lease of land by the city to SAAMS for the project. Ferry service would relocate to another site in Seward. The lease of land to SAAMS for this project would require a replatting of the property, rezoning, and a CUP. Land use of the site would change from industrial and park to CBD. Both Alternatives have similar effects to land and shoreline use.

2.6.10 Socioeconomics

Construction-related effects to the social and economic environment of Seward would be similar with both alternatives. The reduction of facility size and elimination of program elements would produce a proportionally reduced effect on housing, new employment and payroll, demographics, and infrastructure demands in Seward. The beneficial economic effects would also be reduced.

The major difference in alternatives is related to the elimination of the education component during operation, and with it, tourist-related activity. Alternative II would provide a facility that has only a research and wildlife rehabilitation component. Visitors to the facility would be limited to occasional school groups or clubs. As a result, potential effects on employment, housing, population, traffic congestion, health services, and school systems would be reduced.

The quality of life in Seward is an important concern for local residents; a concern that is difficult to quantify because it varies with each individual. A beneficial effect on the quality of life could result from Alternative I with the influx of new and varied visitors who are interested in marine studies. Alternative I would also have a beneficial effect on economic conditions through the creation of employment, construction expenditures, and economic opportunities. Potential adverse effects would include an even more crowded condition in the summer months, increases in traffic and parking, and a reduced availability of recreational facilities due to crowding.

Alternative I of the proposed project depends, for the most part, on the education component for generation of operating revenue. Without the education facility, operating funds would be limited to research contracts, rehabilitation program income, and grants and donations.

2.6.11 Recreation and Tourism

The lease of land from the City of Seward to SAAMS for this project would displace up to 57 RV camping sites in the Iditarod Campground. This loss would occur with both Alternative I and II. With Alternative I, increased tourist traffic would effect the availability of recreation resources in the Seward area. There would be a minor effect on fishing and boating activities as a result of either alternative.

Alternative II would have a lesser effect on recreation resources and tourism than Alternative I.

2.6.12 Traffic and Transportation

In addition to the socioeconomic and tourism differences between Alternatives I and II, traffic and transportation would experience varying effects from the two actions. Overall, the effect of Alternative I on traffic, circulation, and parking is considered to be low to moderate as most of the potential effects are mitigated by the project design. The most notable effect of Alternative I would be on local transit as tourists circulate through Seward from the Small Boat Harbor to the project site. Alternative II would not have an effect on traffic, parking, or circulation. A parking lot for the estimated 50 staff members and researchers would be provided on the present IMS campus.

2.6.13 Conclusion

Table 2-4 provides the criteria used throughout the document to assess the level of potential effects of the proposed project alternatives (i.e., BENEFICIAL, NEGLIGIBLE, LOW, MODERATE, and HIGH). Table 2-5 is a summary of those effects by resource category. Chapter 4 of this EIS contains a comprehensive analysis of the potential effects; it is particularly important to refer to these analyses rather than to reference the summary table only as an indicator of potential effects.

As indicated in Table 2-5, the overall effects of Alternative I, the proposed project, are LOW to NEGLIGIBLE.

Exceptions to this include: a MODERATE effect on the quality of life in Seward during peak summer months; a LOW to MODERATE effect on recreation facilities and services; and LOW to MODERATE effects on traffic volumes, parking, local transit and ferry service.

BENEFICIAL effects of Alternative I would occur on water quality; marine mammals; vegetation and habitat; endangered and threatened species; site aesthetics; land use; local economy; public fiscal revenues; demographics; educational opportunities; city revenues; quality of life during off-peak tourist months; and facilities and services.

Overall potential effects of Alternative II would be NEGLIGIBLE to LOW. Exceptions include the LOW to MODERATE effect on recreation facilities and services due to the loss of campground sites.

BENEFICIAL effects of Alternative II would occur to endangered and threatened species, site aesthetics, local economy, educational opportunities, city revenues, and tourist facilities.

