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EXXON

WASTE MANAGEMENT SCOPING PLAN



May 1, 1989

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May 1, 1989

WASTE MANAGEMENT PLAN

I. INTRODUCTION

While waste management discussions have been held with all interested parties since the early days of the spill response effort and draft portions of the plan have been distributed for review and comment, this is the first formal publication of the overall Waste Management Plan. Since the cleanup is not complete, the quantities of waste materials are estimates. The timing and equipment requirements will vary as final volumes are defined. Consequently, this plan is categorized as a scoping plan at this time.

This is the last of the major plans to be developed. This is not a critical path item, and action must of necessity follow the cleanup actions.

It is too early to establish specific milestones. These will be generated in June when we have a better definition of all of the key factors.

This plan is dependent upon making extensive use of existing treatment and disposal facilities at the Alyeska Valdez Terminal. As with other phases of the spill response, Alyeska has been cooperative and helpful in developing and implementing waste disposal plans. Use of the Alyeska facilities will also require cooperation from the regulatory agencies to rapidly issue letters of non-objection, waivers, or permit modifications as required. If use of these facilities is not possible, then significant changes in this plan would be required.

This effort will be supported by the telecommunications, safety, and training programs that have been described in other plans.

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II. OVERVIEW

OVERALL GOAL:

To establish a sound operational program to handle and dispose of all spill related wastes in a safe, environmentally sound manner and in accordance with all applicable laws and regulations.

WASTE MANAGEMENT PRINCIPLES:

Figure 1 summarizes the overall management approach taken for the wastes generated from the spill response effort. A summary of the waste types and estimated quantities are provided in Table 1. The following principles were included in developing the plan.

- Provide safe working conditions
- Minimize risk of pollution incidents in all operations
- Treat/reclaim liquid wastes to remove:
 - + Oil from water
 - + Trash/kelp from oils
- Segregate oily wastes, trash and expired animals
- Store oily solid wastes in bags, controlled areas, and containers
- Handle and transport oily wastes in appropriate containers/tanks
- Transport solids/semi-solids from remote areas to central areas for incineration or landfilling
- Landfill non-oily trash and ash from incinerators

REGULATORY APPROVALS/PERMITS:

Exxon and its Contractors are working with local officials, the Alaska Department of Environmental Conservation, other State and Federal Agencies, particularly the U.S. Coast Guard and the EPA, to ensure all oily wastes from the spill are handled in the appropriate manner. Exxon and its Contractors are providing the necessary information and data so that waste disposal approvals or permits, where needed, are not holding up the implementation of any oil spill response activities, particularly shoreline restoration operations. We have been providing this information to interested parties early and throughout the planning phase, and have not waited for publication of this scoping plan. We are concerned that the approval process might be a delay factor.

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III. WASTE TREATMENT/DISPOSAL/STUDIES CONSIDERATIONS

ENVIRONMENTAL STANDARDS

A detailed review of applicable standards has resulted in the following basis for waste management activities:

- WATER The plan is to send all oily wastewaters (excluding sewage) from cleanup and skimming operations to the Alyeska Terminal advanced wastewater treatment facility. Wastewater treatment experts from Exxon and Alyeska will insure that the handling of the spill associated waters, which are similar to ballast waters now treated at the terminal, will meet the appropriate permit requirements. EPA and DEC have advised that no additional permits would be required for this and that the existing Alyeska effluent standards must continue to be met.
- AIR Disposal of solid wastes will be by incineration and landfilling. Incineration will occur in equipment that is carefully selected for the complexity and types of spill debris/wastes that are generated.
- LAND Landfills have been evaluated for their capabilities, performance, and regulatory track record.

The following air emission requirements are the basis for the design, permitting, and operation of the incineration units:

- No permit required for units less than 1000 lb/hr feed rate
- DEC Permit required for incinerators above 1,000 lb/hr (18 AAC 50.300)
- No black smoke emission will be allowed
- Opacity of 20% (18 AAC 50.040)
- Particulate matter emissions of 0.15 grains/SCF corrected to 12% CO₂ (18 AAC 50.040) for incinerators with a feed capacity of between 1,000-2,000 lb/hr (18AAC 50.040)
- Particulate matter emissions of 0.08 grains/SCF corrected to 12% CO₂ for incinerators with a feed capacity of over 2,000 lb/hr (24T/day) (18AAC 50.040)
- Formal PSD Permit/review will not be required
- Hospital rated incinerators for all expired animals

TRANSPORTATION: All waste materials will be transported in appropriate ways in accordance with DOT and U.S. Coast Guard regulations. Appropriate certifications will be obtained for barge units that will house mobile incineration systems.

LIQUID WASTES

The liquid wastes generated from the overall spill response are very similar to those generated in production, refining and petroleum terminal operations: oily water mixtures and emulsions. The technology for handling these liquids is well known. The basic approach is to separate the oil from the water, break the emulsions with heat and/or demulsifiers, and then reclaim the usable oil and treat the wastewaters prior to disposal. Table 1 provides a summary of the liquid wastes and quantities.

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The largest volume of liquid material is the oil and water from offshore skimmer operations. These liquids are being stored in barges. The water from these barges will be drawn off to a separate "water" barge and then sent to Alyeska's Ballast Water Treatment system.

The remaining oil in the barges is intermixed with kelp and trash and may not be pumpable because of weathering. The current plan is to add fresh oil and/or demulsifiers to make the oil pumpable and break the emulsions. The oil would then be strained and pumped into a "clean" oil barge. This oil would be further cleaned, if needed, and transferred to an Exxon tanker for shipment to a Refinery for processing into petroleum products.

Oil that is too contaminated for refinery processing will be processed at Alyeska's crude tank sludge pit. The resulting solid material will be incinerated.

The remaining wastewaters would be treated at the Alyeska Ballast Water Treatment plant. The alternative of setting up a special packaged wastewater treatment system somewhere in the Valdez area would take a long time to permit and implement. Another option is to barge the wastewater to some other secondary wastewater treatment facility meant to handle organic compounds. The Valdez sewage treatment plant was not considered for the treatment because the wastewater volumes and variability would likely upset the system. The best operational plan is to treat the wastewater at the Alyeska terminal, which has a permitted system designed to handle oily wastewater.

SOLID OR SEMI-SOLID WASTES

There are basically 2 options for the ultimate disposal of solid oily material and debris from an oil spill: Incineration and Secure Landfilling. Cleaning and recovery of this material, as proposed by many vendors/contractors, with its diversity in size and characteristics, and large scale, is not practical and would lead to greater risks of causing further pollution incidents. Hence, incineration and secure landfilling were chosen as the treatment and disposal methods.

Incineration was chosen because of the logistical and operational efficiency and early availability of some units. Landfilling was chosen because of its proven technology, rapidity with which it can be implemented, and ability to handle widely varying waste generation rates. All of the "hazardous waste" in Alaska is now packaged, pretreated and transported to disposal sites in the Lower 48 States. Although the oil spill debris is not a hazardous waste, Exxon wants to make sure that the materials are handled and disposed of properly at a secure site. A special technology evaluation group at Valdez and at our research facilities in New Jersey has identified the necessary requirements and locations for secure landfilling.

Several factors were considered in defining the types of incineration systems matching the complex waste sizes and characteristics for the oil spill response and environmental regulations. Another team of experts was assembled at Valdez and in New Jersey research facilities to rapidly screen and evaluate several types of systems, their availability on short notice, and their flexibility in handling diverse types of oily wastes. These groups evaluated the capabilities and availability of virtually all types of incinerators worldwide. A multi-type incinerator approach was chosen to handle the volumes and types of wastes.

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Hospital rated incinerators are needed for expired animals; these units can also handle oily sorbents/rags and other bagged oily debris, but at a lower feed rate because of its high heat capacity. These units are all under a 1,000 lb per hour feed rate. Three units have been contracted for immediate delivery. These units take a minimum amount of time to install and they will augment the municipal trash incinerator at Whittier, which has been approved for use on oily wastes, and the Alyeska incinerator that has been burning spill related oily wastes. Five incinerators will be operating by about mid-May to dispose of oily wastes, with 4 of them capable of handling expired animals should the Fish and Wildlife Service need to dispose of them. Four units will be central to the Valdez area, where the waste material storage capability is being developed, and one unit at Whittier.

A large silo hearth type incinerator (barge mounted) that will have a capacity of 3-5 times the capacity of the above units is to be the primary incinerator for disposal of oily wastes. This type of unit was chosen because of its early availability (May, 1989), flexible feed capability (e.g. chipper for large logs), and low particulate emission levels via baghouse control. The silo burner is a simple, proven design for burning logs, timber wastes and municipal trash, which have a very heterogeneous character. It does not require as much of feed handling and size reduction as other rotary kiln and fluid bed incinerators.

Transportable rotary kiln incinerators are another option where specific proposals have been evaluated by the expert incinerator/waste management team. These units have multifeed capability from contaminated soils to sludges to high BTU debris. Their capacity is significantly reduced, however, on high BTU materials such as the anticipated oil spill debris. These are complex and have been used to date primarily for low BTU hazardous wastes, such as PCB's, and contaminated soil at Superfund Sites. They have feed size limitations (most less than 4 inches) that could pose problems for the anticipated oil spill materials. The shorelines that have been impacted are very rocky and are not expected to generate significant quantities of oil contaminated soils, since the shorelines will be cleaned primarily by water. However, the rotary kiln units with sufficient capacity and the shortest delivery times have been identified. These will be contracted for to assist in the waste disposal, if necessary. Specialized shredders have been identified to provide additional capability to handle debris of the varying sizes and handling characteristics expected.

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IV. LIQUID WASTE MANAGEMENT

INTRODUCTION

This portion of the plan describes the overall handling, treatment and storage operations for all oily liquid wastes generated as a result of the oil spill response. Figure 2 provides an overview of the liquid waste management plans.

Sewage treatment is not included here. The plan is to continue treating and disposing of sewage using the City of Valdez and other existing sewage systems. However, a study team is looking at options in case the amounts, especially during the tourist season, exceed existing municipal or remote capabilities.

A major part of the liquid management plan is use of Alyeska's Ballast Water Treatment facility, oily sludge pit, oil/water separators and emulsion handling equipment. Exxon waste management experts and coordinators are working with Alyeska Terminal engineers and operators to accommodate these liquids so as to minimize potential disruptions to Alyeska's system or cause effluent discharge permit problems.

Low volumes of oily wastewaters will be generated from equipment and boat washing activities, and from rainwater and other drainage collection areas where oily debris is stored. Larger volumes of water removed from skimmers and storage barges, after crude oil/water mixtures are separated, will be the major source of waste liquids. Clean and trash contaminated oils will also result from the offshore and onshore cleanup activities.

The basic liquid waste management objectives are:

- Collect oil and water mixtures in a controlled, efficient way
- Store oil and wastewaters in secure areas, onshore and offshore
- Transport liquid wastes in a controlled manner to prevent pollution risks or recontamination of cleaned areas
- Separate and reclaim as much useable oil for refinery processing
- Dispose of treated oily waters in an environmentally sound manner

WASTE PROFILE/CHARACTERISTICS/TREATMENT

The liquid wastes covered by this plan are characterized as follows.

Wastewaters from Washing and Cleaning Operations; Storage Impoundments

Wastewaters generated from onshore and offshore equipment washing and cleaning operations and wastewaters from storage impoundments, such as the oily debris storage pit, will be treated in Alyeska's Ballast Water Treatment system (see attached Figure 3). The system now treats nearly 20 million gallons per day of tanker ballast water and other oily wastewaters. Equipment washing will be performed primarily by high pressure water washes and steam cleaning. Degreasing agents may also be employed when needed. These agents will be carefully selected so as to be effective, approved and of the type that will not cause emulsions or

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stable oily water dispersions. Low toxicity cleaners such as SIMPLE GREEN or DE-SOLVE-IT have already been approved for use by the DEC for "in the water" boat cleaning operations. Other agents similar to those currently used by Alyeska may also be employed.

Onshore equipment washing will be performed in a manner that allows oily waste waters to be contained and collected. These wastewaters will be trucked to the Alyeska Terminal for treatment.

The following procedures were developed to handle these liquid wastes in a controlled way to prevent problems at the Alyeska Terminal:

1. Each liquid waste load sent to Alyeska will be manifested showing the date, point of loading, quantity and nature of material, amount of oil and grease in wastewaters, departure time, and arrival time at Alyeska terminal.
2. Prior to removing wastewaters from the washing operations or bag storage pits runoff, floating oil or oil sheens in the vicinity of the vacuum truck suction point will be removed using sorbent material. A ring of sorbent boom approximately three feet in diameter is to be placed on the surface of the pit and vacuum truck suction will be taken from within this ring. This is intended to prevent any additional sheens from being withdrawn by the vacuum truck.
3. During or upon completion of loading each vacuum truck, a water sample will be taken and tested for oil and grease using a portable Horiba oil in water analyzer. The results of this test are to be recorded in parts per million on the manifest.
4. The wastewaters with low oil and grease content will be discharged directly into the front end of the Alyeska Ballast Water Treatment system.
5. The wastewaters with higher oil and grease concentration will be discharged into the recovered oil and oil/ water emulsion line that feeds into the oil/water separators.

Oily Wastewaters from All Oil Skimming and Collection Operations

A large amount of oil and water has been and will be collected as part of the extensive offshore skimming operations and the skimming in support of water flushing of the shoreline cleaning effort. These liquids are now being stored on five offshore barges.

The current plan is to drain the water from these barges onto a 60,000 bbl barge present at the scene. Other barges may be used as appropriate. Oily waters from the skimming operations are similar to oily ballast waters that are now treated at the Alyeska Terminal. An alternate plan would be to off-load barge water directly to the terminal. The oily water that is sent to Alyeska will be handled in a controlled way, so as to minimize the excessive loading on the treatment system. It will be bled into the system at a rate that allows adequate separation of the oil and water to occur in the Series 90 Tanks.

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- Each load will be manifested, showing the date, time, point of loading, quantity and nature of the waters, departure time and arrival time at the Alyeska Terminal. A representative sample of the wastewater will be obtained for oil-in-water analysis by the portable Horiba instrument or by laboratory analysis.
- All the oily water discharged to the Terminal that appears to have a high oil content, either visually or by "on the spot" analysis using the Horiba instrument, will be sent to recovered oil line for processing in the oil-water separation tanks (Series 80 tanks) rather than the sludge pit water line going to the Series 90 Tanks.

Heavily Oiled Kelp and Trash Contaminated Oils

A recent review of the types of material that are being collected and skimmed shows that there is a considerable amount of oiled kelp and small trash in the skimmed oil. The current plan is to off-load the separated water from the large offshore storage barges, until only oil remains. Whole crude oil and demulsifier agents will be added to the barge to make the oil pumpable and to break out the remaining water from the oily water emulsions. The oil will be strained and off-loaded to another barge that will store the "clean" oil. This oil will be transported by the barge or off-loaded to an Exxon tanker headed for West Coast Refineries. The oil will be discharged to the refinery crude storage system or to the refinery slop oil system for processing into refined petroleum products.

However, some skimmed oils are heavily laden with kelp and other trash. Additionally, heavily oiled kelp is being collected. These semi-solid or liquid wastes will need special handling. If they are very solid in form, they will be incinerated with the solid wastes. If they are semi-liquid with a high water content, they will undergo special treatment at the Alyeska Terminal sludge pit/drying bed. Once the water is removed, the remaining oily solid trash/kelp will be scooped up, put in poly bags or containers and incinerated.

"Fishing Boat Collected" Oil from the Container Dock Area

Small fishing boats are bringing in 5 gallon sealed top pails and some 80 gallon hard plastic overpack drums filled with oil collected on the water. The oil is temporarily collected at the City of Valdez container dock in a controlled area. This oil will be processed in the same way as other oily liquids. The plan is to vacuum truck the material directly, or after it is manually put in intermediate storage/separation tanks, to Alyeska's skimmed oil/emulsion treating tanks (Series 80). The oil will be reclaimed and the separated water will be discharged into the Alyeska advanced wastewater treatment facility. An alternative plan is to send the oil directly to oil recyclers.

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V. SOLID WASTE MANAGEMENT

INTRODUCTION

This portion of the plan describes the overall transportation, storage and disposal operations for all solid wastes generated from cleanup activities (see Figure 4). The basic solid waste management objectives are to:

- Dispose of solid wastes in an environmentally sound and operationally efficient manner
- Provide environmentally sound short-term storage sites
- Minimize overall pollution potential associated with transporting, storing, and disposing of solid wastes while ensuring the disposal of solid wastes does not limit or restrict cleanup operations
- Describe Exxon's plan to regulatory agencies to facilitate identifying and obtaining all necessary permits or approvals required to carry out the storage and disposal activities.

Specific storage and incinerator locations have been identified, and landfill sites are currently being evaluated. The rate at which oily wastes will be generated and the total quantities are being estimated.

The basic strategy is to implement small scale incineration, large scale incineration and landfilling as rapidly as possible. This provides flexibility to accommodate permitting delays or equipment problems and ensures that waste disposal can occur at a rate that will not limit shoreline restoration activities. As operational experience is gained, one or more of the methods may be suspended in favor of the others.

WASTE PROFILE/CHARACTERISTICS

The solid wastes being addressed by this plan are characterized as follows:

Non-oily wastes

Non-oily wastes are generated from numerous sources associated with offshore operations such as:

- Household-type wastes from camp operations
- Scrap wood and other materials from construction activities
- Scrap equipment from response activities such as worn out pumps, hoses, boom, etc.

All oily wastes from camp and other activities are to be segregated from non-oily wastes and handled with oily wastes from cleanup activities. The non-oily wastes will be transported to Valdez for disposal at the City landfill or other suitable landfills.

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Oily Wastes

The oily wastes covered by this plan are largely composed of sorbent boom, sorbent pads, snares, rags, clothing and debris contaminated by spilled or recovered crude oil. Oily solid wastes from camp and construction activities, boat cleaning, equipment cleaning, and other similar activities will be included. Oily materials will generally be placed in plastic bags to prevent pollution and facilitate the handling of recovered materials. Larger items such as oiled driftwood may be directly transferred to the burner barge or storage barge as described under disposal. Oiled driftwood may also be treated by washing or by burning the oil off with weed burners, as is currently practiced by the U.S. Coast Guard.

Animal Carcasses

Animal carcasses will be handled and stored separately from other solid wastes. There are existing procedures that specify all carcasses are to be delivered to the U. S. Fish & Wildlife Service (USFWS). When the USFWS wishes to dispose of the carcasses, they will be incinerated in the hospital type incinerators (designed for special pathological wastes) at the Valdez area incineration site or in Alyeska's incinerator. The carcasses will be kept separate from other wastes to be incinerated and handled on a priority basis to ensure they are not improperly stored and allowed to decompose.

Incinerator Ash

It is expected that sorbent materials and other oily debris will burn clean and leave relatively little ash. Final disposal will be in the City of Valdez landfill. Although the oily wastes are not hazardous wastes under RCRA, representative ash products from each incinerator will be tested.

Oily Booms/Oil Spill Response Equipment

Although most oil spill response equipment will be cleaned in anticipation of reuse, some will undoubtedly be damaged beyond repair. Before incinerating any items constructed of plastics, they will be checked to ensure they do not contain significant amounts of polychlorinated materials. Pieces of equipment that are not burnable, will be cleaned and disposed of at the Valdez landfill. Consistent with Exxon's Shoreline Restoration Execution Plan (4/15/89), we do not anticipate removal or disposal of significant quantities of oiled rocks or sand.

TRANSPORTATION, STORAGE AND DISPOSAL OF NON-OILY WASTES

Non-oily wastes including domestic wastes, scrap equipment, waste construction materials, and ash from offshore incinerator operations will be segregated from oily solid wastes and transported by barge to Valdez and then by truck to the City of Valdez landfill for disposal. Non-oily wastes from onshore operations including incinerator ash will be trucked directly to the Valdez landfill for disposal. No oily wastes will be disposed in this landfill.

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TRANSPORTATION OF OILY WASTES

Oily solid wastes from offshore operations will be placed in plastic bags to minimize pollution and facilitate transportation and storage. The bags will be placed above the high tide line of the beach being cleaned while awaiting pickup.

For wastes generated in Prince William Sound, two deck barges of approximately 70-75 feet by 250 feet will each be equipped with 80 to 90 aluminum containers each measuring approximately 12'6" x 8' x 6'6" deep. Lids will be provided to keep rainwater out. These containers were cleaned and tested for liquid tightness prior to use. Landing craft vessels will carry the empty containers into the shoreline areas to be filled with bagged materials and then returned to the storage barges. Additional landing craft will be used to haul the full containers to the offshore burner barge or to the onshore incinerators at Valdez and Whittier.

Oily wastes generated from onshore activities in the Valdez area such as boat and equipment washing and maintenance will be transported by dump trucks which will be lined to contain any leakage.

Wastes generated in Seward, Homer, Seldovia, Kodiak, or other areas outside Prince William Sound will be transported by landing craft or other vessels to temporary storage sites at the nearest community as described below. The wastes will then be transported in containers to Anchorage or Valdez for consolidation with other oily wastes. Alternatively, they may be transported to Anchorage or Prudhoe Bay for incineration.

STORAGE OF OILY SOLID WASTES

Oily solid wastes will be temporarily stored at the following locations to accommodate fluctuations in waste generation rates and improve efficiency of the overall cleanup, transportation and disposal operations. If the assessment indicates significant levels of contamination, the site will not be used.

Valdez Area

Two sites have been designated within the Alyeska Valdez terminal for the temporary storage of oily solids. One is a concrete pad approximately 75 feet by 100 feet which is adjacent to and drains into the sludge pit. The other is part of a lined and diked area (total size about 80 feet by 170 feet) used for fire training purposes. Security for these sites will be provided by Alyeska's current security procedures.

Exxon has applied to the DEC for permission to construct a third temporary storage area and to install three incinerators at either of two sites. A lined pit of about 120 feet by 350 feet is proposed. Exxon originally proposed using an existing pit near the City of Valdez Sewage Treatment plant. The DEC requested this facility be sited at the Alyeska Terminal. A site located outside Alyeska's security area to the east of Allison Creek but still on Alyeska property was identified as an acceptable site to the DEC, Alyeska, and Exxon as long as permitting could be accomplished.

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Prince William Sound Storage

Primary offshore storage of oily materials in the Prince William Sound area will be on the two deck/container barges discussed earlier. The containers on these barges are impermeable and lids are provided to prevent rainwater intrusion and collection.

The need for additional storage is under review. Such storage will tie into offshore incineration plans, details of which are being developed. Wood chip storage/transport barges are available for immediate transport to the Valdez area. The storage boxes on these barges would be made impermeable via lining or welding.

Areas outside Prince William Sound

Oily wastes from cleanup activities in Seward, Homer, Seldovia, Kodiak or other areas outside Prince William Sound will be stored at onshore locations in containers when available. If the quantities of wastes generated in these areas becomes too large to be handled in this fashion, larger storage sites will be developed by constructing lined pits to provide adequate secondary containment. Specific storage locations will be developed as needed in concert with the DEC and local authorities. Site specific management plans for these areas will include locations, containment methods, liner specifications and operating plans.