TABLE 2-4
DEFINITIONS ASSUMED IN EFFECTS ASSESSMENT

MAJOR ISSUES	HIGH	MODERATE	LOW	NEGLIGIBLE	BENEFICIAL
Soils and Geology	As a result of cuts and fills associated with construction, the potential for causing a major landslide exists.	Earth movement activities may result in small areas of soil instability.	Activity may cause minor, temporary earth movements during construction which would be stabilized through construction techniques or design features.	Activity does not change existing grades, or soil types.	Slope and/or soil stability is improved by activity.
Noise	Activity would permanently increase existing noise levels above local, state, or federal standards.	Activity would permanently increase existing noise levels by 10 dBA, but resulting levels would remain below local, state, or federal standards.	Activity may cause temporary increases in noise levels; or may permanently increase existing noise levels by less than 10 dBA.	Activity would not change existing noise levels.	Activity would result in a permanent decrease in existing noise levels.
Hydrology and Water Quality	A regulated contaminant is discharged from the project causing the concentration of the contaminant in receiving waters to exceed the concentration of regulatory controls.	A regulated contaminant is discharged causing the concentration of the contaminant in receiving waters to be of concern due to occasional peaks and/or multiple sources, but the concentration is generally below the concentration limit of regulatory controls.	A regulated contaminant is discharged and the resultant concentration of the contaminant in receiving waters is well below the concentration limit of regulatory controls.	No measurable change in the water quality of receiving waters.	Activity would eliminate or remove an existing source of water quality degradation; net result would be an improvement in water quality.
Air Quality	Emissions would be in violation of Federal standards for ambient air quality.	Emissions would result in pollutant concentrations that would approach the maximum levels permitted by Federal standards for ambient air quality and protection of existing air quality.	Emissions would result in pollutant concentrations that would not approach the maximum levels permitted by Federal standards for ambient air quality and protection of existing air quality.	No measurable change in air chemistry.	Activity would replace an existing source of air quality impacts; result of operation would be a net improvement (lowering) of air quality emissions.

Table 2-4
DEFINITIONS ASSUMED IN EFFECTS ASSESSMENT, (continued)

MAJOR ISSUES	HIGH	MODERATE	LOW	NEGLIGIBLE	BENEFICIAL
Wildlife & Marine Resources	A regional population or species declines in abundance and/or distribution beyond which natural recruitment would not return it to its former level within several generations.	A portion of a regional population changes in abundance and/or distribution over more than one generation, but is unlikely to affect the regional population.	Individuals of a population in a localized area and over a short time period (less than one generation) is affected.	No measurable change in local abundance or distribution.	Activity would provide new or improved habitat, *and* would have no measurable change or would cause an increase in species' population.
Vegetation and Wetlands Habitats	Habitat to be impacted is of high value for area species and is unique and irreplaceable on a national basis.	Habitat to be impacted is of high value for area species and is relatively scarce or becoming scarce on a national basis.	Habitat to be impacted is of low value for area species.	No measurable change in type, quantity or quality	New high quality vegetation and/or wetlands would be provided which would have a net increase over existing amount and quality.
Endangered and Threatened Species	A population decline resulting in a change in the distribution and/or abundance of the species with recovery in more than one generation or more than 10 years.	A population decline, resulting in a minor change in the distribution and/or abundance of the species. The expected duration of the effects on the population is 2 to 10 years.	No discernible population decline, but a number of individuals experience sublethal effects and would recover to pre-activity conditions within 1 to 3 years. Distribution changes affecting a low number of individuals in a small local area would last no longer than the described activity.	Activities that create a setting that causes an insignificant change to protected species populations.	Activity would enhance overall populations of protected species.
Visual	Visual quality is degraded to the extent that it affects all people in the area. Action results in minor reduction of property values.	Visual quality degraded to an extent which affects most people in the area. A minor reduction in nearby property values occurs.	Minor degradation in visual quality would be acceptable to most people. No reduction in area property values would occur.	No reduction in visual quality. No reduction in property values.	Visual quality of the project site is measurably improved.

Table 2-4
DEFINITIONS ASSUMED IN EFFECTS ASSESSMENT, (continued)