DISPOSAL SITES AND FACILITIES

City of Whittier

The existing incinerator at the City of Whittier has been renovated by Exxon to dispose of oily solid wastes. The unit has been tested with representative samples of oily wastes and found to meet state requirements (20% opacity) at feed rates of 600 pounds/hour. Oily wastes at Whittier will be stored in shipping containers to provide secondary secondary containment. Bags may be temporarily placed on a lined area while being fed to the incinerator.

The ground surface in the vicinity of the Whittier incinerator is visibly contaminated from prior activities. An environmental assessment of the area is being performed to establish baseline contamination levels and documentation of prior activities. If the assessment indicates significant levels of contamination, the site will not be used.

Valdez Areas

As discussed under Storage Areas, Exxon has applied to the DEC for permission to install three small hospital type incinerators at one of two sites in the Valdez area, either at a site near the Sewage Treatment Plant or at a site on Alyeska property to the east of Allison Creek. These incinerators have rated capacities of about 500, 600, and 900 pounds/hour. These units will be used to dispose of contaminated materials temporarily stored at this site and the Alyeska terminal.

The Alyeska terminal incinerator is being used to dispose of small quantities of oily solid wastes (approximately 300 pounds/hour). This hospital type incinerator will also be used to dispose of animal carcasses pending installation and startup of the other incinerators at the Valdez area site. Such incineration will only occur upon the approval of the DEC and U. S. Fish & Wildlife Service.

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Burner Barge (Offshore Silo Incinerator)

A large silo type burner (Figure 5) mounted on a 312 foot by 68 foot deck barge will provide offshore disposal of wastes. This unit is anticipated to incinerate between three and seven tons per hour of contaminated materials. It will include a hydraulic log loader and chipper that will allow direct processing and disposal of large items such as oiled driftwood or logs. The burner will be equipped with a bag house to control particulate emissions. Tug assist will be provided to facilitate moving the barge as required to facilitate transportation and disposal of the recovered solid wastes. A second barge may be anchored adjacent to the burner barge to facilitate handling and provide temporary storage of wastes. Also a vessel will be needed to house the crew since the burner barge is not U. S. Coast Guard certified for accommodations.

Disposal of ash from the unit is still being evaluated and may depend on the type of cooling system provided for the ash hopper. Indirect cooling is planned for use and the ash should be suitable for disposal in the City of Valdez landfill. If the salt water spray method is used, the ash will contain large amounts of salt and appropriate disposal methods will need to be determined.

Landfills

Disposal of oily solids at landfills is a proven method which will also be used to dispose of oily solid wastes. Preliminary evaluations are being made to determine feasible locations, permitting requirements, etc. Landfilling offers a great deal of flexibility to accommodate varying waste generation rates and varying waste characteristics. The collection and transportation systems are largely in place and can be implemented quickly.

Rotary Kiln Incinerator

Rotary kiln incinerators are also being evaluated for additional capacity to dispose of oiled debris. These could also handle contaminated soil, if required.

Waste Disposal for Areas outside Prince William Sound

Waste disposal for small quantities of oily wastes generated at the communities of Seward, Homer, Seldovia, Kodiak or at other areas outside Prince William Sound will generally be handled by transporting the wastes to the planned storage and disposal sites in Prince William Sound. If sufficient quantities of wastes are generated or accumulated in the area, incinerators may be moved from the Valdez area site (s) or additional incinerators acquired to provide onsite disposal capability. Additional capability is provided by the landfill option discussed above and by existing incinerators at Anchorage and Prudhoe Bay. At the current time, volumes accumulated at these sites are very small.

Figure 6 provides an estimate of the timing of incinerator startup and availability.

PERMITTING REQUIREMENTS

In his April 17, 1989, approval of the EXXON Shoreline Cleanup Execution Plan, Vice Admiral Robbins as the Federal On Scene Coordinator recognized the importance of timely permitting and advised he would "ensure that applicable permits are

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expeditiously processed so as to not interfere with an appropriate and concerted cleanup effort."

Valdez Area Site

Although formal DEC permits are not required because the rated capacities of the incinerators are below the permitting threshold and the DEC doesn't require permits for temporary solid wastes storage sites, DEC has advised Exxon that DEC approval of all cleanup activities is required, independent of other regulatory requirements. As discussed previously, Exxon has requested the DEC to approve one of two storage and incineration sites in the Valdez area, either a site near the Sewage Treatment Plant or on Alyeska. Both Exxon and Alyeska prefer the site near the Sewage Treatment Plant but are willing to use the Alyeska site, as requested by the DEC, provided Exxon's facility be treated as a "stand-alone" facility for permitting purposes and that Exxon's installation will not require the modification of any of Alyeska's permits nor will Alyeska be required to apply for new permits. At this time, a decision has not been made by the DEC.

Whittier Incinerator

DEC air quality control permits will not be required for the Whittier incinerator because it will be operated at a lower capacity than the minimum required permitting threshold (2000-pounds/hour). The DEC has been requested to review the operating plan and to issue a letter of approval or concurrence of the operation. Full scale operations at this site will await the results of the environmental evaluation of prior contamination near the incinerator site.

Burner Barge/Storage Barge

The burner barge will require an air quality control permit from the DEC.

Landfilling

Landfilling is planned to be employed in the Lower 48 states rather than in Alaska. In this case, in-state permitting would not be required to implement this option.

Seward, Homer, Seldovia and Kodiak Storage Areas

As with the Valdez area storage and incineration sites, DEC permits are not expected to be required. DEC review of the specific storage sites using the methods described herein will be obtained as need for the sites arises.

Table 1

VALDEZ OIL SPILL**WASTE SUMMARY**

<u>SOLIDS:</u>	<u>TOTAL ESTIMATED TONS</u>
LARGE: * HEAVY OILED LOGS	250
* SORBENT BOOMS	3,650
SMALL SIZE: * OILY SORBENT PADS/ RAGS/CLOTHES	3,150
* EXPIRED ANIMALS	20
SUB TOTAL:	7,070
 <u>LIQUIDS:</u>	
* CLEAN, SEPARATED OIL	9,800
* "TRASH" CONTAMINATED OIL	4,800
* WASTEWATERS:	
- SKIMMED, SHORELINE AND OFFSHORE	35,000
- WASHING OPERATIONS	2,100
- PIT DRAINAGE	5,600
SUB TOTAL:	57,300
 <u>SEMI LIQUID/SOLIDS:</u>	
* HEAVILY OILED KELP	N.A.
* MOUSSE / SLUDGE	N.A.
* TARRY MATS	900

Figure 1

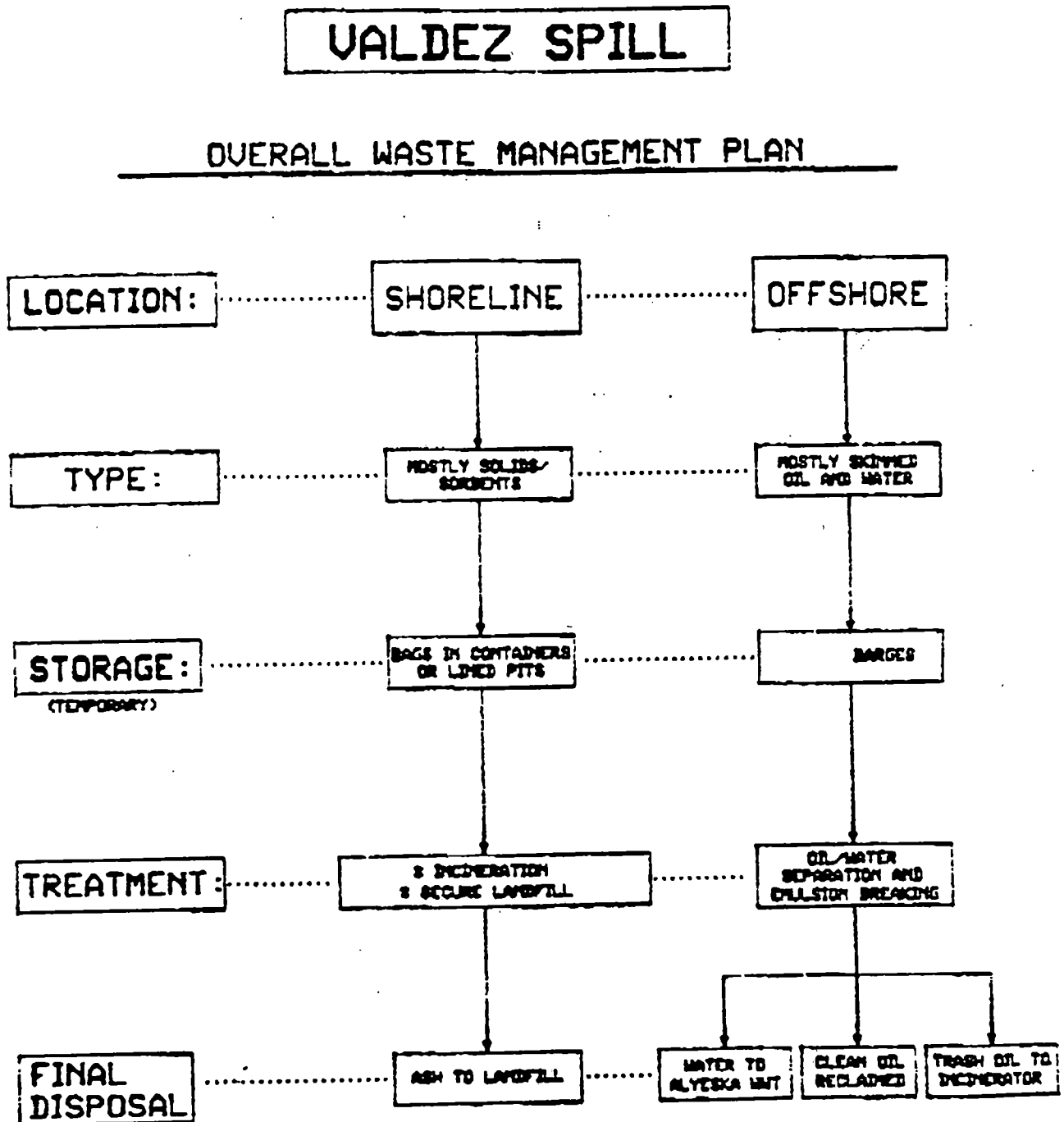
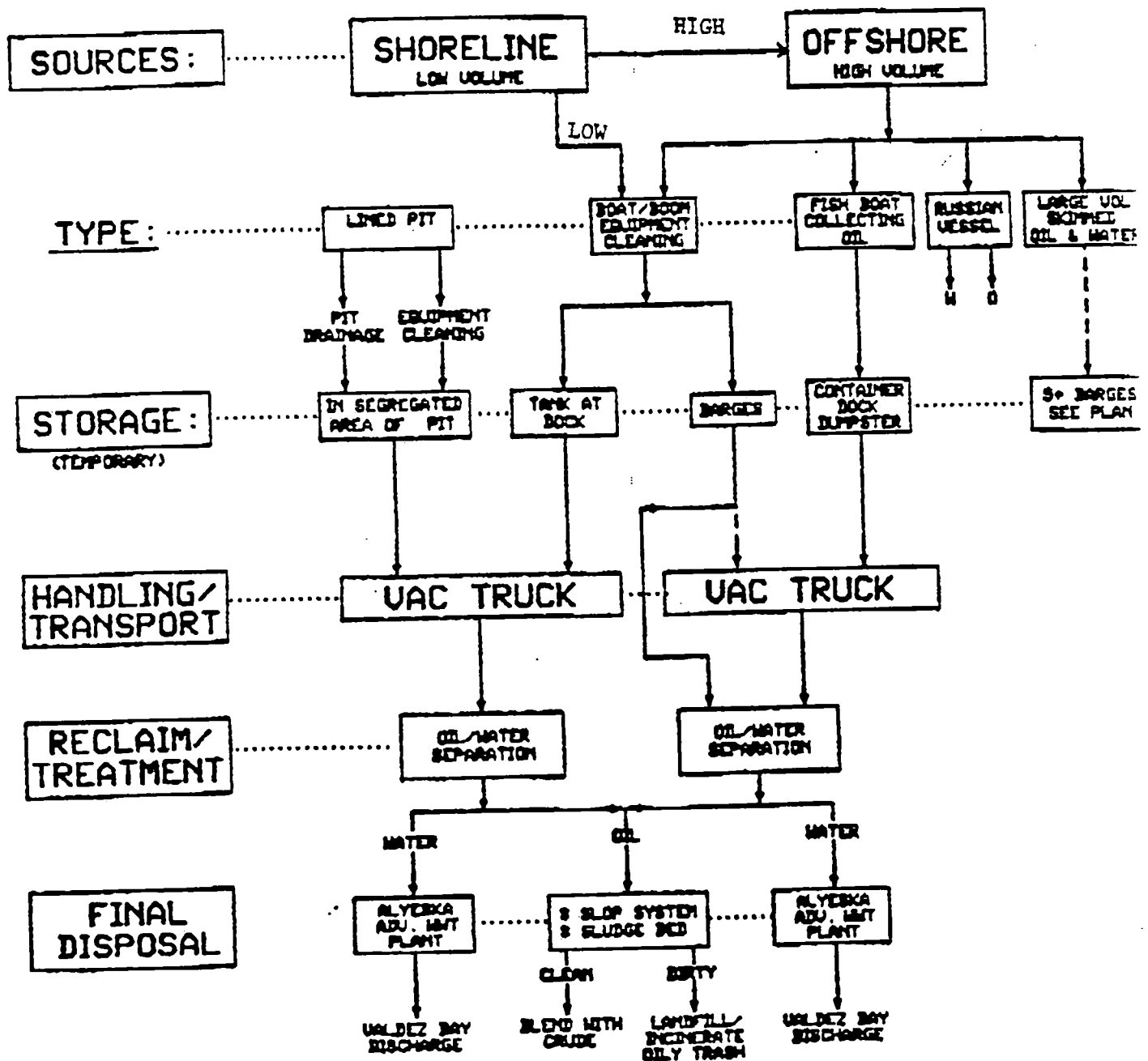
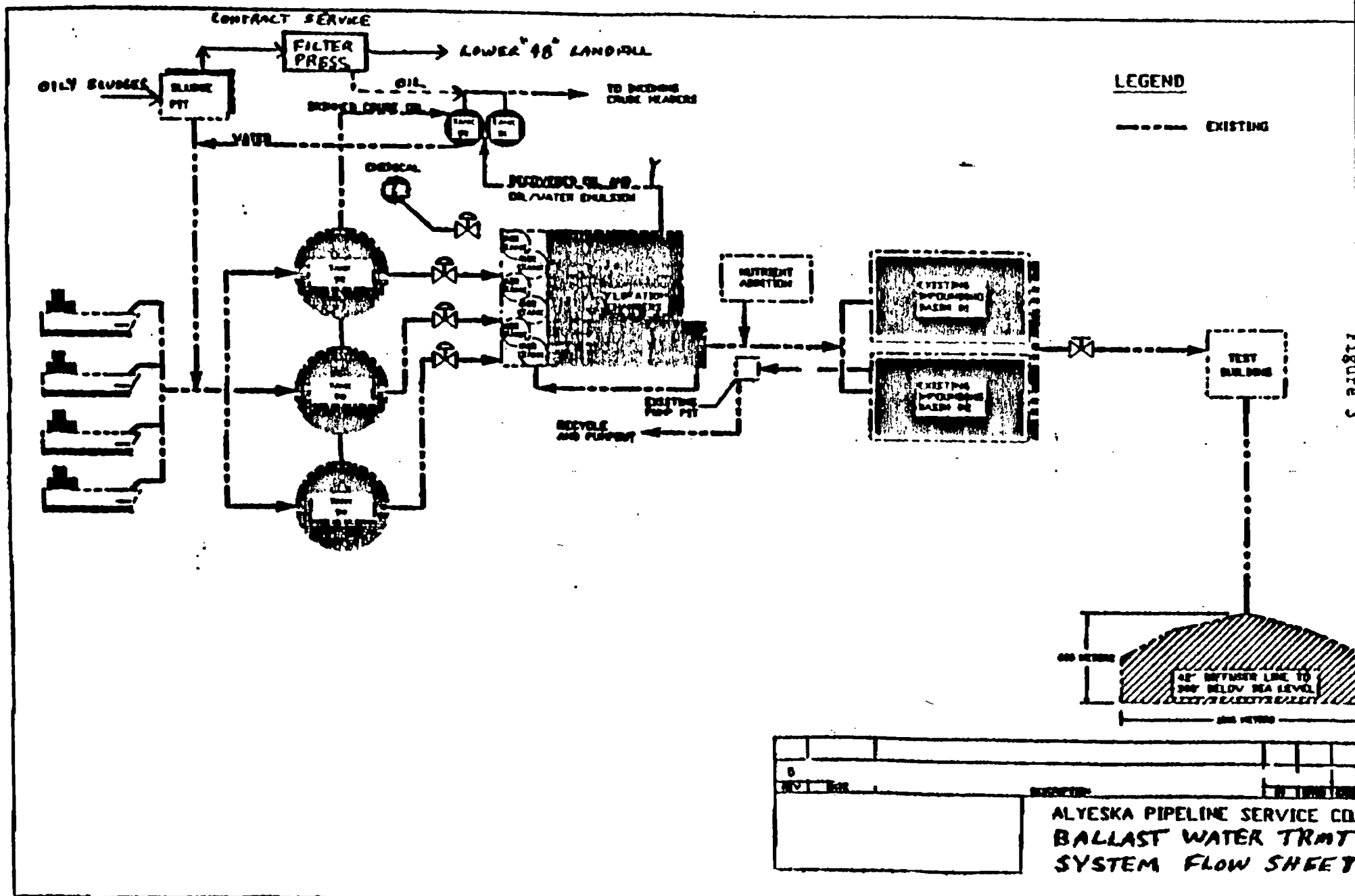


Figure 2

VALDEZ SPILL

LIQUID WASTE STORAGE/DISPOSAL PLAN





VALDEZ SPILL

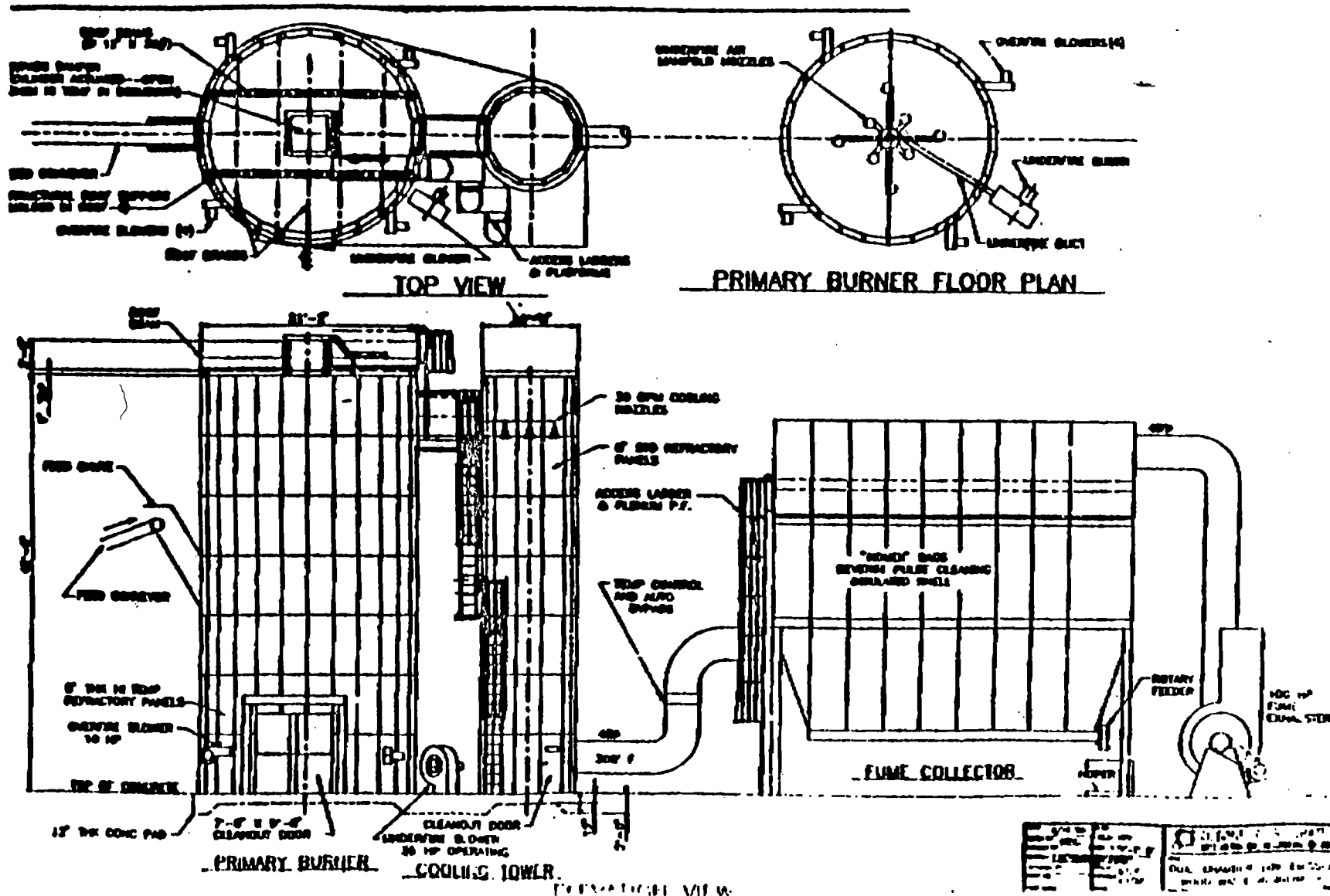
```
graph TD
    SOURCE[SOURCES] --- SHORELINE[SHORELINE]
    SOURCE --- OFFSHORE[OFFSHORE]
    SHORELINE --> TYPE[TYPE]
    TYPE --> NON_OILY_TRASH[NON-OILY TRASH]
    TYPE --> EXPIRED_FOOD[EXPIRED FOODS/ANIMALS]
    TYPE --> OIL_LOGS[OILY LOGS, DRIFTWOOD]
    TYPE --> SORBENT_BOOMS[SORBENT BOOMS, PADS & SWAPS IN BAGS]
    TYPE --> OILY_KELP[OILY KELP MATS IN BAGS]
    TYPE --> NON_REUSABLE_BOOMS[NON REUSABLE BOOMS]
    NON_OILY_TRASH --> STORAGE[STORAGE: (TEMPORARY)]
    STORAGE --> SEGREGATED[SEGREGATED NON-OILY BAGS]
    SEGREGATED --> FINAL[FINAL TREATMENT & DISPOSAL]
    EXPIRED_FOOD --> USFWS[USFWS FACILITIES]
    USFWS --> HOSPITAL[HOSPITAL BATES INCINERATORS]
    HOSPITAL --> S_INCINERATORS[S INCINERATORS  
-WHITTIER (1)  
-VALDEZ (3)  
-ALYERKA (1)]
    OIL_LOGS --> CONTROL[CONTROL IN PLACE]
    CONTROL --> S_INCINERATORS
    SORBENT_BOOMS --> CONTAINERS[STORED IN CONTAINERS OR LINED PITS]
    CONTAINERS --> S_INCINERATORS
    CONTAINERS --> BURNABLE[BURNABLE]
    BURNABLE --> LARGE_INCINERATOR[LARGE INCINERATOR BARGE]
    OILY_KELP --> CONTAINERS
    NON_REUSABLE_BOOMS --> CONTROLLED[CONTROLLED IN PLACE]
    CONTROLLED --> LARGE_INCINERATOR
    CONTROLLED --> NON_BURNABLE[NON BURNABLE]
    NON_BURNABLE --> CLEANED[CLEANED]
    CLEANED --> LARGE_INCINERATOR
    LARGE_INCINERATOR --> VALDEZ((VALDEZ OR OTHER PUBLIC LANDFILL))
    S_INCINERATORS --> VALDEZ
```

The flowchart illustrates the process of handling oil spill materials. It begins with 'SOURCES' branching into 'SHORELINE' and 'OFFSHORE'. 'SHORELINE' leads to 'TYPE', which categorizes materials into 'NON-OILY TRASH', 'EXPIRED FOODS/ANIMALS', 'OILY LOGS, DRIFTWOOD', 'SORBENT BOOMS, PADS & SWAPS IN BAGS', 'OILY KELP MATS IN BAGS', and 'NON REUSABLE BOOMS'. 'NON-OILY TRASH' is sent to 'STORAGE: (TEMPORARY)' and then to 'SEGREGATED NON-OILY BAGS', which leads to 'FINAL TREATMENT & DISPOSAL'. 'EXPIRED FOODS/ANIMALS' are sent to 'USFWS FACILITIES', then to 'HOSPITAL BATES INCINERATORS', and finally to 'S INCINERATORS' (Whittier, Valdez, Alyerka). 'OILY LOGS, DRIFTWOOD' are 'CONTROL IN PLACE' and sent to 'S INCINERATORS'. 'SORBENT BOOMS, PADS & SWAPS IN BAGS' and 'OILY KELP MATS IN BAGS' are 'STORED IN CONTAINERS OR LINED PITS'. From here, 'BURNABLE' materials go to a 'LARGE INCINERATOR BARGE', while 'NON BURNABLE' materials are 'CLEANED' and then sent to the 'LARGE INCINERATOR BARGE'. 'NON REUSABLE BOOMS' are 'CONTROLLED IN PLACE' and sent to the 'LARGE INCINERATOR BARGE'. Finally, both the 'S INCINERATORS' and the 'LARGE INCINERATOR BARGE' lead to 'VALDEZ OR OTHER PUBLIC LANDFILL'.

8 SHOWS PRIMARY DISPOSAL METHOD - INCINERATION;
LANDFILLING ALTERNATIVE NOT SHOWN.

Figure 5

Description of Burner Barge



* TIME LINE FOR INCINERATION OF OIL SPILL SOLID WASTES

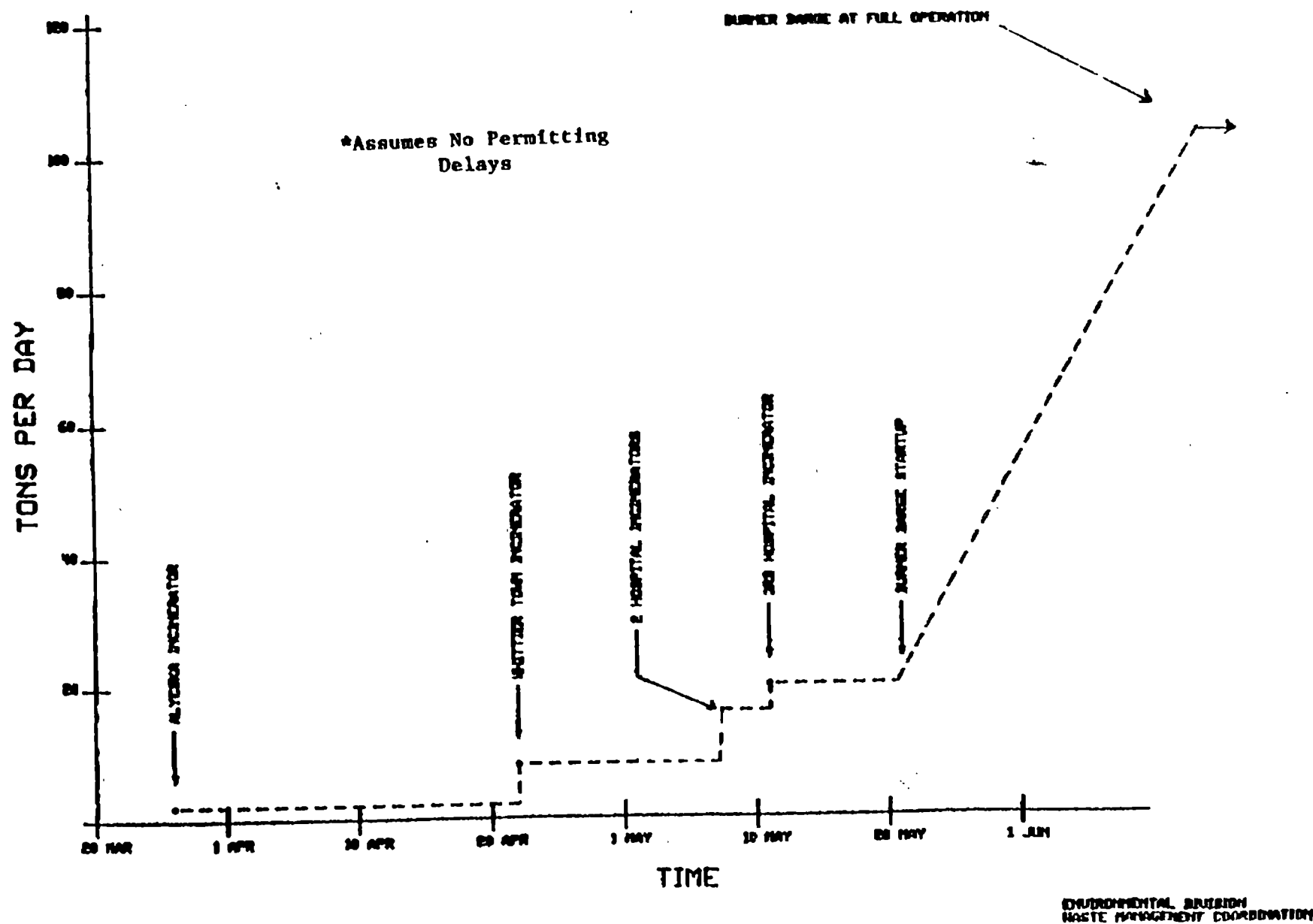


Figure 6

Shoreline Restoration Program Planning

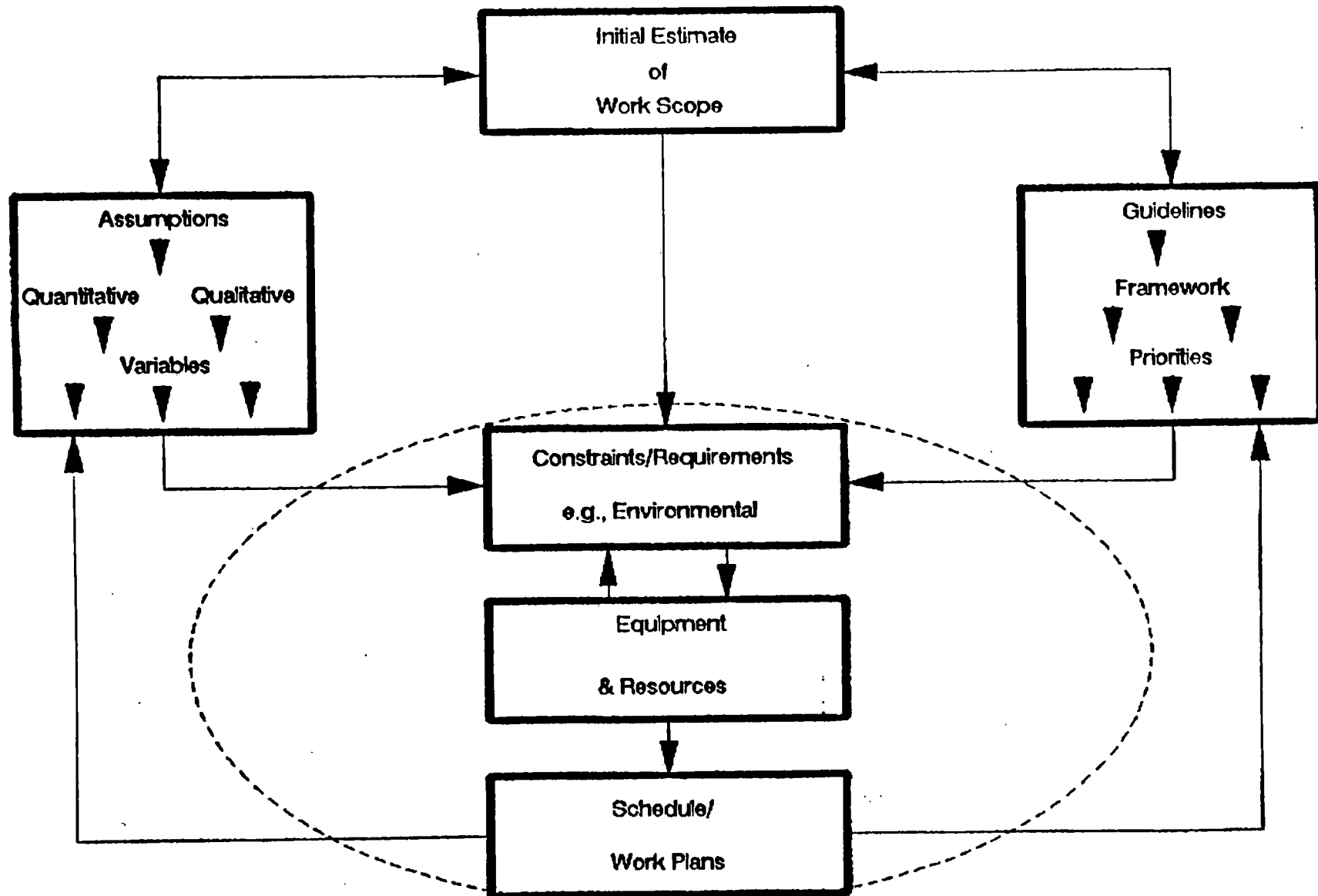
Methodology

Assumptions/Strategy

Schedule Overview

May 1, 1989

Planning Methodology



Shoreline Restoration Effort

Guidelines

- Execute the work in a safe fashion
- Complete the restoration as soon as possible
- Restore affected areas with minimum environmental impact
- Minimize adverse socio-economic impact to the community
- Be operationally sound

Assumptions

- Timely approval/sign-offs for shore restoration
- Scope defined by April 21 ADEC mapping & initial aerial surveys in the Gulf of Alaska
- Acceptable level of cleaning defined by maximum of three passes with low pressure/cold water
- Production rates as defined in April 15 plan based on limited experience

Constraints

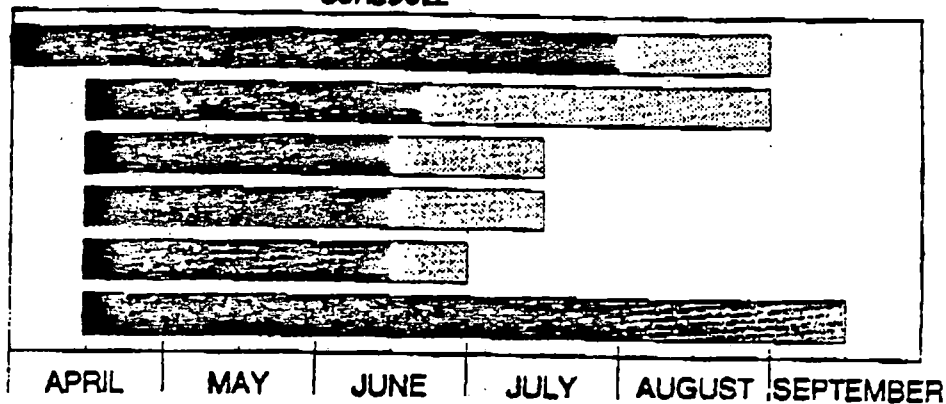
- Environmental/archeological considerations
- Weather/short time period for cleaning
- Productivity
- Fleet service factor
- Logistics

Equipment/Resources

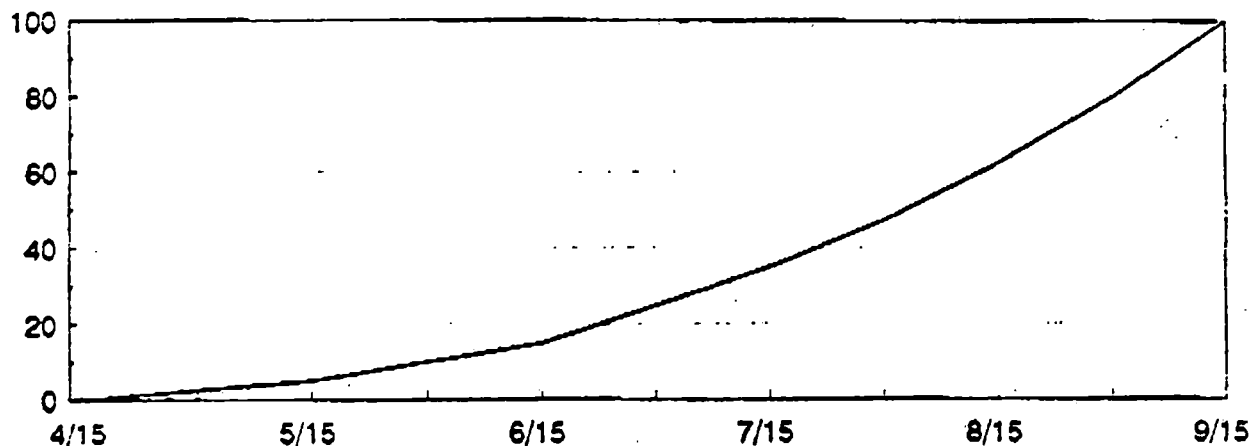
- Barge fleet includes:
 - +Effective 33 LCV's
 - +Effective 13 Maxi Barges
- Personnel requirements include:
 - +Overall peak of approximately 3400
 - +About 1475 people on beach restoration
 - +Rotation basis two weeks on/one week off

SHORELINE RESTORATION SCHEDULE

SCOPING
PLANNING
DESIGN
PROCUREMENT
MOBILIZATION
SHORELINE RESTORATION

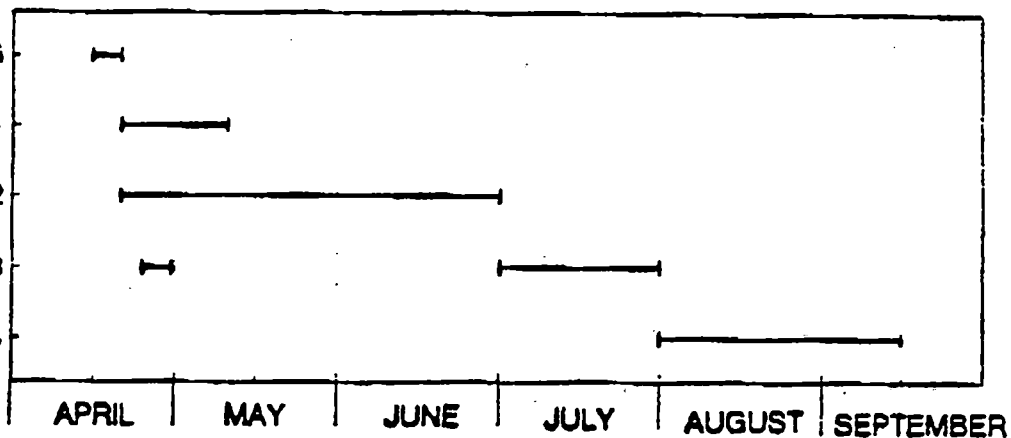


PERCENT COMPLETE



TESTING/TRAINING

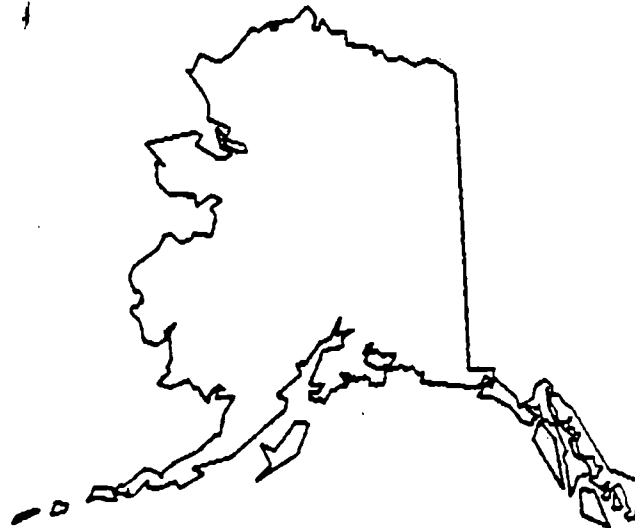
PRIORITY 1
PRIORITY 2
PRIORITY 3
PRIORITY 4



- Priority 1 (pinniped haulouts) to be completed May 10.
- Some Priority 2 and 3 areas cleaned in conjunction with Priority 1 to eliminate potential for recontamination from adjacent segments.
- Within Priorities 2 and 3, more environmentally sensitive segments to be worked first.

EXXON

SHORELINE RESTORATION PLAN



May 1, 1989

SHORELINE RESTORATION PLAN

TABLE OF CONTENTS

I	-	ENVIRONMENTAL/ECOLOGICAL GUIDELINES
II	-	PERSONNEL
III	-	EQUIPMENT
IV	-	TELECOMMUNICATIONS
V	-	ASSUMPTIONS
VI	-	RESTORATION STRATEGY
VII	-	MAPPING
VIII	-	SCHEDULE

I. - ENVIRONMENTAL/ECOLOGICAL GUIDELINES

SUMMARY

This section documents agreed mechanisms for establishing priorities for restoration of the shoreline affected by the oil spill. For the most part they are extracted from guidelines issued by the Joint Shoreline Committee April 7, 1989. The Cleanup Priority Assessment Team will continue to discuss priorities at the evening science meeting and recommend changes as more information becomes available. The meeting will continue to serve as the means for communication of the priority areas to Exxon.

Maps have been prepared to provide the natural resource information needed to set priorities for shoreline restoration. These maps have been developed to highlight the most sensitive natural resources during the spring and summer in Prince William Sound. It is intended that these maps will be updated with input from all agencies responsible for natural resources affected by the spill. Specific sensitivities referred to on these maps are as follows.

AREAS OF SENSITIVITY

● Anadromous Fish Streams

The streams designated are those which produce at least 60 % of the fish for each district. Both the stream and adjacent estuarine areas, where the outmigrating pink salmon fry concentrate in the shallow water, are shown. No clean-up should be conducted in these areas.

● Herring Spawning

Priority areas have been selected based on productivity, using input from the last few years' surveys. Herring spawning began in late March and should peak the last week in April. Herring spawn primarily on the near shore kelp and eelgrass. Current reports on the herring spawn are most encouraging.

● Hatcheries

Three hatcheries in western PWS.

- Pink Salmon Fry Remote Release Areas

Placement of pink salmon fry in salt water pens in Boulder Bay has already been completed. The release to the bay has begun. Plankton growth and water quality data is supportive.

- Commercial Fishing Areas

The following commercial fishing areas have been identified as high priority: 1) concentrated purse seine/gill net areas where fishermen deploy nets close to shore, and 2) purse seine hook-offs, which include both individual points and areas of numerous points.

- Marine Mammal Haulout and Pupping Areas

Only the large colonies of sea lions and harbor seals are identified. These areas usually coincide with major pupping areas, with pupping occurring from late May to June. Cleaning of these areas should be completed by mid-May. There should be no clean-up activities in these areas during the pupping season.

- Waterfowl Concentration Areas

Four major waterfowl staging areas are identified: Cabin Bay, Gibbon Anchorage, Point Chalmers, and Stockdale Harbor. Large numbers of migrating waterfowl pass through Prince William Sound in April. For Shorebirds, no particular areas of concentrated use have been identified. It turns out that the Marine Mammal haulout and pupping areas coincide with the stopping points for migrating water fowl. Restoration of the Priority Class 1 areas meets both needs.

- State Marine Parks

Two state marine parks are identified: Horseshoe Bay on Latouche Passage and the southern end of Esther Island.

- Recreational Areas/Forest Service Cabins

High-use recreational tent sites and anchorages are identified. USDA National Forest Service cabins are also included. Their value as a social resource necessitates their inclusion.

- Privately Developed Lands/Facilities

These areas include private residences, both seasonal and year-round, and resource production including timber and tourism.

- Research Natural Areas

The U.S.D.A. National Forest Service is developing a designated Research Natural Area consisting of the southern two-thirds of Green Island, from shore to shore. Other areas may be designated in the future, particularly those requiring monitoring for recovery without clean-up.

- High Subsistence Value Areas

These areas are heavily used by native villages for subsistence fishing and hunting. There are also mink and otter trapping trails along the shoreline in these areas.

- Seabird Nesting Colonies

Major seabird nesting colonies are designated as high priority for protection.

OVERALL RECOMMENDATIONS

Areas which would be harmed by the presence and actions of clean-up crews have been pinpointed. These areas are sensitive to the extent that the presence and actions of clean-up crews MAY HAVE MORE DETRIMENTAL EFFECTS THAN THE PRESENCE OF OIL. In order to minimize shoreline damage resulting from restoration activities, it is strongly recommended that members of appropriate resource agencies be contacted PRIOR to remedial activities of the areas listed below. This list of areas is subject to change as more information is made available:

- Southwest corner of Eleochar Island
- North side of Smith Island
- Southern 2/3 of Green Island
- All marshes and tidal flat areas
- Anadromous fish streams
- no clean-up in intertidal areas

Areas of highest concern have been identified and are documented in this plan.

Exxon is coordinating a program to recover oiled birds and sea otters. This will keep predation of dead animals to a minimum and aid in establishing the number of animals impacted by the spill.

WILDLIFE CONSERVATION CONSIDERATIONS

April 22, 1989 memorandum State of Alaska Dept. of Fish & Game.

QUOTE:

Since the Exxon Valdez oil spill, personnel from the Division of Wildlife Conservation and the National Marine Fisheries Service have been in Prince William Sound evaluating impacts of the spill on harbor seals and Stellar sea lions. Part of the work has involved looking at the degree of oiling on various known haulouts and how that may be affecting haulout utilization. One goal of this effort was to identify and prioritize areas for clean-up.

It is essential that oil clean-up activities on and near pinniped haulouts be conducted properly. Human activities near the haulouts are likely to prevent seals and sea lions from using them, which may further stress animals that have already been impacted by the spill. Research will be conducted to evaluate impacts and disturbances caused by clean-up activities since these may affect our ability to accurately document post-spill haulout utilization patterns.