MAJOR ISSUES	HIGH	MODERATE	LOW	NEGLIGIBLE	BENEFICIAL
Archaeological and Historical (I)	Activities result in the loss of archaeological and historical resources or create an incompatible setting with historic resources of local, state, or national importance.	Activities result in the damage to archaeological or historical resources to create a significant degradation in the setting with historic resources of local, state, or national importance.	Activities result in the minor alteration of archaeological or historical resources or create a minor degradation in the setting with historic resources of local, state, or national importance.	Activities result in the minor disturbance of archaeological or historical resources but do not result in loss of value, or create a minor change in the setting with historic resources of local, state or national importance.	Activities result in the protection of archaeological or historical resources or create an improvement in the setting with historic resources of local, state, or national importance.
Land Use Plans and Shoreline Use	Activities are incompatible and displace a preferred land use, or conflict with four or more objectives and regulations of local, state, or federal land use plans.	Activities partially displace, infringe on or conflict with existing land use, or conflict with two objectives and regulations of local, state, or federal land use plans.	Activities infringe on or conflict with existing land use, or conflict with one objective and regulation of local, state, or federal land use plans.	Activities generally are compatible with existing land uses or conform with objectives and regulations of local, state, or federal land use plans.	Activities result in reduction of existing land use conflicts or establishment of a preferred use, or contribute to attaining compliance with objectives and regulations of local, state, or federal land use plans.
Economics	Economic effects that will significantly affect the economic well-being of residents of the area, i.e., a change in a local economic condition of 20% or greater, lasting for at least five years.	Economic effects that will moderately affect the economic well-being of residents of the area, i.e., a change in a local economic condition of 10-19%, lasting for up to five years.	Economic effects that will marginally affect the economic well-being of residents of the area, i.e., a change in a local economic condition of 5-10%, lasting for two to five years.	Economic effects that will only slightly affect the economic well-being of residents of the area, i.e., a change in a local economic condition of less than 5%, lasting for at least two years.	Economic effects that will have a positive influence on the well-being of residents of the area.
Social	Social effects that will significantly change the quality of life of residents of the area, i.e., a change in a local social condition of 20% or greater (if measurable), lasting for at least five years.	Social effects that will moderately change the quality of life of residents of the area, i.e., a change in a local social condition of 10-19% (if measurable), lasting for up to five years.	Social effects that will cause a minor change of the quality of life of residents of the area, i.e., a change in a local social condition of 5-10% (if measurable), for two to five years.	Social effects that will only marginally change the quality of life of residents of the area, i.e., a change in a local social condition of less than 5% (if measurable), lasting for at least two years.	Social effects that will have a positive influence on the quality of life of residents of the area.

Table 2-4
DEFINITIONS ASSUMED IN EFFECTS ASSESSMENT, (continued)

MAJOR ISSUES	HIGH	MODERATE	LOW	NEGLIGIBLE	BENEFICIAL
Recreation/Tourism	Activities result in the complete loss of recreation/tourism resources that are of local, state, or national importance, or create an adjacent incompatible setting with recreation/tourism resources of local, state, or national importance.	Activities result in the loss of more than 50% of recreation/tourism resources that are of local, state, or national importance, or create an adjacent setting that conflicts with recreation/tourism resources of local, state, or national importance.	Activities result in the loss of less than 50% of recreation/tourism resources that are of local, state, or national importance, or create an adjacent setting that causes degradation of recreation/tourism resources of local, state, or national importance.	Activities create an adjacent setting that causes minor degradation of recreation/tourism resources of local, state, or national importance.	Activities create additional recreation facilities, attractions or opportunities, or reduce or eliminate conflicts with recreation/tourism resources of local, state, or national importance.
Traffic and Transportation	Levels of service at area intersections would be degraded to Level F (lack of reserve capacity of roadway to accommodate side street traffic). Demand would represent 10 percent or more of total system demand and system is operating at capacity, or system operations would require significant modification to accommodate project demand.	Would represent 10 percent or more of total system demand and system is operating at near capacity; or demand would represent 25 percent or more of total system demand and system capacity is adequate to accommodate project demand without modification.	Would represent 10 percent or less of total system demand and system is operating at or near capacity; or demand would represent 25 percent or less of total system demand and system capacity is adequate to accommodate project demand without modification.	Would represent 5 percent or less of total system demand and system capacity is adequate to accommodate activity demand without modification.	Would decrease total system demand; or project would increase system capacity.

(1) There are separate but parallel and coordinated NEPA and NHPA Section 106 evaluations of effects on archaeological and historic resources. This table refers to NEPA definitions of effects; NHPA Section 106 uses definitions of adverse effect, no adverse effect, and no effect. See Sections 3.8 and 4.2.8 for discussions of the NEPA and NHPA Section 106 processes and evaluations.