Recommendations for clean-up operations on and near pinniped haulouts in Prince William Sound are as follows:

Stellar sea lions

Sea lion haulouts are located on Glacier Island, Perry Island, Point Eleanor, the Pleides, the Needle, and Point Elrington. Some of these sites are within the main area impacted by the spill. On-site inspections conducted through 9 April indicated that, with the exception of Point Eleanor, hauling areas were not oiled. At this point the clean-up of these sea lion haulouts is not highest priority.

Harbor seals

Harbor seals haul out at dozens of locations in Prince William Sound. We have focused our impact assessment on haulouts in the eastern half of the Sound that have been included in trend counts and surveys conducted in recent years. Within this area haulout sites impacted by oil occur in the group of islands and rocks extending from Storey Island to Green Island. We have conducted several on-site inspections of these areas during the period 29 March-21 April. Oil was found on haulout sites at Storey Island, Agnes Island, Little Smith Island, Big Smith Island, Seal Island, Applegate Rocks, and Green Island. Based on the degree of oiling of these areas and our impression of their importance to seals, particularly during the pupping and molting season, we recommend the following priority for clean-up:

Attachment 1

Wildlife Sensitivities During Restoration Operations

Resource	April	May	June	July	August	September
Pink Salmon	No clean-up operations will occur in the intertidal areas of anadromous streams.					
Pinnipeds	(4/7)	(5/10)		(7/1)	(8/10)	(8/21)
Waterfowl		(5/1)				
Herring		(5/20)				

Shaded time periods () indicate when restoration can occur in regions which various oil sensitive species inhabit during spring and summer.

II. - PERSONNEL

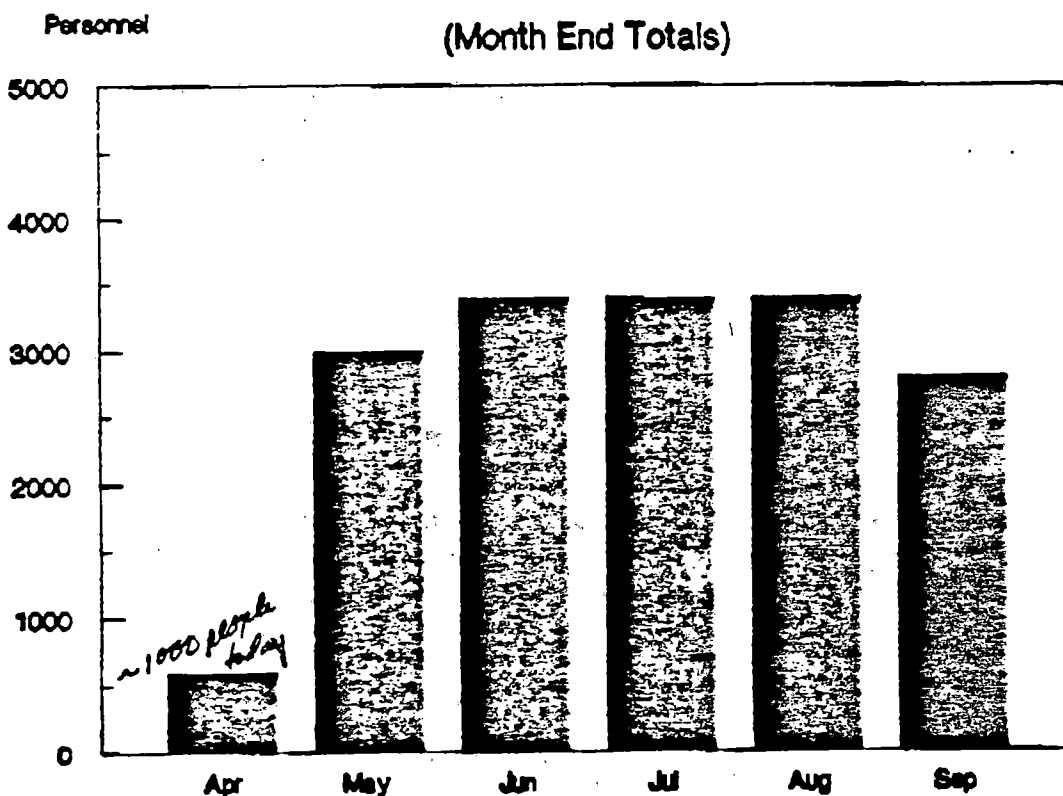
Manpower response, in terms of job applicants, has been very positive. Assimilation of field labor to the restoration effort has, so far, been good, even with the accelerated mobilizations of the past week. Exxon has accelerated the arrival of highly qualified supervisors to aid in this process. Early efforts have included insuring that all personnel are properly trained with regards to safety, environmental and operational requirements.

The personnel requirements outlined in our April 15 Plan, assumed a rotation based work force with fourteen days working and fourteen days off, for workers directly involved in restoration efforts. We have re-evaluated this basis and will employ a work schedule of fourteen days on and seven days off. This, together with the modest increase in our planned effective deployment of LCV's and Maxibarges results in a greater proportion of total personnel being located offshore. We are confident that the new work schedule will result in a more efficient utilization of resources and will minimize attrition. This initiative has been implemented for all contractor field personnel. The new forecast personnel requirements are attached. This forecast results in approximately 1475 people directly on the beach restoration during peak periods.

Shoreline Restoration Execution Plan

*m/v Columbus - 60 people
leave 5/1*

Estimated Total Personnel (Month End Totals)



Changed Items from April 15 Plan

- Early mobilization of LCV's and Maxi Barges
- Accelerated personnel build-up
- Changed Rotation Schedule
- The work force shown above will support shoreline efforts during peak periods but does not include those involved in tar ball pick-up and near shore oil recovery in the areas outside of Prince William Sound

4/29/89

MILITARY SUPPORT

On April 24, 1989 the USS JUNEAU (LPD 10) arrived in Valdez Alaska to provide additional resources in the form of berthing space aboard the ship for 400 workers and staff, plus 9 landing craft. Six of these landing craft were equipped with pumps and other beach cleaning equipment, the remaining three augmented the support vessels fleet. These resources were provided to assist in the operation of restoring the Prince William Sound shoreline impacted by the oil spilled from the Exxon Valdez. These resources were deployed to begin cleaning the north shoreline on Smith Island. This Island is an environmentally sensitive area used by pinniped seals for having their pups in early May, as described in the environmental part of this plan.

The USS FORT MCHENRY (LSD 43) is scheduled to arrive on the scene the first week of May, providing nine additional landing craft. Six of these craft are planned to be equipped with shoreline cleaning equipment. Use of the USS MCHENRY has not yet been determined.

The availability of these Naval resources as supplements to Exxon's early mobilization of resources, has given added momentum to the mobilization of the restoration operations.

Naval and U.S. Coast Guard personnel have been most cooperative in this process, and their help is sincerely appreciated.

The Air Force "OSCAR" system will also support the shoreline restoration effort.

III. - EQUIPMENT

OVERVIEW

In the days following release of the April 15 plan, we have established that the equipment, men and materials can be mobilized to meet plan requirements, and have demonstrated that the equipment will work.

Mobilization of manpower and equipment has been significantly accelerated, to provide additional flexibility to the plan. The current level of mobilization has been aided by adding the USS JUNEAU to the fleet. Exxon has also requested that the USS FORT MCHENRY be made available. While MCHENRY usage has not been determined, it provides reserve capacity in the overall resource equation.

Accelerated mobilization is well established and underway, and is incorporated as a firm feature, rather than just an assumption.

We are continuing to evaluate alternatives for enhanced production rates for the equipment involved. We expect to receive field data that will allow us to significantly refine the planning and scheduling models.

In addition to resources specifically identified in this plan, additional equipment and manpower have been employed to accelerate shoreline restoration in areas of the Kenai peninsula. A large amount of equipment has been deployed to collect near shore oil/mousse accumulation in the Elizabeth Island to Port Dick area by capturing the accumulations with booms and removing by skimmer or mechanical means.

Response teams were also deployed rapidly and successfully to clean reportedly oiled beaches in the Seward and Port Graham areas. Clean-up was accomplished by hand removal of oily debris. Coast Guard approval has been obtained to allow these rapid deployment and restoration techniques to continue. These resources are not included but will supplement restoration activities in the plan.

RESTORATION TECHNIQUES AND ALTERNATIVESDESIGN BASIS/METHODS/EQUIPMENT● LCV's (Cold Flush/Warm Water Wash)

LCV's are used for high volume cold water wash with localized high pressure warm water cleaning capability. The LCV typical cleaning technique/method is as follows:

- Deploy containment boom
- Deploy flushing header to beach
- Supply header from two 800 gpm and one 1000 gpm pumps
- Connect eight 2" hand hoses to special manifold on 1000 gpm pump
- Deploy high pressure hot water washers to beach
- Deploy 2" pumps and hand hoses to beach
- Deploy skimmers

Each section of beach will be flushed to the low water mark. All solid, oily material will be loaded into approved containers. Each section will be approved by the F.O.S.C. on-site representative prior to moving on to the next section.

● Oil Recovery Barge System (Maxibarge)

The Maxibarge system is a larger version of the LCV system, with the capability to place a greater volume of warm and cold water onto the beach through higher output pumps and two package boiler / heat exchanger packages. The typical Maxibarge cleaning technique/method is as follows:

- Deploy containment boom
- Deploy cold water header to beach from support vessels
- Extend manlift boom, supply hot water to beach with deluge and hand hose capacity
- Deploy skimmers

Each section of beach will be flushed to the low water mark. All solid, oily material will be loaded into approved containers. Each section will be approved by the F.O.S.C. on-site representative prior to moving on to the next section.

● Vessel Diagrams/Equipment Lists/ManpowerTypical LCV Equipment Spread (See Diagram A)

- | | |
|--------------------------------|----------------------------------|
| * 40 ft. Landing Craft Vessel | * 2 - 1000 gpm pumps |
| * 2 Work Boats; Crew Boat | * 2 - 800 gpm pumps |
| * Shared Berthing Ship | * 2 - 2000 psi hot water washers |
| * 1000 ft. boom | * 250 ft. 6" header hose |
| * 2 Skimmers | * 2 5kw generators |
| * 400 ft. hose (various sizes) | * 2-175 gpm pumps |

Typical Oil Recovery Barge System (Maxibarge) (See Diagram B)

- * Barge (40' x 120' approx.)
- * 1 Tugboat
- * 2 Work skiffs
- * 2 Small boats for boom deployment and cold water pumping
- * Shared/dedicated berthing and crew boats
- * 6000 ft. 8" boom
- * 5000 ft. 18" boom
- * 1 heavy oil skimmer - 200 gpm
- * 1 light oil skimmer - 75 gpm
- * 1 20 Ton crane
- * 1 225kw generator w/switchgear
- * 2 75 gpm Diesel fired water heaters (4.3M BTU/hr) w/makeup system
- * 1 3600 gal diesel tank and 1 250 gal gasoline tank
- * 2 Warm water transfer (pressure) pumps 75 gpm @ 250 psi
- * 1 Feed water pump (to heaters) 150 gpm @ 100 psi
- * 1 Oil transfer pumps - 725 gpm @ 50 psi
- * 2 - 1500 gpm @ 50 psi cold water pumps
- * 8 - 250 gpm @ 25 psi cold water pumps
- * Crew trailer
- * 500 ft. 6" header hose
- * 2000 ft. hose (various sizes)
- * Manlift/Articulated Arm

40' LCV FLUSH/FLOAT SYSTEM

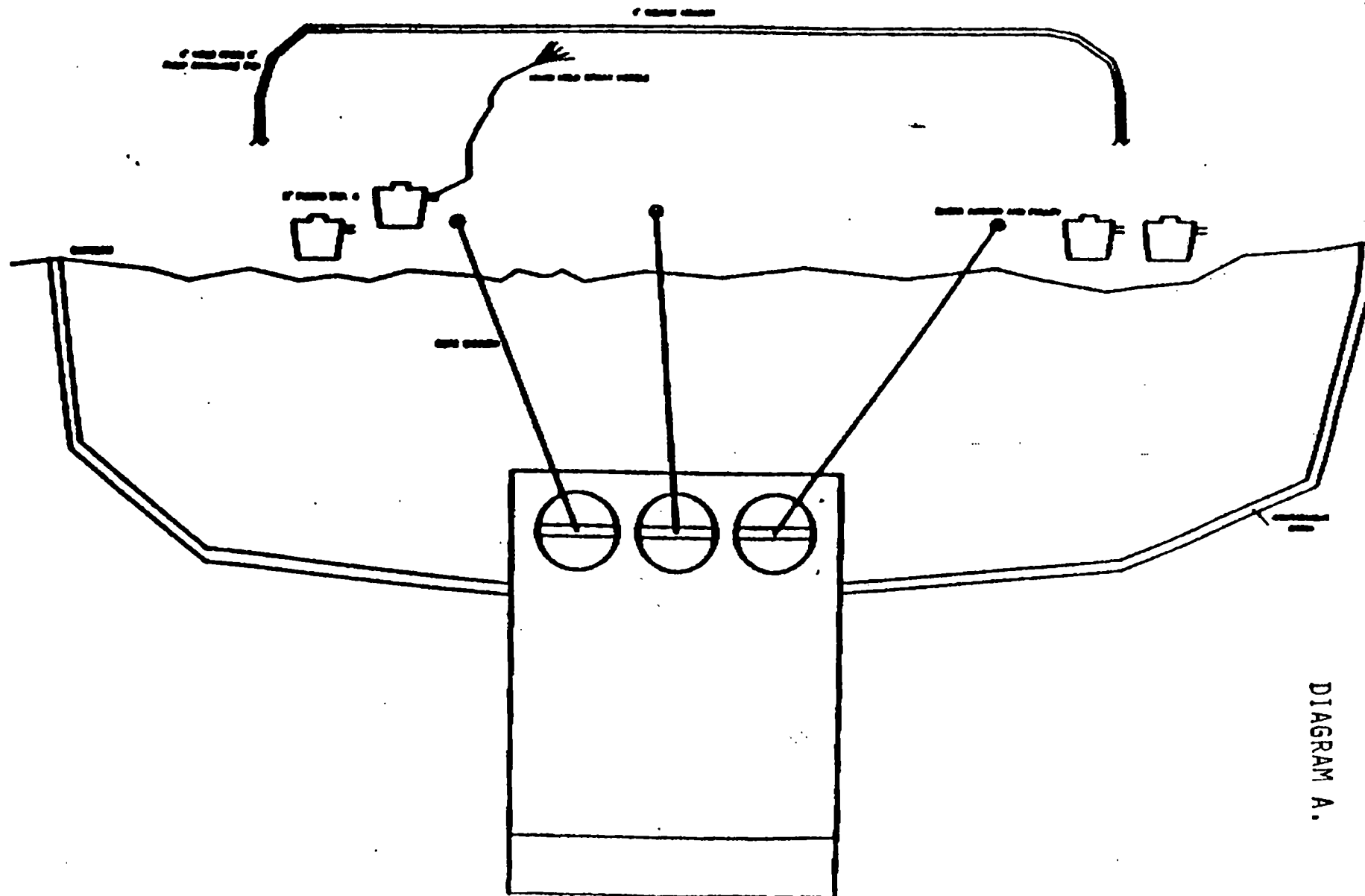
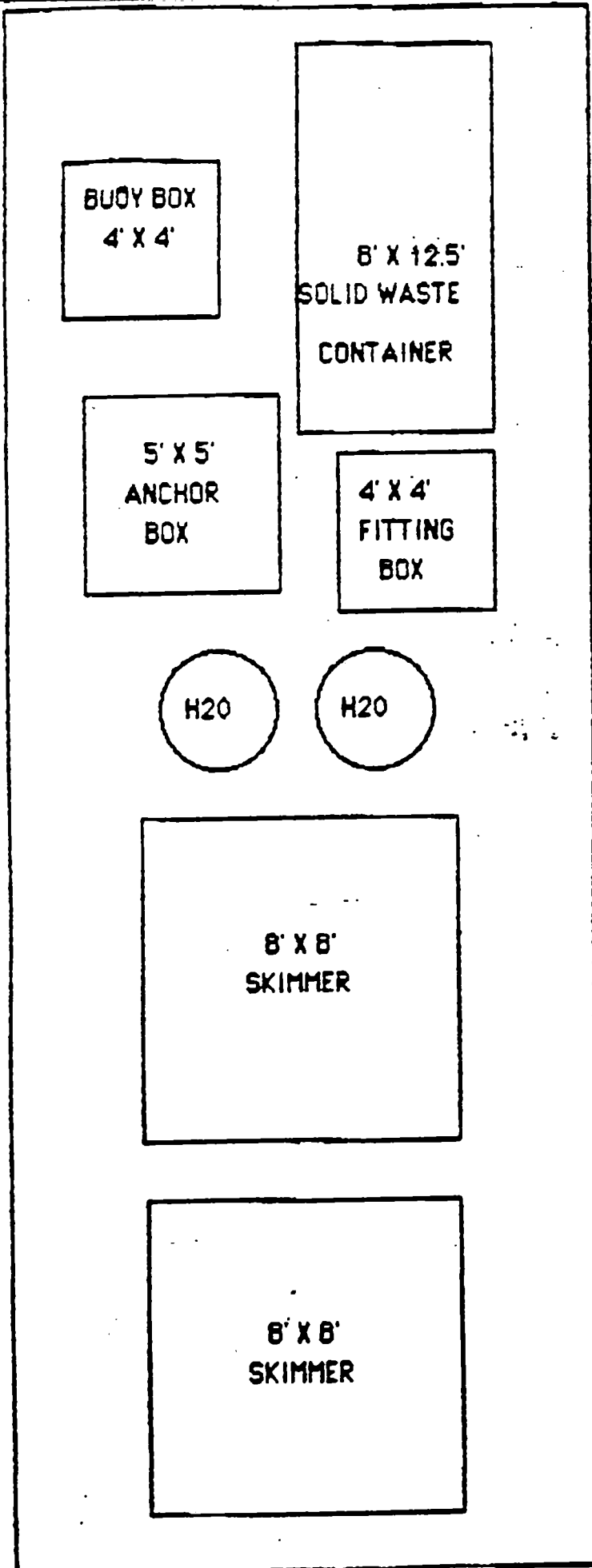
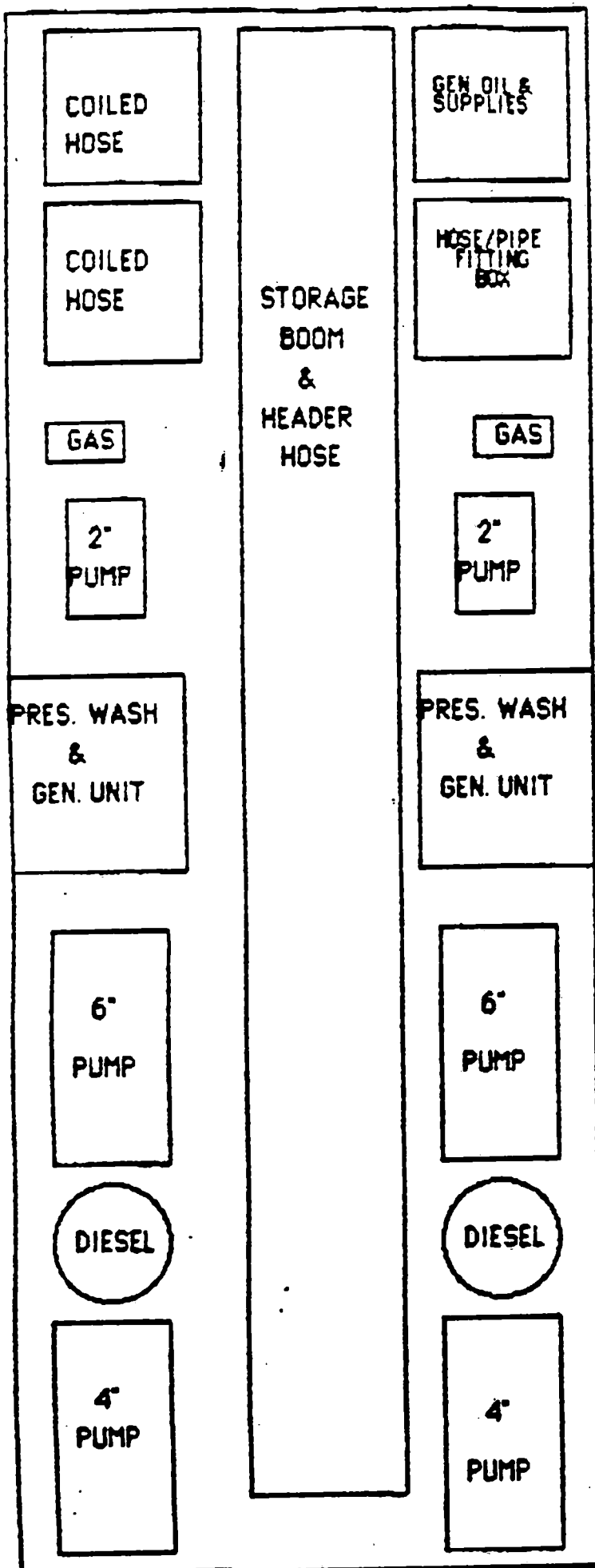


DIAGRAM A.

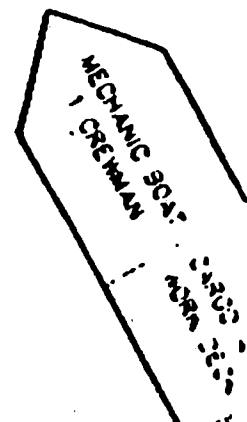
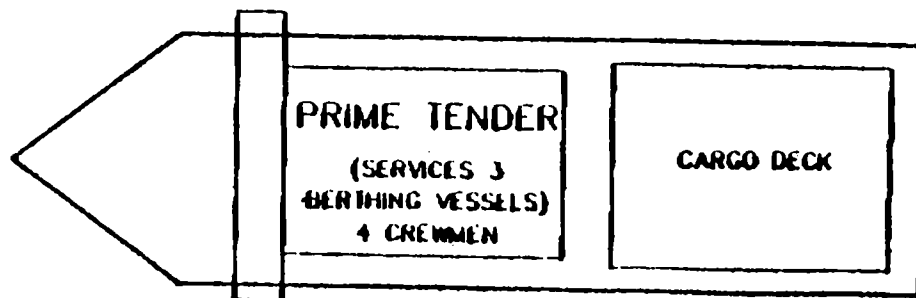
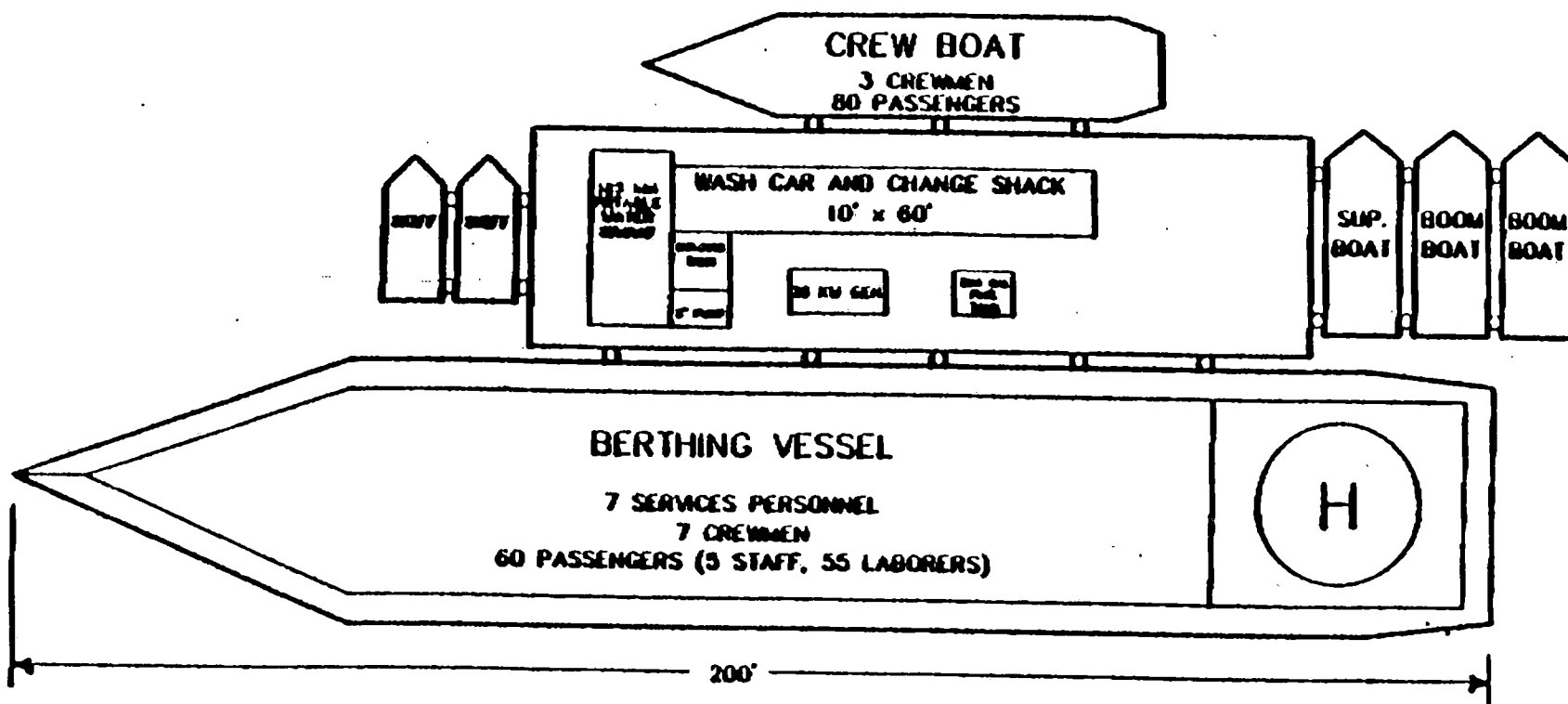


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SAMPLE BERTHING COMPLEX



● POTENTIAL MECHANICAL ENHANCEMENTS

...System enhancements are being identified and implemented as field experience and conditions dictate...

Improved water delivery systems, already identified, include:

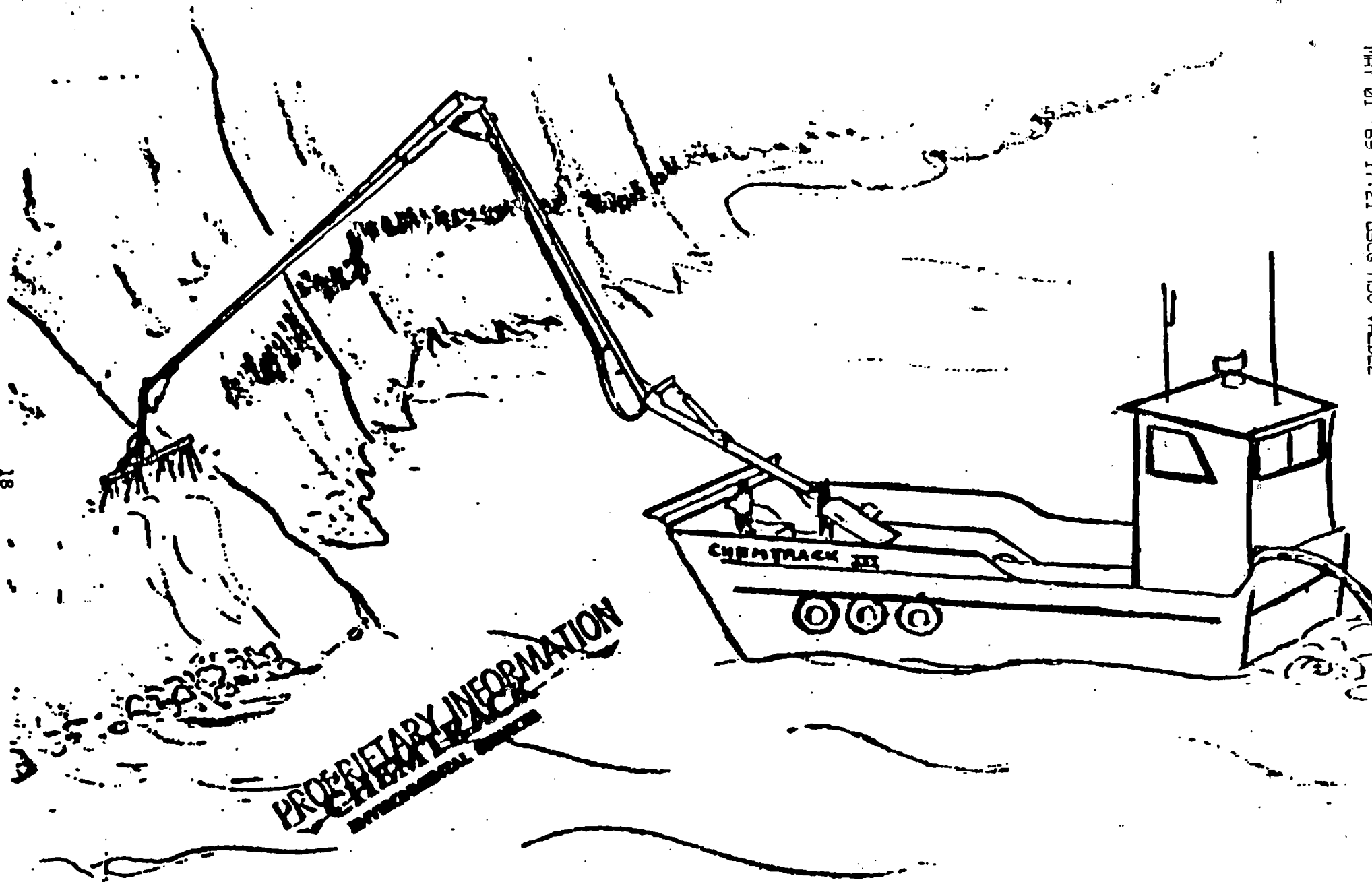
- Omni Sweep, an adaptation of a hydraulically operated telescope concrete pump. (A prototype of this device has already been successfully demonstrated in onshore tests). Attached is the conceptual diagram.
- Telescopic crane booms filled with high volume spray header and fire pumps for supply. (Similar application as the Omni Sweep).
- Elevated/remotely operated fire monitors/cannons mounted on LCV's for increased control/distance of water placement. - *Fire Boat Monitors*
- Flexible perforated header hose substituted for rigid pipe header to accomplish deluge of beach....to achieve improved conformance to the actual shoreline profile.
- Special manifolds fabricated of locally available materials to provide additional hand held hose positions utilizing larger, higher volume pumps rather than multiple smaller pumps.
- Maxibarges with containerized major equipment replacement to minimize equipment replacement/downtime.

...Work continues in several organizations/locations to identify "drop-in" equipment improvements...

- Higher efficiency, greater quantity warm water producers.
- Use of prefab shower units in berthing vessel wells to free barges for other work.
- Pumper vessels to tandem with heat transfer vessels to provide more capacity closer to workplace.
- Preheat units (fired and ambient) to increase water supply temperature.
- Improved skimming capability.

This information is provided in order to obtain your agreement to these refinements as an integral part of approving this plan.

18



OMNI SWEEP

ALTERNATIVE SHORELINE CLEANING MEASURES

BACKGROUND:

Over 1000 proposals of assistance have been received by Exxon to date. A Task Force has been established of Exxon Research & Engineering staff in Florham Park, New Jersey to provide support for categorization of materials as follows:

- Sorted various chemical, non-chemical, biological, hardware, services, etc.
- Those judged potentially applicable in the near term will be run through additional level of screening and background data collection prior to discussion with agencies.

OBJECTIVES:

Provide recommendations to Exxon Team in Alaska

- Means of accelerating base cleaning operation w/o adversely affecting cleanliness.
- Waste management/disposal.
- Removal of oil from shorelines.
- Enhanced cleanliness.

GUIDELINES:

Environmental acceptability and safety are key parameters.

Toxicology and safety review provided by Exxon Biomedical Services, Inc.

Emphasize technology, equipment, etc. compatible w/USCG-approved plan.

Use of chemical cleaning agents not in present, USCG-approved plan.

Review of proposals by experts to be documented in standard format.

Computerized data base to track proposals, allow easy access.

PROCESS:

Materials and inquiries logged in and documented.

Initial screening for environmental safety data and effectiveness at Exxon Research & Engineering in Florham Park, N.J.

Those showing initial promise with sufficient supporting data will be rapidly identified and recommended for potential field test on site in Prince William Sound.

Field test proposal and supporting data will be shared with USCG and relevant agencies for initial agreement.

Field tests will be designed and conducted in Prince William Sound by Exxon Contractors Dr. Ed Owens and staff of Woodward-Clyde.

Field test data will be immediately summarized in support of larger scale use in Prince William Sound clean-up program.

OTHER POTENTIAL ENHANCEMENTS

Numerous alternative cleaning techniques exist which Exxon is vigorously pursuing to identify those procedures which will increase the shoreline restoration rate in an environmentally safe manner. The process for screening and testing these alternatives is outlined herein.

Of these procedures, the use of non-toxic dispersants such as COREXIT 7664 appears most promising.

The basis for a pilot test has been developed to demonstrate the application/use of COREXIT 7664 surfactant. The plan is to conduct onsite, small scale tests at several representative and nonsensitive sites to confirm application rates and techniques. Laboratory scale testing is being set-up to establish calibration/toxicity data. A field test proposal is included for approval.

Work on defining additional usage of warm water, chemical and biodegradation techniques will be completed by June for incorporation in the plan.

FIELD TEST PROPOSAL

PURPOSE:

Enhance effectiveness of water wash shoreline clean-up procedure.

- More complete clean-up.
- Faster clean-up.
- Protection from potential recoiling of shore.

PROPOSED ENHANCEMENT:

Utilize non-toxic, water based, biodegradable shoreline cleaner, COREXIT 7664.

- 1% addition to water stream — 10,000 ppm
- Ambient temperature sea water stream
- Oil dispersed to non-toxic concentrations into upper levels of water column.

OVERVIEW OF PROPOSAL:

Side-by-side comparison of COREXIT 7664 approach vs. water flush.

- Boulder and/or rocky beach.
- Water column, sediment, core samples.
- Measure effectiveness/rate of clean-up.

Carry out parallel toxicity testing using rainbow trout, salmon and zooplankton (Mysid shrimp, polychaetes) in dispersed oil at different concentrations/exposure times.

Proceed with application of this enhancement after complete analysis of results of above two test programs.

TOXICOLOGICAL CONSIDERATIONS OF COREXIT 7664

Most tests conducted circa 1970 when chemical toxicity was a concern. Fifteen agencies published toxicity data regarding COREXIT 7664 over a several year period on a large variety of species (ie. approximately 30.) This resolved concern since 96 Hr. TLM values were in the 10,000 ppm range. This is many orders of magnitude higher than concentrations present in the water column after field application.

Of more concern, understandably, was the toxicity of COREXIT 7664 dispersed oil droplets. Laboratory investigations have shown that COREXIT dispersed oil is more toxic than COREXIT 7664 itself. However, the most meaningful data on the environmental effect of dispersed oil is derived from actual large scale field application in Tampa Bay. The essential features of this application:

- February 1970, DELIAN APPOLLON spilled large amount of Bunker C oil in Tampa Bay. There was extensive oiling of seawalls and the encrusting forms of marine life, i.e. barnacles and oysters. Approximately 200 miles of shoreline was covered. A study was conducted by Texas A&M to determine impact of chemical cleaning by measuring species diversity and population of bottom invertebrates.

NUMBER OF SPECIES FOUND IN MAY-JUNE

<u>Station</u>	<u>May</u>	<u>June</u>	<u>Total</u>
Control	38	34	53
Venetian Isle	43 (oiled)	64 (cleaned)	73
Lewis Isle	51 (oiled & cleaned)	62 (oiled & cleaned)	81

CONCLUSION:

Based on this study, the only possible conclusion is that the cleanup operation, using these particular chemicals, had no effect either of a permanent or temporary nature.

IV. - TELECOMMUNICATIONS

INTRODUCTION/BASES

The Telecommunications Plan for Exxon's Shoreline Restoration effort was developed to provide telecommunications in areas defined as Sector 1 through Sector 3 of the Prince William Sound area of Alaska and elsewhere. The intention of this plan is to support the objectives of all phases of the restoration activities. Telecommunications equipment and resources are being supplied by EUSA-ICS TELECOM.

PLAN ASSUMPTIONS

- The Telecom infrastructure will support the equipment and personnel ramp-up outlined in the base plan.
- The area of coverage will be as defined in the base plan.
- The communication path will follow the command structure, i.e. Valdez will communicate with the berthing vessels, the berthing vessels will communicate with the Exxon/VECO supervisors, the Exxon/VECO supervisor will communicate with the beach supervisors.
- Life/Safety channel of communications will be maintained from the support vessels and the shore area at all times.
- The communications infrastructure will support both Exxon and VECO.
- The communication infrastructure is being built to specifications that will support operations through 15 September, 1989.

SYSTEM DESIGN

Exxon has established a wide area UHF system (Exxon Command Operations) which covers Valdez, Naked Island, Jack Peak, Latouche Islands, Montegue and Ester Islands. These UHF sites have been utilized for the free oil clean-up communication system. In order to speed the implementation of the shoreline restoration communication system it has been decided to continue to use these locations augmented by additional equipment as well as additional frequencies.

In addition, VECO has established UHF repeaters at Naked Island, Chenega, and Rugged Islands. This equipment will be added into the Exxon Operations Network. Area coverage and certain economies of scale can be accomplished by the co-location of both the Exxon and VECO repeaters at a developed site location.

Starting on 20 April, 1989, area coverage surveys were begun to all locations defined under the base plan. Upon completion of this survey and after data reduction occurs, the final repeater site locations will be selected. It is assumed to be the nature of the Prince William Sound that 100% coverage cannot be effected. Therefore, provisions are being made to provide "gap fillers" for those areas that cannot reach one of the repeater sites that have been placed in operation. The three gap fillers options are as listed below:

- Ruggedize portable repeater
- Communication relay vessel
- Portable "Ku" satellite earth station

These gap fillers will be used on a shoreline specific basis.

The Operations Division should notify the Telecom Division a minimum of 48 hours prior to deployment of a shore-team into a location requiring a gap filler. Telecom will provide the equipment and resources to implement the gap filler.

In addition to the Exxon Company Operations Network, Inmarsat is being installed on all berthing/command vessels. With Inmarsat aboard, these ships will have the capability of dialing by telephone to any shore-based telephone worldwide. In addition, ship-to-ship communications can be obtained to any Inmarsat equipped vessel. Though this capability is being deployed on all berthing/vessels, it should be utilized only for "private" voice traffic, facsimile, or data transfer.

VALDEZ

Exxon Command Network Control has been established in Room 210 of the Exxon command Center. A remote console is being established for VECO at the Tititlek Building. Specific channels have been remoted to the Operations Division for their intended use.

COMMAND BERTHING VESSELS

To date, all Command/Berthing vessels, which have been designated as such by the project, have had Inmarsat, UHF and VHF Marine, installed on the vessel. As additional ships are identified, this standard equipment will be installed on each ship.

SHORELINE RESTORATION CREWS

The shoreline restoration crews will be able to communicate within their specific work assignment areas by use of a simplex hand-held radio to hand-held radio on a UHF frequency channel. This frequency will also be available on each of the barges, skiffs or workboats. Exxon and VECO will share this channel assignment. Foremen and Superintendents will be provided with an operating frequency (channel) in which they will be able to talk to the berthing/command vessel supporting their area of responsibility. Both VECO and Exxon will have their own separate set of frequencies (channels) assignments.

In addition, shoreline foremen will have a VHF marine hand-held radio for use as backup in the case of a critical safety or injury situation. VHF marine is aboard all floating vessels under contract to Exxon.

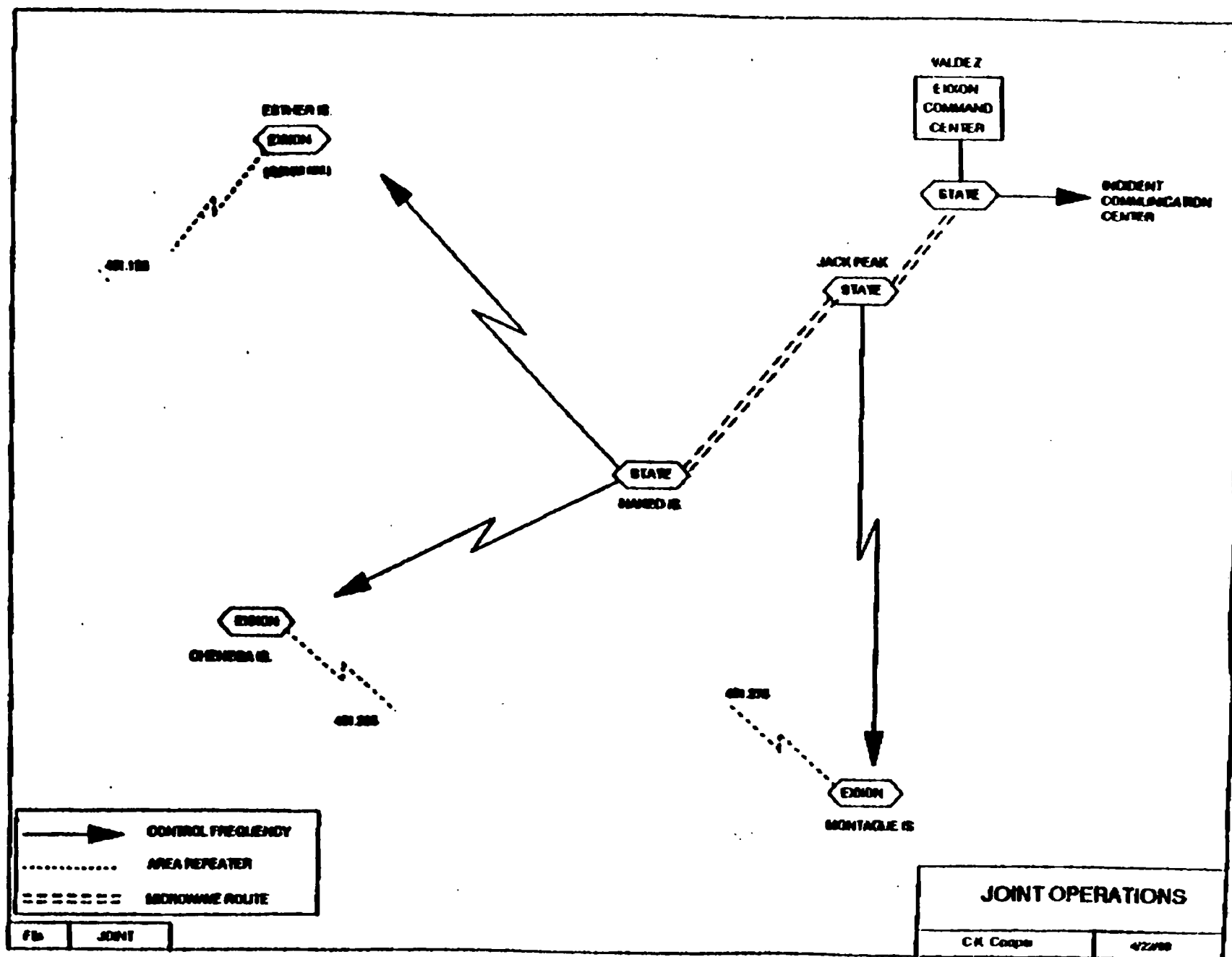
EQUIPMENT REQUIREDMobiles

<u>Quantity</u>	<u>Vessel Type</u>	<u>UHF</u>	<u>VHF</u>
13	Berthing	13	13
52	Barge	52	52
91	Skiff	91	20
97	Work	97	
20	Crew	20	
14	Skimmers	14	8
9	Tug	9	
10	Mechanic	10	
	Contingency <u>20%</u>	<u>60</u>	<u>17</u>
	TOTAL MOBILES...	<u>366</u>	<u>110</u>