TABLE 2-5
SUMMARY OF EFFECTS[1]

RESOURCE CATEGORY	ALTERNATIVE I, PROPOSED PROJECT	ALTERNATIVE II[2]	CUMULATIVE
Soils and Geology	Construction: LOW Operation: NEGLIGIBLE	LOW	NEGLIGIBLE
Hydrology	Construction: LOW Operation: NEGLIGIBLE/LOW	LOW	NEGLIGIBLE
Water Quality *Stormwater* *LSS Discharge* *Wastewater*	Construction: LOW Operation: BENEFICIAL Operation: LOW Operation: LOW	LOW LOW	NEGLIGIBLE
Air Quality	Construction: LOW Operation: LOW/NEGLIGIBLE	LOW	LOW
Noise	Construction: LOW Operation: LOW	LOW	LOW
Wildlife Resources *Marine Birds* *Marine Mammals* *Marine Resources*	Construction: LOW Operation: NEGLIGIBLE Operation: BENEFICIAL/LOW/NEGLIGIBLE Operation: LOW	LOW	LOW
Vegetation, Wetlands, Habitat	Construction: NEGLIGIBLE/LOW Operation: NEGLIGIBLE/BENEFICIAL	LOW/NEGLIGIBLE	NEGLIGIBLE
Endangered and Threatened Species	Construction: NEGLIGIBLE Operation: BENEFICIAL/NEGLIGIBLE	NEGLIGIBLE/BENEFICIAL	NEGLIGIBLE
Visual	Construction: LOW Operation: BENEFICIAL	BENEFICIAL	BENEFICIAL
Archaeological and Historic	Construction: LOW Operation: NEGLIGIBLE	NEGLIGIBLE	LOW
Land and Shoreline Use	Construction: LOW/BENEFICIAL Operation: LOW	LOW	NEGLIGIBLE

TABLE 2-5
SUMMARY OF EFFECTS
(continued)

RESOURCE CATEGORY	ALTERNATIVE I, PROPOSED PROJECT	ALTERNATIVE II[2]	CUMULATIVE
Socioeconomic	Construction:		
Economy	BENEFICIAL		
Demographics	NEGLIGIBLE		
Infrastructure and Services	LOW		
Public Fiscal	BENEFICIAL/NEGLIGIBLE		
Quality of Life	LOW		LOW
Socioeconomic	Operation:		
Economy	BENEFICIAL	BENEFICIAL	
Demographics	NEGLIGIBLE/BENEFICIAL	NEGLIGIBLE	
Infrastructure and Services	NEGLIGIBLE/LOW	NEGLIGIBLE/LOW	
Education	BENEFICIAL	BENEFICIAL	
School System	LOW	LOW	
Public Fiscal			
City Revenues	BENEFICIAL	BENEFICIAL	
City Expenditures	LOW	LOW	
Quality of Life	MODERATE/BENEFICIAL[3]	BENEFICIAL/LOW	
			MODERATE
Recreation and Tourism	Construction: LOW/MODERATE[3]		
Recreation Facilities & Services	Operation: LOW/MODERATE	LOW/MODERATE	
Tourist Facilities & Services	BENEFICIAL	BENEFICIAL	BENEFICIAL

TABLE 2-5
SUMMARY OF EFFECTS
(continued)

RESOURCE CATEGORY	ALTERNATIVE I, PROPOSED PROJECT	ALTERNATIVE II[2]	CUMULATIVE
Traffic and Transportation[4]	Construction: LOW		
Option 1	MODERATE		MODERATE
Street System	Operation: NEGLIGIBLE	NEGLIGIBLE	
Traffic Volumes	MODERATE/LOW	NEGLIGIBLE	
Traffic Operations	LOW	NEGLIGIBLE	
Traffic Safety	LOW	NEGLIGIBLE	
Parking	LOW/MODERATE	NEGLIGIBLE	
Transit	MODERATE	NEGLIGIBLE	
Rail Services	NEGLIGIBLE	NEGLIGIBLE	
Ferry Services	NEGLIGIBLE	NEGLIGIBLE	
Option 2		NEGLIGIBLE	MODERATE
Cruise Ships	LOW	NEGLIGIBLE	
Non-Motorized	NEGLIGIBLE	NEGLIGIBLE	
Ferry Service	LOW/MODERATE		

[1]Refer to Table 2-4 for the definitions of levels of effect for each resource category.

[2]Effects of construction for Alternative II would be similar to those of Alternative I. The duration of effects would be less with Alternative II, but the conclusions for effects would remain the same.

[3]The overall effect of the proposed project is dependent on peak and off-peak seasons, which is reflected in the range of potential effects.

[4]Effects on Traffic and Transportation range from Negligible to Moderate. The project assumes that ferry service will be relocated to another Seward location at some time. Option 1 considers the effects of ferry service remaining at the site during construction. Option 2 considers the effects of ferry service remaining through potential operations.

Note: Alternative III (No Action Alternative) -- The effects associated with Alternative I or Alternative II would not occur with this alternative.