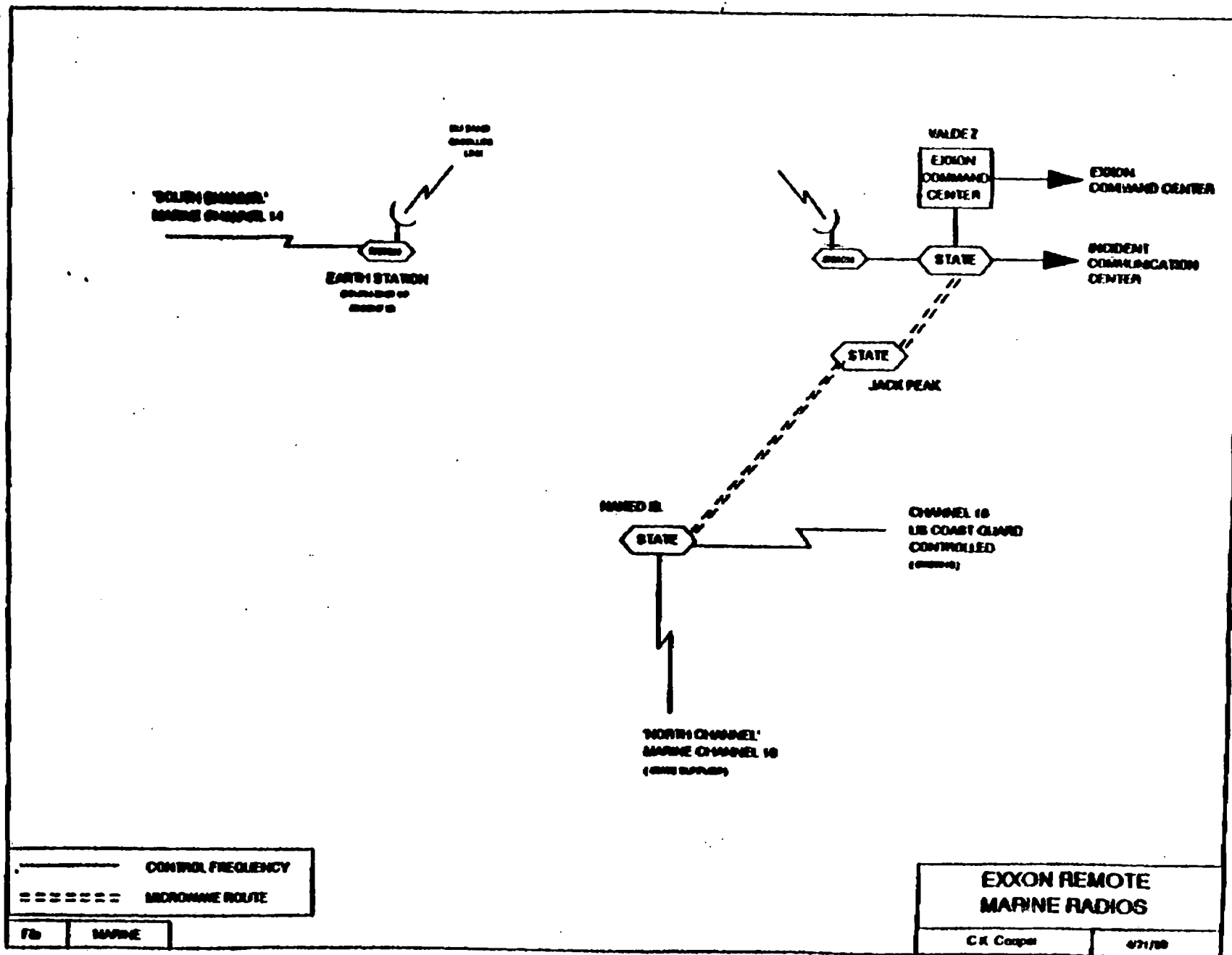
Hand-helds

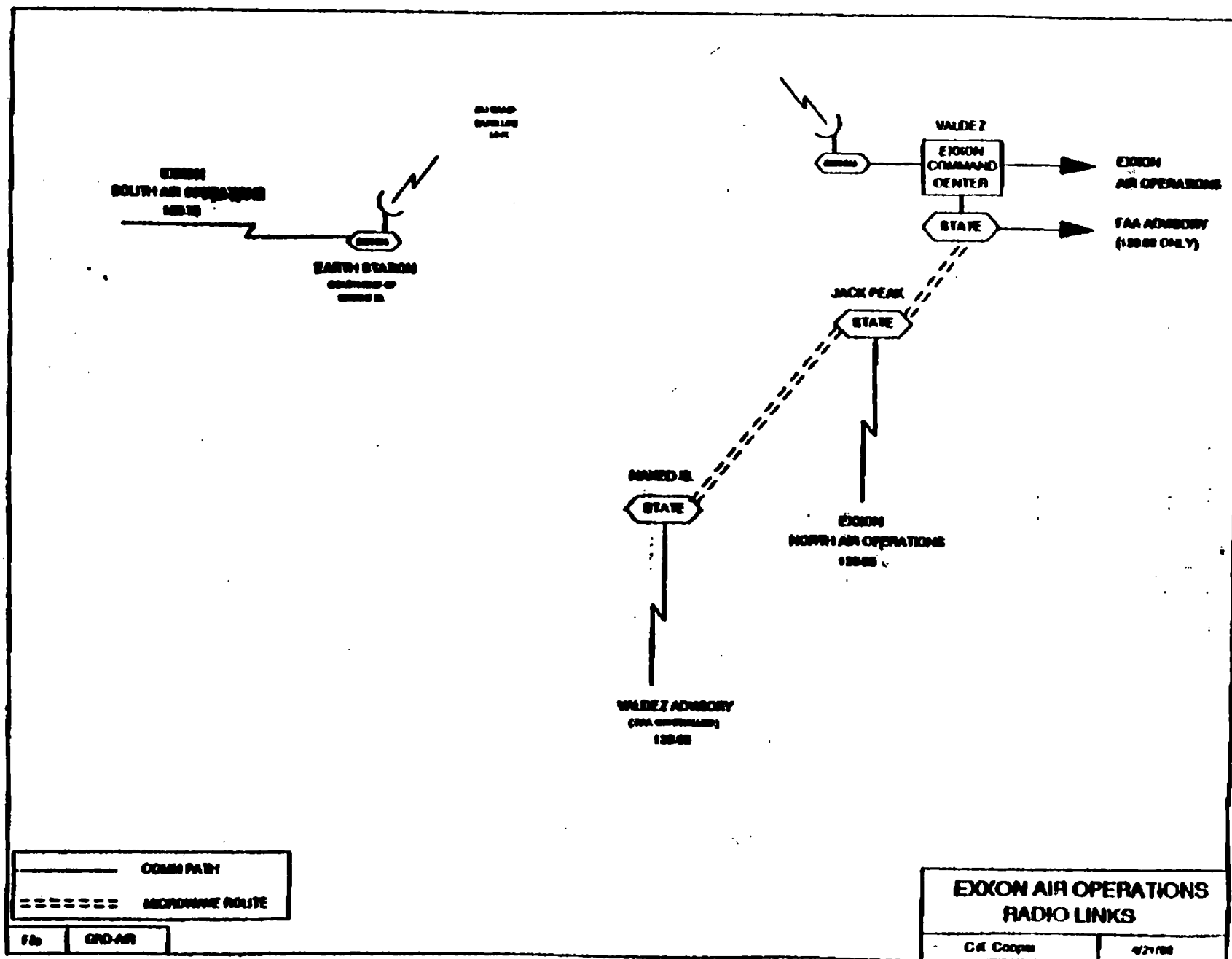
	Exxon - MPT's	34	54
	VECO - Foreman/Asst.	108	54
	VECO - Supervisors	54	
	VECO - Medics	16	16
	VECO - Safety	25	25
13	Berthing	26	
52	Barge	104	
91	Skiff	91	
97	Work	97	
20	Crew	20	
14	Skimmer	14	
9	Tug	9	
10	Mechanic	10	
	Contingency <u>20%</u>	<u>122</u>	<u>26</u>
	TOTAL	<u>750</u>	<u>175</u>

24 ea.	UHF Repeaters (fixed station)
5 ea.	UHF Portable Repeaters
2 ea.	"KU" Portable Earth Stations

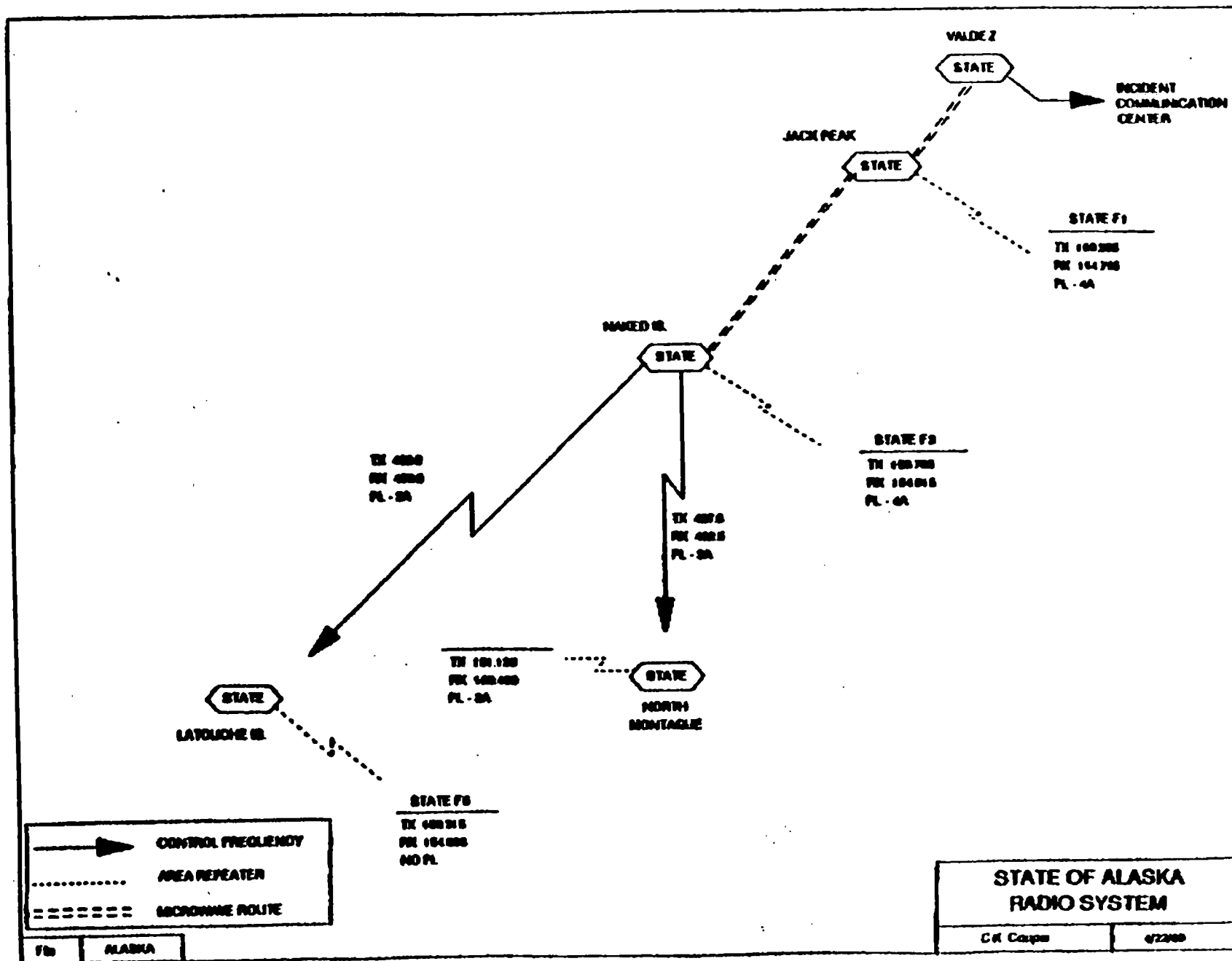








32.



V. - ASSUMPTIONS

PERMITS/APPROVALS:

- Approval for future shoreline clean-up operations and sign-offs of shoreline work completion are received without delays.

RESTORATION SCOPE/BASIS:

- Total area to be restored is based on that defined on 4/21/89 ADEC maps covering Prince William Sound, and initial aerial surveys of Southern areas of the Kenai Peninsula by ADEC and Exxon.
- Average width of contaminated beach is 30 feet.
- Acceptable level of cleaning of uniform beaches is achieved by low pressure, cold water flush/float (maximum 3 passes/area). High angle areas and rock faces will be treated with warm water. Based on onsite USCG approval, variations can be approved after recommendation by Exxon and advice from onsite agencies.
- Clean-up operations will be conducted within the environmental windows as currently defined.
- Production/progress estimates are based on current/limited data base.
- Some allowances have been made for re-oiling. Ongoing efforts are directed toward minimizing the potential for re-oiling.

DOWNTIME/OTHER CONSTRAINTS:

- Weather related inside PWS: Apr 30%-Actual, May 20%, Jun 10%, Jul 10%, Aug 20%, Sep (1st half) 20%, Sep (2nd half) & Oct 80%.
- Mechanical: 15%
- Weather related outside PWS: Downtime factors are 50%, to account for logistical and weather considerations.
- Shoreline washing can be conducted primarily during low tide only (6-10 hours per day).
- Smaller components required for restoration vessels (hoses, pumps, etc.) readily available off the shelf and will not cause delays.
- Preventive and normal maintenance work, and minor repairs to restoration equipment, can be achieved during high tide/ weather downtime.
- No additional productivity/downtime delays are encountered due to interference between shoreline/offshore operations, logistics or waste disposal.

RESOURCES:

- Local resources will be available and utilized to the extent possible.
- Additional training requirements, which have been increased to account for the new State requirements, will not cause delays.
- Personnel attrition in the range of 20% per month.

VI. - RESTORATION STRATEGY

The following hierarchy has been adopted to provide the most environmentally sound sequencing for the overall schedule.

<u>Priority Class</u>	<u>Statute Miles Per Priority Class</u>	
1	3	Pinniped haulout areas on five islands.
2	85	A: Heavy contamination in areas of environmental sensitivity. B: Heavy contamination in areas of no environmental sensitivity.
3	85	A: Moderate contamination in areas of environmental sensitivity. B: Moderate contamination in areas of no environmental sensitivity.
4	191	A: Light contamination in areas of environmental sensitivity. B: Light contamination in areas of no environmental sensitivity.

NOTES:

1) Lightly oiled areas might not require cleaning, if environmental considerations indicate that allowing natural forces to operate produces a better result than the mechanical process. It is expected that this will be the case for all lightly oiled Gulf of Alaska sites. An exception to this is those accessible areas lightly oiled by tarballs. Procedures are in place for that work to proceed in a non-mechanical manner immediately.

2) The first three priorities are the most difficult to clean. As a result the cleanup rate in terms of miles per day or miles per unit are lower in the early part of the schedule. This is reflected in the operational plan, so as to have an environmentally sound program.

Shoreline Restoration
Execution Plan

(Statute Miles)

-----ADEC 4/21 Shoreline Data-----

Shoreline	Impacted Shore	Shoreline	Impacted Shore	% Open	Shoreline To Be Cleaned	Class 1	Class 2	Class 3	Class 4
S. Esther Island	0.0	Naked Island Complex	15.7	17.0	13.0	0.0	0.0	3.6	9.4
Axel & Dutch Group	0.0	Lone Island	3.7	20.0	3.0	0.0	0.9	0.5	1.5
Perry Island	12.3	Perry Island	12.3	20.0	9.8	0.0	2.2	3.8	3.9
Lone Island	3.7	Culross Island	3.2	20.0	2.6	0.0	0.4	1.5	0.7
Story Island	0.0	Ingot/Disk Island	19.9	5.0	18.9	0.0	5.1	11.5	2.3
Peak Island	0.8	Eleanor Island Complex	14.8	13.0	12.9	0.0	7.7	3.5	1.7
Naked Island	14.9	Knight Island Complex	90.6	20.0	72.5	0.0	35.0	19.6	17.9
Mainland Culross Passage	0.0	Smith/Little Smith Island	7.9	0.0	7.9	0.8	7.1	0.0	0.0
Culross Island	3.2	Green/Little Green Island	20.0	5.0	19.0	0.5	10.5	0.0	8.0
Applegate Island	1.4	Seal Island	2.0	0.0	2.0	0.5	1.5	0.0	0.0
Nellie Juan to S. Eshamy	21.8	Applegate Rocks	1.4	0.0	1.4	1.4	0.0	0.0	0.0
S. Eshamy to Tigre Glacier	4.0	Montague Island	15.0	20.0	12.0	0.0	0.0	1.6	10.4
Eleanor Island	10.2	Chenega Group	11.0	38.0	6.8	0.0	3.2	2.3	1.3
Ingot Island	13.4	Nellie Juan to Eshamy	21.8	0.0	21.8	0.0	3.9	11.9	6.0
Disk Island	6.5	Eshamy to Tigre	4.0	0.0	4.0	0.0	0.0	0.5	3.5
Sphinx Island	3.4	Tigre to Junken	16.3	20.0	13.0	0.0	0.0	0.0	13.0
Entrance Island	1.2	Letouche Island	21.8	25.0	16.4	0.0	3.0	8.0	5.3
Smith Island	6.5	Evans Island	38.0	20.0	30.3	0.0	0.0	4.8	25.2
Little Smith	1.4	Bainbridge Island	9.1	20.0	7.3	0.0	0.0	0.0	7.3
Seal Island	2.0	Elrington Island	20.0	20.0	16.0	0.0	0.0	0.0	16.0
Knight-Herring to Bay of Isles	41.3	Elrington Island	0.5	40.0	0.3	0.0	0.0	0.0	0.3
Knight-Bay of Isles to Snug	22.4	Fleming Island	--	--	--	--	--	--	--
Knight-Snug to Thumb Bay	18.2	Cape Junken to Cape Fairfield	--	--	--	--	--	--	--
Knight Island (Tot 81.8 MI.)	0.0	Cape Fairfield to Fault Point	--	--	--	--	--	--	--
New Year and Squirrel	1.6	Fault Pt to Cape Resurrection	42.6	32.0	19.3	0.0	0.0	5.1	23.9
Mummy Island	4.6	Cape Resurr'n to Cape Aialik	29.0	33.0	9.1	0.0	0.0	1.6	17.7
Squire Island	2.5	Cape Aialik to Granite Island	14.0	35.0	9.1	0.0	0.0	0.0	9.1
Green Island	28.0	Granite Island to Pye Islands	15.0	20.0	12.8	0.0	2.0	4.0	6.0
N. Montague	2.0	Muka Area	5.0	20.0	4.0	0.0	2.0	1.0	1.0
Chenega Delenia & Junct'n Isles	11.0	Gore Area	--	--	--	--	--	--	--
Main'd Tigre Glacier to Cape Ju	16.3	Chugach Area	--	--	--	--	--	--	--
Evans Island	32.6	Kachemak Bay	--	--	--	--	--	--	--
Elrington Island	13.0	Kodiak	--	--	--	--	--	--	--
Letouche	21.0								
Subtotal	314.4	Total	454.6		364.2	3.2	84.5	84.8	191.4

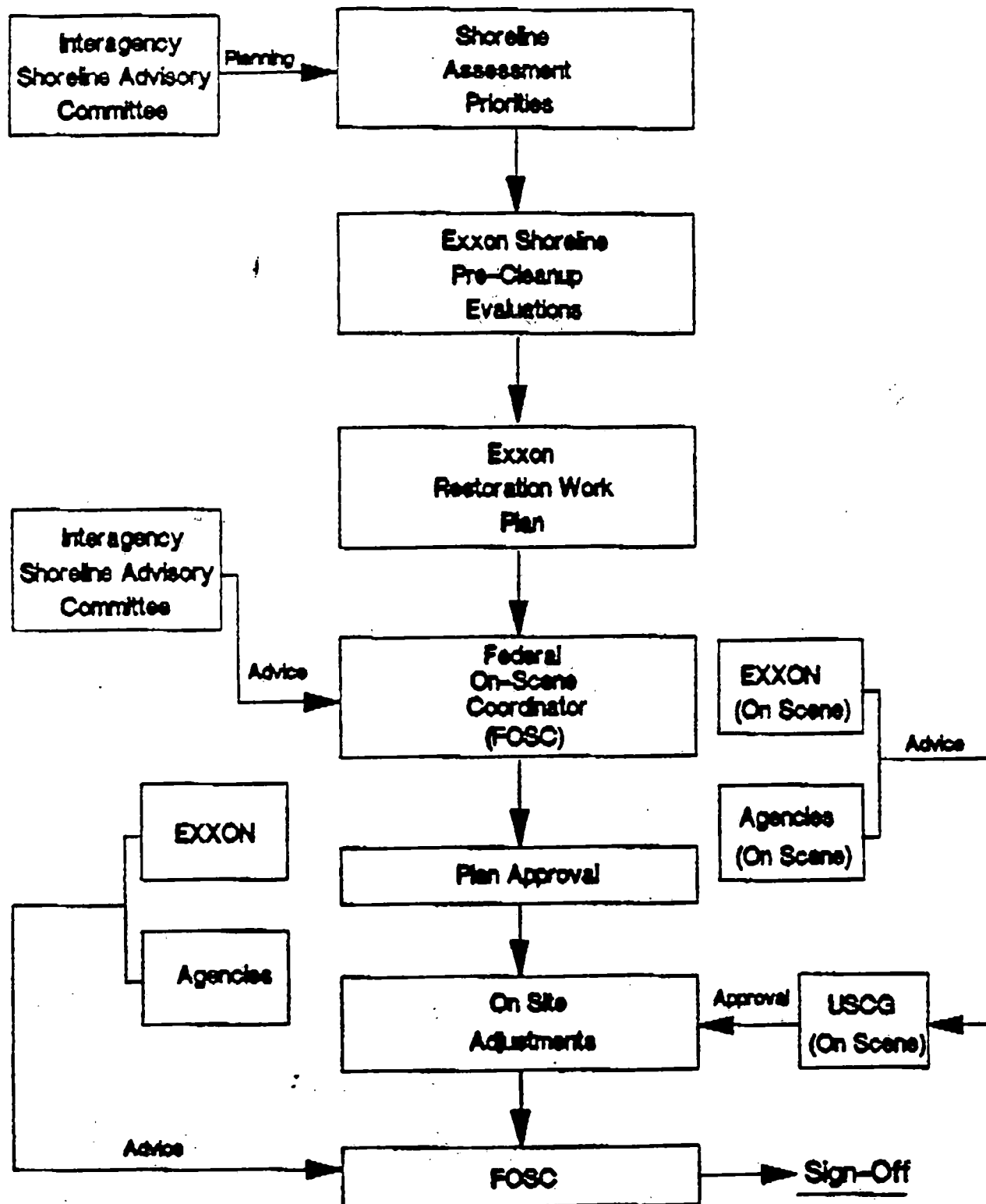
Gulf of Alaska

E. Rees'n Bay & Rugged Island	13.8
Aialik Bay and Cape	28.8
Harbor & Matoa Islands	13.3
Chiswell Islands	6.6
Granite Island	9.1
Two Arm Bay to Rugged Island	14.8
Subtotal	85.6
Total	400.0
Exxon Allowance for Areas Not Surveyed by ADEC	54.6
Total	454.6

Notes:

- 1) Open shoreline covers exposed high energy segments where lightly contaminated areas and some moderately contaminated areas will be rapidly dispersed and degraded by natural forces.
- 2) ADEC surveys for Montague, Evans, Bainbridge, Elrington, Fleming Islands and Muka/Gore areas are incomplete. Estimates for impacted shorelines in these areas have been included.
- 3) Data above based on April 21 ADEC surveys.
- 4) The April 15 plan was expressed in nautical miles. The data above is expressed in statute miles to facilitate a broader understanding.

Shoreline Restoration Approach Flowchart



Note: EXXON responsible for operation management and scheduling of work after approval of FOSC.

VII. - MAPPING

Exxon acknowledges it's responsibility to obtain sufficient data to identify all beaches which have been oiled. To achieve this objective Exxon has committed significant resources to develop accurate base maps of shorelines in Prince William Sound and along the Kenai peninsula. These maps will provide a base for superimposing impacted areas as they are identified.

The Exxon Response Team has assembled a mapping facility located in the Exxon Command Center to assist shoreline clean-up operations. This equipment will be used to manage the information needed to insure that shoreline clean-up activities proceed in an orderly and effective manner.

The facility consists of a PC computer system based on a Compaq 386/25 with 110 Mbyte hard drive, a laser printer, and a Hewlett Packard Draft Master II map plotter. The software allows digitized maps to be stored and then reproduced on any scale with the map plotter. Eight-colour maps can be produced in sizes up to 36" wide and of unlimited length. Maps and the information to be added to them are stored on separate memory planes in the software system. This provides a very flexible method of annotating maps or adding features.

Information to be added to the maps can be input to the system either through the keyboard or by means of a mouse or drawing tablet. Thus both comments and added or modified map features are easily plotted.

A second standby system will be installed consisting of 386 based PC computer with software developed by Nucor Inc. A feature of this equipment is the ability to digitize drawings or other information very quickly with a laser scanner. Information can be captured from video signals (from a video camera or tape) as well. This system also stores information in memory planes which can then be added to any map at any map scale desired.

Maps of Prince William Sound and the Kenai peninsula are currently being digitized and are expected to be installed on the system by May 1.

The shoreline which will require cleaning will be identified by multi-spectral-scanner surveys initially and subsequently enhanced by detailed shoreline assessments. This information will be input into the computer mapping system so that detailed (up to 1:100 scale) maps can be generated which will form the basis for identifying all shoreline segments which require cleaning.

VIII. - SCHEDULE

MILESTONES

It is recommended that milestones be tied to completion of priority classifications. The milestones and completion dates shown below represent an operationally and environmentally sound program.

<u>Milestone #</u>	<u>Priority</u>	<u>Cum. Miles</u>	<u>Completion Date</u>
1	1	3	May 10
Interim		20	June 1
2	2	88	July 1
3	3	173	Aug 1
4	4	364	September 15

The scope of required clean-up in priority 4 and Kenai Peninsula areas is difficult to define fully based on current data. We have therefore combined these for the final milestone. With these distant dates and targets, this flexibility allows resource alleviation and improved procedures to be applied if necessary.

This also allows the program to be adjusted if any classification changes occur (re-oiling, or clean-up by storms).

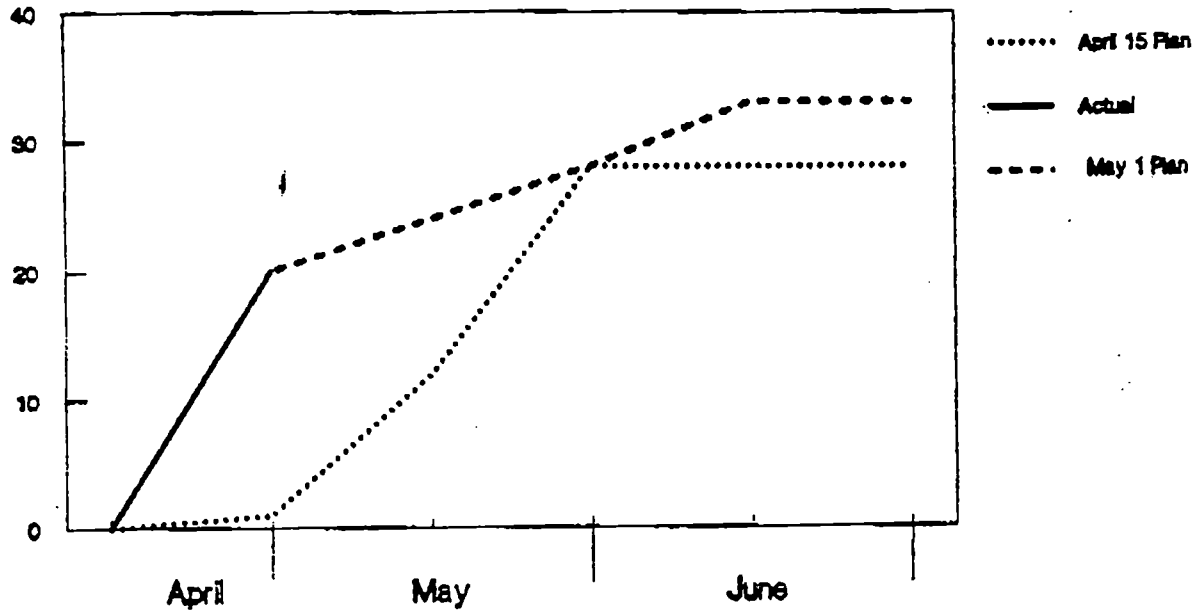
The clear objective is to clean up the beaches in an operationally sound manner that gives the best environmental results. Some flexibility in forward planning will facilitate this.

We therefore propose that these milestones be reviewed when major factors change.

Shoreline Restoration

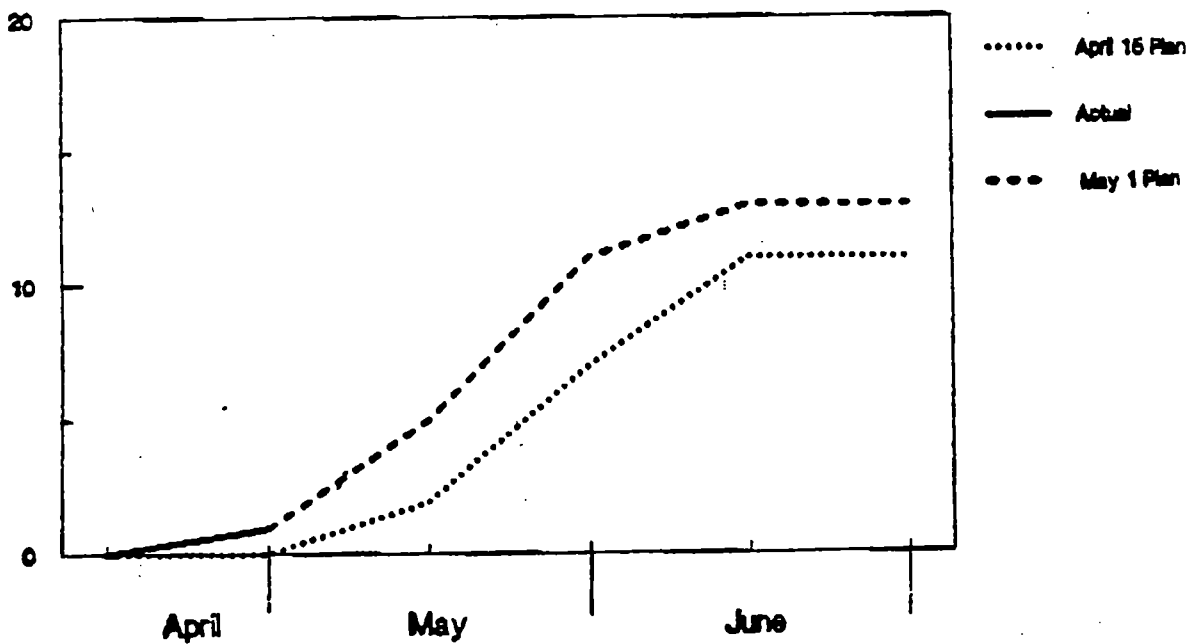
LCV Deployment

Number of Vessels



Barge Deployment

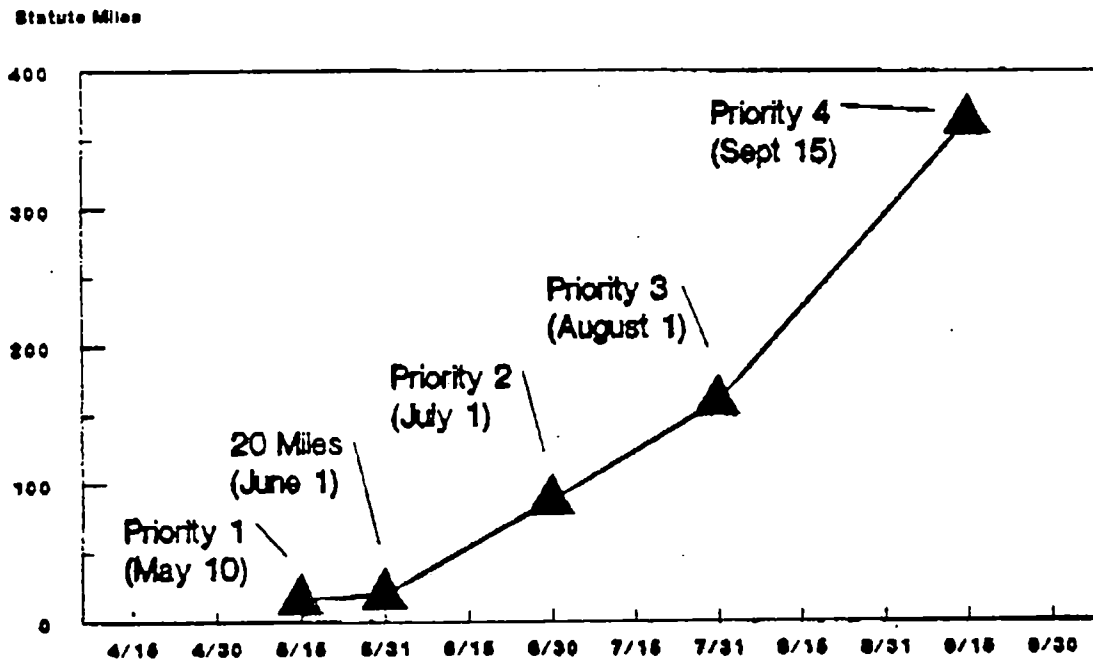
Number of Vessels



Shoreline Restoration

Current Outlook

Shoreline Restoration Progress Milestones



Changed Items

- Reduced number of miles of oiled beaches in PWS*
- Updated mix of heavy, medium and light contamination*
- Updated weather down-time
- 33 effective LCV's and 13 effective maxi-barges
- Personnel peak due to modified fleet and rotation basis

Unchanged Items

- April 15 plan productivity

* Based on April 21 ADEC survey, adjusted for open shoreline and estimation for the impacted areas in the Gulf of Alaska

TI

(Exxon V

**United States
Coast Guard**



2 Klon. & Lenny

COMMENTS:

INCIDENT MEMO

U.S. Department
of Transportation

United States
Coast Guard



Commandant
United States Coast Guard

Washington, D.C. 20593-0001
Staff Symbol:
Phone:

COMMAND CENTER INCIDENT MEMO

Photocopy-Preservation

VALDEZ - 41
9 MAY 1989

INCIDENT: MAJOR OIL SPILL, VALDEZ, ALASKA
DATE OCCURRED: FRIDAY, 24 MARCH 1989
SOURCE: T/S EXXON VALDEZ
NATIONALITY: U.S.
SUBSTANCE: ALASKAN NORTH SLOPE CRUDE OIL
AMOUNT SPILLED: 240,000 BBLS (10.5 MILLION GALLONS)
SPECIAL FORCES: NATIONAL STRIKE FORCE
NOAA SSC
NAVY SUPSAL
PIAT
ERT
LOCATION: PRINCE WILLIAM SOUND
OSC: MSO VALDEZ

SUMMARY:

OIL POLLUTION SURVEY:

PRINCE WILLIAM SOUND - OVERFLIGHT OF WORK SITES, TO PT. HELEN, INTO HERRING BAY, NORTHWEST BAY, KNIGHT IS. UPPER AND LOWER PASSAGE. LIGHT SHEEN AND RIBBONS OF SKIMMABLE OIL IN VICINITY OF SMITH AND SEAL ISLAND, PT. HELEN, UPPER PASSAGE, NORTHWEST BAY, AND KNIGHT IS. PASSAGE.

WESTERN ALASKA - ADVERSE WX CONTINUES TO HAMPER OR PRECLUDE WESTERN ALASKA OPS. RESURRECTION BAY, CHISWELL AND PYE ISLANDS, MACARTHUR PASS, AND SOUTHERN AIALEK BAY: NO HEAVY CONCENTRATIONS OR FREE FLOATING OIL OBSERVED. KODIAK AREA-SIGHTED SHEEN OFF PAULE BAY.

SKIMMING: PRINCE WILLIAM SOUND - OPERATIONS FOCUSED ON AREAS BETWEEN SMITH IS. AND LITTLE SMITH IS., VICINITY OF NORTHWEST BAY, AND POINT HELEN. RECOVERED EST 181 BBLs OILY WATER.

WESTERN ALASKA - SEWARD AREA: NO SKIMMING OPS. DUE TO WX. HOMER AREA: WX HAS SUSPENDED ALL SKIMMER OPS. KODIAK AREA: WX RESTRICTING OPS.

SHORELINE OPERATIONS: PRINCE WILLIAM SOUND: OPS LIMITED TO SOUTH POINT OF LITTLE SMITH ISLAND. WX PRECLUDED APPROACHING OTHER AREAS WITH SMALL CRAFT. WORKED ON 500 YARDS OF SHORELINE; NO OIL REMOVED; EST 355 CUBIC YARDS OF DEBRIS INCLUDING OIL SOAKED SORBENT REMOVED. 180 WORKERS. EST DATES FOR COMPLETION: SMITH ISLAND (ARCH POINT) - 2 DAYS; LITTLE SMITH ISLAND - 7 DAYS; SEAL ISLAND - 2 DAYS; APPELEGATE ROCKS - 1 DAY (EST TIME TO COMPLETE WORK SITE IS BASED ON REMOVING SURFACE OIL ONLY).

WESTERN ALASKA - RESURRECTION BAY: 33 WORKERS RECOVERED 50 BAGS ON NON-OILY DEBRIS - RESOURCES TO BE REALLOCATED. HOMER AREA - WINDY BAY, 40 WORKERS, ELIZABETH IS., 70 WORKERS. KODIAK AREA - BIG FORT CHANNEL: 20 SHORE WORKERS; EST 30% COMPLETE, 2 WKS TO GO. HALLO BAY (KATMAI NAT'L PARK): SEVERE WX HAMPERING EFFORTS.

OPERATIONS: W. AK. ASS'T OSC RESOLVED CONFUSION ON POLICY REGARDING NON-OBTRUSIVE SHORELINE CLEANUPS; WILL ENSURE REMOTE COMMAND POSTS USE GUIDELINES. EXXON WILL TEST USE OF OF PEAT MOSS ON 100 YD SEGMENT OF APPELEGATE IS. SHORELINE ON 9 MAY.

PUBLIC AFFAIRS: PREVIOUSLY REPORTED CONGRESSIONAL HEARINGS WERE HELD 7, 8 MAY. PHOTOJOURNALISTS SENT TO USS FORT MCHENRY TO COVER GREEN IS. CLEANUP. AWAITNG HAYCOX PRODUCTIONS CONFIRMATION OF CONTRACT TO DOCUMENT CLEANUP. CREATED 2 SLIDE SHOWS OF OIL SPILL W/SCRIPT.

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09 MAY 89
WEATHER FORECAST

PRINCE WILLIAM SOUND

WINDS: VARIABLE WINDS TO 15 KNOTS
SEAS: TO 3 FT
CLOUD COVER: MOSTLY CLOUDY
PRECIPITATION: SHOWERS

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GULF OF ALASKA (CAPE SUCKLING TO GORE POINT)

WINDS: GALE WARNING NW WINDS TO 35 KTS WITH
HIGHER GUSTS TO 50 KTS
SEAS: TO 13 FT
CLOUD COVER: MOSTLY CLOUDY
PRECIPITATION: SHOWERS

OUTLOOK:

PRINCE WILLIAM SOUND: VARIABLE WINDS TO 15 KTS SEAS TO 3 FT.

CAPE SUCKLING TO GORE POINT: VARIABLE WINDS TO 15 KTS SEAS 4-5 FT.

MAY 9 1989

FACT SHEET

OIL RECOVERED:	51,000	BBLs
EVAPORATED	84,000	BBLs
BIODEGRADED	12,000	BBLs
BURNED	19,000	BBLs
DISPERSED	12,000	BBLs
PRINCE WILLIAM SOUND		
COLLECTABLE	4,000	BBLs
WIDELY DISPERSED	14,000	BBLs
SHORELINE	36,000	BBLs
GULF OF ALASKA		
OFFSHORE	9,000	BBLs
SHORELINE	7,000	BBLs
SHORELINE CLEANED	3,446	YDS

Photocopy-Preservation

VESSELS OFFSHORE:

I. DEPLOYED

6	TANK BARGES, TOTAL CAPACITY	<u>175,000</u>	BBLs
2	SUPPORT BARGES (1 STANDBY)		
10	BERTHING VESSELS		
14	TUGS		
35	LANDING CRAFTS LCM/LCA/LCV		
453	OTHER VESSELS (20'-195')		
<u>98</u>	MOSQUITO FLEET		
618	TOTAL DEPLOYED		

II. ENROUTE

<u>NAME</u>	<u>SIZE</u>	<u>ETA</u>
BARGES		
OIL	2 EA 110 X 40	5/12
SECTIONAL	1 EA 90 X 40	5/12
SUPPLY VESSELS	6 EA 185'	5/28

BOON:

I. DEPLOYED

242,852	FT. CONTAINMENT (14,500 FT. AROUND EXXON VALDEZ)
<u>152,010</u>	FT. ABSORBENT
394,862	FT. TOTAL DEPLOYED

II. AVAILABLE

40,900	FT. CONTAINMENT
<u>70,595</u>	FT. ABSORBENT
111,495	FT. TOTAL AVAILABLE

Jim Long
7-2386



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

DATE : ~~April 20, 1989~~ 6 May 1989
TO : DISTRIBUTION R
FROM : VADM Clyde Robbins, Federal On-Scene Coordinator *C. Robbins*
SUBJECT : Organization and Responsibilities for Shoreline Cleanup of the
Exxon Valdez Oil Spill

On April 20, 1989 I issued a memorandum outlining the organizational structure for shoreline cleanup operations for the Exxon Valdez oil spill. At that time I requested comments on the structure I had proposed.

In the past week I have received a number of suggestions for improvements and we have had the opportunity to further define the procedures that will be followed. The revised plan is included in the enclosure.

DISTRIBUTION:
EXXON

Alaska Department of Environmental Conservation
Alaska Department of Emergency Services
Alaska Department of Natural Resources
Alaska Department of Fish and Game
Chugach Alaska Corporation
Cordova District Fishermen United
Department of Agriculture - Forest Service
Department of Interior - Fish and Wildlife Service
Department of Interior - National Park Service
National Oceanic & Atmospheric Administration
U.S. Environmental Protection Agency
Multi-Agency Committee - Seward
Multi-Agency Committee - Homer
Multi-Agency Committee - Kodiak

**ORGANIZATION AND RESPONSIBILITIES FOR
SHORELINE CLEANUP OF THE
EXXON VALDEZ OIL SPILL**

April 30, 1989

CONTENTS

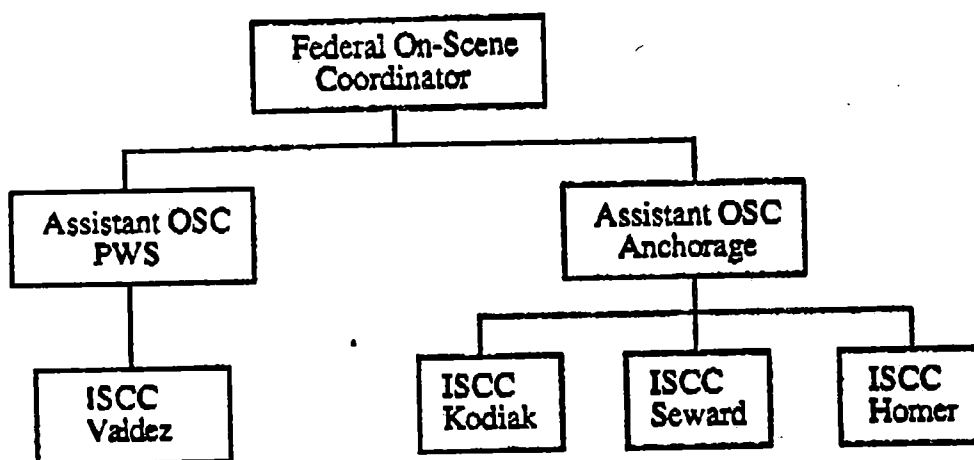
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2. Sector Map	2
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4. Shoreline Cleanup Operation Protocol.....	4
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INTRODUCTION

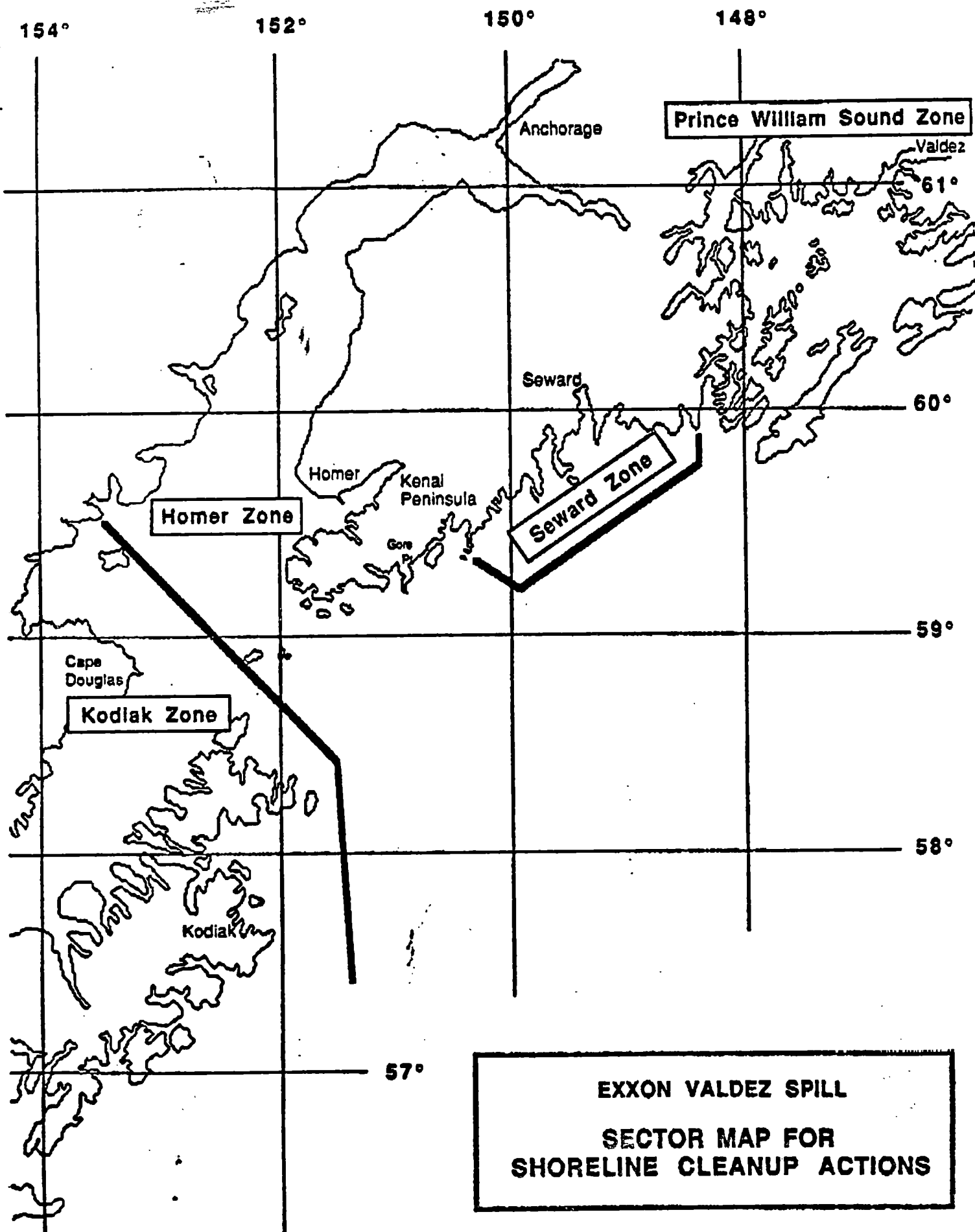
September 15, 1989 has been established as the completion date for cleanup of the Exxon Valdez oil spill. The spill has covered several hundreds of miles of Alaskan coastline and affected a variety of ecological and cultural resources.

Because such a vast area is involved, and because a number of municipalities are involved, I have decided to divide the area into four sectors: Valdez (Prince William Sound), Seward, Homer, and Kodiak. The chart shown on the following page shows these sectors. Another justification for dividing the areas in this manner is to insure that local concerns are addressed and that cleanup in each area goes as quickly as humanly possible.

In order to meet the extensive coordination requirements associated with the approval process, we will have four Interagency Shoreline Cleanup Committees (ISCC's) which will provide advice to the Federal On-Scene Coordinator (FOSC) on cleanup matters.



These committees, for the most part, already exist. Part 3 of this document provides the mission and membership of the committees. Membership on the committees may be altered as necessary, but I want to insure that all parties with a significant interest are represented. I particularly want to hear the voices of the native Alaskans in those sectors where they have an interest.



INTERAGENCY SHORELINE CLEANUP COMMITTEE CHARTER

The Interagency Shoreline Cleanup Committee (ISCC) is an advisory committee to the Federal On-Scene Coordinator.

MISSION

Identify issues and make recommendations to the FOSC to expedite shoreline cleanup:

1. Evaluating general shoreline cleanup procedures and plans;
2. Establishing priorities for cleanup;
3. Reviewing and establishing acceptable cleanup practices;
4. Recommending approval of shoreline cleanup plans; and
5. Evaluating the effectiveness of cleanup operations.

MEMBERSHIP

Land Managing Agencies

Department of Agriculture - Forest Service
Department of Interior - National Park Service - Fish and Wildlife Service
Alaska Department of Natural Resources

Resource Agencies

Alaska Department of Environmental Conservation
Alaska Department of Fish and Game
Department of Interior - Fish and Wildlife Service
National Oceanic and Atmospheric Administration
US Environmental Protection Agency

Native Corporations

Other Interested Parties

Exxon
Local Government
Fisheries Associations
Recreation Associations
Others

SHORELINE CLEANUP OPERATION PROTOCOL

The flowchart shown in attached figure outlines the process to be followed in planning, executing and ultimately certifying the successful cleanup of shoreline contamination from the Exxon Valdez oil spill. The major steps of this process are:

Establish Shoreline Cleanup Priorities

This activity involves determining critical resource areas, sensitive time periods and the degree of oiling of various segments of the impact area. A synthesis of these factors results in a generalized statement of priorities which may be evaluated in the context of manpower and equipment constraints, weather constraints, etc. This activity will be performed by the Interagency Shoreline Cleanup Committee (ISCC).

Conduct Pre-Cleanup Evaluation

Shoreline pre-cleanup evaluations, or "preassessments", will be conducted to evaluate the extent of shoreline oil as well as the nature and sensitivity of ecological and cultural resources. On those shorelines in which mechanical cleanup is unnecessary, and thus the threat to ecological or cultural resources is minimal, simplified "preassessment" procedures are established to expedite the cleanup effort. This activity will be performed by Exxon, supplemented on a case-by-case basis by representatives of state and Federal agencies, native corporations or other qualified individuals.

Prepare Shoreline Cleanup Work Order

For heavily-oiled shorelines, a work order is prepared by Exxon which summarizes recommended cleanup activities, priority considerations within the shoreline segment, and ecological and archaeological constraints. The work order is reviewed by the State Historic Preservation Officer and the Interagency Shoreline Cleanup Committee.

For cleanup activity involving lightly oiled shorelines where mechanized cleanup is unnecessary, a simplified work order is prepared by Exxon for approval by the Federal On-Scene Coordinator. The State Historic Preservation Officer is notified that action will take place.

Cleanup Operations

The Federal On-Scene Coordinator will make the final decision to approve or disapprove the work order.

If the work order is approved, Exxon field operations may commence with oversight from USCG/ADEC. An interagency evaluation team will provide advice and assistance to the oversight team on technical matters.

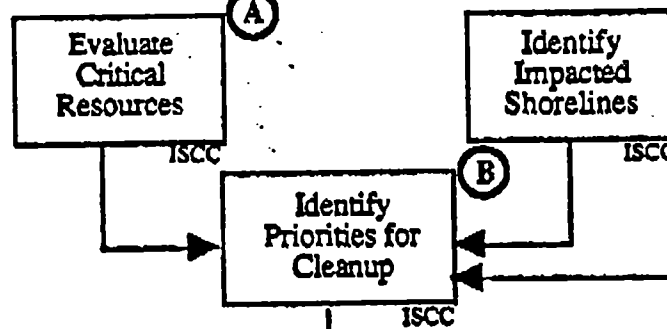
Cleanup Certification

Exxon will request an interagency review of cleanup effectiveness when Exxon is confident that cleanup is complete for a particular shoreline segment.

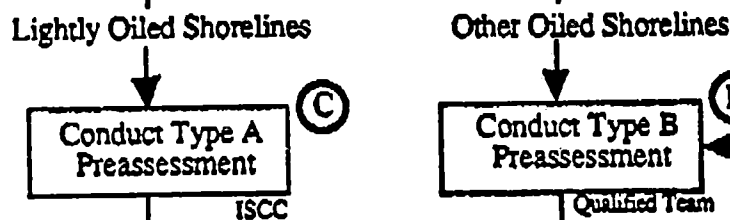
The Federal On-Scene Coordinator, in consultation with the ISCC, will make the final determination that Federal involvement in a specific shoreline segment under the National Contingency Plan is complete.

SHORELINE CLEANUP OPERATIONS PROTOCOL

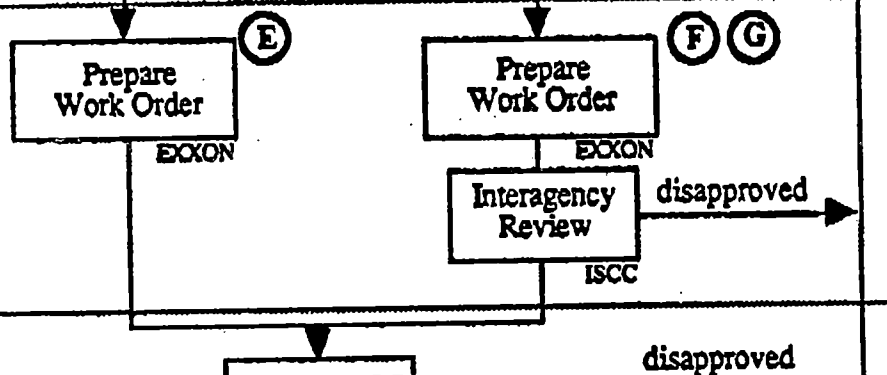
**Establish
Shoreline
Cleanup
Priorities**



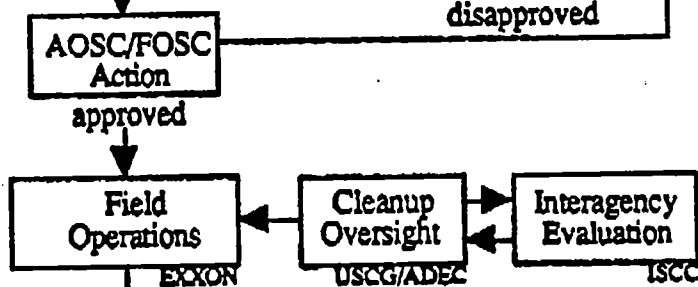
**Conduct
Pre-Cleanup
Evaluation**



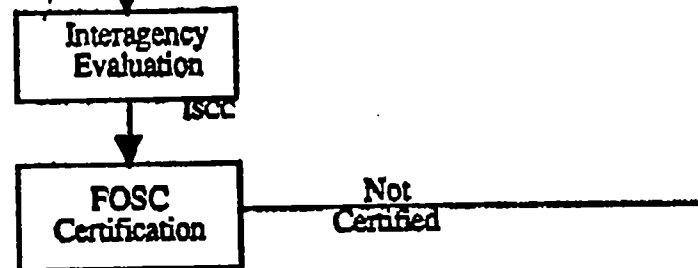
**Prepare
Shoreline
Cleanup
Work Order**



**Cleanup
Operations**



**FOSC
Cleanup
Certification**



ISCC - Interagency Shoreline Committee
FOSC - Federal On-Scene Coordinator
AOSC - Assistant On-Scene Coordinator

TAB A

GUIDELINES FOR THE ASSESSMENT OF CRITICAL RESOURCES

OBJECTIVE

These guidelines provide a mechanism for identifying critical resources that may be affected by shoreline cleanup operations. Critical resource information is an important consideration in establishing shoreline cleanup priorities for areas affected by the Exxon Valdez oil spill. Exxon is responsible for implementing cleanup activities. The Interagency Shoreline Committee should identify critical resources for their area of responsibility, making modifications as more information becomes available.

Maps should be prepared that highlight the most sensitive resources during the spring and summer. These maps should be updated with input from all agencies responsible for critical resources affected by the spill. Areas that may be harmed due to presence and actions of clean-up crews should be pinpointed. These areas may be so sensitive that the presence and actions of clean-up crews could have more detrimental effects than the presence of oil.

CRITICAL RESOURCES

Anadromous Fish Streams

Critical anadromous fish streams are defined as those that produce at least 60% of the fishery for a district. Both the stream and adjacent estuarine areas where the outmigrating pink salmon fry concentrate in shallow water should be identified. In this case, cleanup should not be conducted until the fry have outmigrated and should be completed by the time the fish return.

Herring Spawning

Priority areas should be the most productive, based on the last few years' surveys. Herring spawning began in late March. Herring spawn primarily on the nearshore kelp and eelgrass.

Hatcheries

The location of fish hatcheries.

Pink Salmon Fry Remote Release Areas

Release areas for salmon fry that are away from fish hatcheries.

Commercial Fishing Areas

The following commercial fishing areas may be identified as high priority: 1) concentrated purse seine/gill net areas where fishermen deploy nets close to shore, and 2) purse seine hook-offs, which include both individual points and areas of numerous points.

MAY - 7 - 89 SUN 2:12

TAB A (continued)

Marine Mammal Haulout and Pupping Areas

Large colonies of sea lions and harbor seals. These areas usually coincide with major pupping areas, with pupping occurring from May to June. Cleaning of these areas should be completed prior to pupping. There should be no cleanup activities in these areas during the pupping season.

Waterfowl Concentration Areas

Major waterfowl staging area should be identified. Major shorebird areas of concentrated use should identified; as areas are identified, they will be high priority for cleanup.

State Marine Parks

Recreational Areas/Forest Service Cabins

High-use recreational tent sites and anchorages. USDA National Forest Service cabins are also included. Their value as a social resource necessitates their inclusion.

Privately Developed Lands/Facilities

These areas include private residences, both seasonal and year-round and resource production including timber and tourism.

Research Natural Areas

The U.S.D.A. National Forest Service is developing a designated Research Natural Area. Other areas may be designated in the future, particularly to monitor for recovery without cleanup.

High Subsistence Value Areas

Areas heavily used by native villages for subsistence fishing and hunting. There may be mink and otter trapping trails along the shoreline in these areas as well.

Seabird Nesting Colonies

Major seabird nesting colonies may be designated as high priority for protection.

TAB B

PRIORITY SHORELINE SELECTION METHOD

Introduction

This Priority Shoreline Selection Method is intended to allow shoreline segments to be ranked according to their priority for cleanup. Rank is based on the degree of oiling and the presence of ecological and social resources. Critical resources include those indicated in Tab A (Guidelines for the Assessment of Critical Resources) and others that may be identified in a local region. Important time periods, like salmon spawning and seal pupping, should be considered. Site-specific conditions may justify exceptions to rankings produced using this method.

This method is not intended to produce an absolute ranking of cleanup priorities. Such a ranking is not possible because of changes in the degree of shoreline oiling, weather conditions, and logistical constraints. The method is intended to allow advance planning for the cleanup of high priority shorelines. The placement of a particular shoreline segment in a class should be re-evaluated as new information becomes available on the degree of oiling and the presence of critical resources. This re-evaluation should take place 48 to 72 hours in advance of cleanup equipment deployment to new areas. As the probability for new shoreline oiling decreases, advance cleanup operations planning should extend further into the future.

Cleanup should begin with the highest ranked shorelines to minimize re-suspension of oil that could contaminate new shoreline segments and to minimize resource impacts. Alternatives should be developed to allow cleanup to continue during unfavorable weather conditions and other unforeseen contingencies. The first priority is to clean the most sensitive, heavily oiled shorelines.

Method

Shoreline segments are classified into four classes according to the degree of oiling and the presence of critical resources.

Class 1	Oil Contamination: Variable Resources: Oil sensitive resources with critical time constraints (i.e. pinniped haulouts near pupping season)
Class 2	Oil Contamination: Heavy A. Resources: Present B. Resources: Absent
Class 3	Oil Contamination: Moderate A. Resources: Present B. Resources: Absent
Class 4	Oil Contamination: Low A. Resources: Present B. Resources: Absent

TAB C

SHORELINE CLEANUP PRE-ASSESSMENT TYPE A - LIGHTLY OILED SHORELINES

If a shoreline is lightly oiled and the cleanup meets the following conditions then a Type A shoreline pre-assessment is conducted.

Conditions:

1. Cleanup consists of collecting tarballs and other lightly oiled debris.
2. Collection of tarballs and debris will be done by hand. No mechanical devices or methods will be used.
3. Surface disturbance, specifically the digging of holes or trenches, is prohibited.
4. Supervisors will insure that workers do not go beyond the immediate cleanup area within the oil impacted zone.
5. If any archaeological sites or artifacts are discovered during this activity, they must be remain undisturbed and the Exxon cultural resource program director and the State Historic Preservation Office notified as soon as possible.
6. No cleanup will be conducted on fine sand, mud flats, salt marshes, or the intertidal course of streams.

Procedure:

1. Interagency Shoreline Committee contacts the State Historical Preservation Officer for a finding of No Effect.
2. Information on the shoreline segments under consideration is documented on the Type A Shoreline Oil Evaluation Form (attached) in addition to a map of the effected area. This information is tabulated for each shoreline segment of oiled shoreline. The Shoreline Committee may stipulate constraints for use by cleanup crews and cleanup evaluators.
3. A Shoreline Cleanup Work Order is completed by Exxon and forwarded to Federal On-Scene Coordinator (for Prince William Sound shorelines) or to the Assistant On-Scene Coordinator's sector representative (for shorelines outside Prince William Sound). The Assistant OSC will forward the preassessment to the Federal On-Scene Coordinator to allow parallel review with Exxon in Valdez.

TAB D

SHORELINE CLEANUP PRE-ASSESSMENT TYPE B - OTHER OILED SHORELINES

If a shoreline is more than lightly oiled a Type B shoreline pre-assessment is conducted.

Procedure:

Shoreline oil, ecological, and cultural resource evaluations are conducted for each shoreline segment by a three person team comprised of an archaeologist, biologist, and an oil/geology specialist. The team identifies site specific sensitivities, degree of oiling, and cleanup procedures and constraints for implementation by cleanup crews. This information is used to develop a cleanup plan that ensures the protection of critical resources.

Information on each shoreline segment evaluated is documented with Shoreline Oil Evaluation, Ecological Evaluation, and Cultural Resource Evaluation forms (attached) in addition to map and photographic documentation. This information is tabulated for each shoreline segment of oiled shoreline and the Evaluation Team Leader stipulates the cleanup procedures and constraints for use by cleanup crews and cleanup evaluators.

A Shoreline Cleanup Work Order is completed by the Evaluation Team Leader.

Qualifications:

Archaeologist:

The Secretary of the Interior's Standards for Archaeology as identified in Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. The State Historic Preservation Officer recommends that in addition, the archaeologist have regional experience appropriate to the project.

Lead Biologist:

PhD/Masters in Marine Intertidal Ecology
Five years experience in Alaska
Five years oil pollution experience

Team Biologist:

Masters in Marine Intertidal Ecology
Experience in Alaska
Three years pollution experience

Oil Spill Specialist:

Three-five years oil spill experience
Masters/BS in Geology or Geography
Experience in Alaska
Experience in cleanup procedures and implementation

(Developed from Exxon's Shoreline Cleanup Pre-Cleanup Evaluation Process April 25, 1989)

TAB E

TYPE A SHORELINE CLEANUP WORK ORDER

Date: _____ Shoreline Segment: _____

Location: (Attach map) _____

ADEC No. _____ Shoreline Assessment Date: _____

Recommended Cleanup Activity(ies):

4

Priority Considerations:

Ecological Constraints (from site survey):

Archaeological Constraints:

If any archaeological or historical sites or artifacts are discovered during the cleanup activity, they must remain undisturbed and the Exxon archaeologist C. Mobley contacted (as per procedures in the "Guideline for Shoreline Cleanup") and the State historic Preservation Office notified as soon as possible.

Submitted by: _____
Exxon

Date: _____

State Historic Preservation Officer Telephone Approval (Required)

Date: _____

Approved: _____
Assistant OSC Western Alaska (If appropriate)

Date: _____

Approved: _____
Federal On-Scene Coordinator

Date: _____

TAB F

TYPE B SHORELINE CLEANUP WORK ORDER

Date: _____ **Shoreline Segment:** _____

Location: (see map) _____

ADEC No. _____ **Shoreline Assessment Date:** _____

Recommended Cleanup Activity(ies):

Priority Considerations:

Ecological Constraints (from site survey):

Archaeological Constraints (from site survey):

Submitted by: _____
Exxon

Date: _____

Recommend Approval: _____
State Historic Preservation Officer

Date: _____

Recommend Approval: _____
Interagency Shoreline Committee Representative

Date: _____

Approved: _____
Federal On-Scene Coordinator

Date: _____

-TAB G
SHORELINE EVALUATION FORMS

[revised 17 Apr 89]

SHORELINE OIL VALUATION

Date: ____/____/89

Observer: _____

Time: ____h ____m

Weather: Sun/Cloud/Rain/Snow/Fog

LOCATION

LOCATION _____

SITE _____

LOCATION PREFIX _____

SEGMENT NUMBER _____

LATITUDE: 6 ____d ____m ____s

LONGITUDE: 147 d ____m ____s

LENGTH OF SHORELINE SEGMENT: _____m

ACCESS: Foot/Vehicle/BOat/Barge/HELio/Float Plane

SHORELINE:

SHORELINE CHARACTER:

BEach/SPit/Cove/____/____/

Wave Exposure: High/Med/Low

Rock Y/N & ____ Vertical/High Angle/Low Angle

SEDiment Y/N & ____ Types: B / C / P / G / S / M / R

Strand Line Y/N Algae/Debris/Logs

OIL

LOCATION OF OIL: SU / SP / H / M / L

CONTINUOUS: Y/N WIDTH OF BAND: _____m % of Segment _____

PATCHY: 10/20/30/40/50/60/70/80/90% coverage % of Segment _____

EST. OIL THICKNESS: _____cm EST. OIL PENETRATION: _____cm

POOLED OIL: Y/N "FREE" OIL: Y/N WEATHERED: Y/N

STRAND LINE CLEAN/OILED

SUMMARY OILING: Amount High/Med/Low
Coverage Extensive/Moderate/Light

COMMENTS:

DOCUMENTATION:

MAP/Aerial photo marking segment boundaries _____

VTR: Y/N Tape Number(s) _____

PHOTOGRAPHY: Y/N Roll Number(s) _____

SAMPLE NUMBERS COLLECTED: _____

C:\WP\DATA\SHOREVAL.1

BEACH LEVEL

SUPRATIDAL (+SHWL)
HWL to SHWL
UPPER 1/3 ITZ
MIDDLE 1/3 ITZ
LOWER 1/3 ITZ

SU
SP
H
M
L

SEDIMENT TYPE

BOULDER (> 256 mm)
COBBLE (64 - 256)
PEBBLE (4 - 64)
GRANULE (2 - 4)
SAND (0.06- 2)
MUD (< 0.06)
ROCK

B
C
P
G
S
M
R

Can use multiple entries e.g. C/G/S; in which case the first letter is the predominant sediment type and the following are in decreasing order

KEY

LOCATION PREFIX

NAKED IS
PEAK IS
STOREY IS

NA
PE
ST

ELEANOR IS
INGOT IS
BLOCK IS
ENTRANCE IS
SPHINX IS
DISK IS
KNIGHT IS

EL
IN
BL
EN
SP
DI
KN

SMITH IS
SEAL IS
APPELGATE IS
GREEN IS

SM
SE
AP
GR

LOCATION SUFFIX

A unique number which identifies the distinct segment described in this report.

C:\WP\DATA\SHOREVAL.1

ECOLOGICAL EVALUATION

LOCATION: _____ SITE: _____ OBSERVER: _____

LOCATION PREFIX: _____ SEG. NO.: _____ LENGTH: _____ (M)

DATE: ____/____/____ TIME (HHMM): _____ TIDE HT.: _____ (M)

OILED ZONE: Splash High Medium Low

SUBSTRATUM: Rocks Boulder Cobble Gravel Sand Mud

LIVE BIOTA

Fucus (algae): Patchy Y/N Contin. Y/N Dense Y/N Sparse Y/N None Y/N

Mytilus (Mussels): Patchy Y/N Contin. Y/N Dense Y/N Sparse Y/N None Y/N

Balanus (Barnacles): Patchy Y/N Contin. Y/N Dense Y/N Sparse Y/N None Y/N

Littorina

Patchy Y/N Contin. Y/N Dense Y/N Sparse Y/N None Y/N

Limpets: Patchy Y/N Contin. Y/N Dense Y/N Sparse Y/N None Y/N

OTHER OBSERVATIONS: _____

CLEANUP PRECAUTIONS: _____

MAMMALS: Otters _____ Harbor Seals _____ Sea Lions _____ Whales _____
Other _____

BIRDS: _____

GENERAL OBSERVATIONS: _____

CULTURAL RESOURCE EVALUATION FOR OILED SHORELINE

Date _____ Location _____ Site _____
Location Prefix _____ Segment # _____ Length _____ m
Survey Method: Air _____ (A - indicate on map) _____ Boat (B - indicate on map)
Ground _____ (G - indicate on map)
Known cultural resources (AHRS #) _____ Data Source _____
Oil conditions/beach visibility _____
Width of beach zone surveyed _____ m Tree fringe surveyed _____
Cultural resources observed in beach zone (AHRS code) _____
Cultural resources observed in tree fringe (AHRS code) _____
General observations justifying survey method and segment's site probability:
Shore Profile _____
Fresh Water Sources _____
Sea Exposure _____
Safety/Access _____
Probability of undiscovered sites in beach zone (circle one) 1 2 3 4 5
Monitoring during cleanup needed yes/no Collection yes/no
Photos: Color Roll # _____ Frames _____
B/W Roll # _____ Frames _____
Observer(s) _____
Time survey started _____ Time survey ended _____
Cultural resource considerations/restraints:

C:\WP\DATA\CULTURED.SHO

Contact Tom Brennan: 907-265-8312

- 914 -

ANCHORAGE, ALASKA, April 25, 1989--Alyeska Pipeline Service Company today announced acquisition of three large emergency response vessels to complement its oil spill response capability. The vessels are being modified for duty in Prince William Sound and will be on site on or about May 15, the Company said. The ships are part of a massive build-up of equipment from around the world being coordinated by Alyeska and its Owner Companies.

Alyeska said the 200-plus foot vessels will escort outbound loaded tankers within Prince William Sound.

(more)

The "Biehl Trader" "Biehl Traveler" and "Heritage Service" are nearly 210 feet long each. They have 7,500 horsepower engines and deck space for storage of response equipment. The vessels will be equipped to tow a vessel in distress as well as immediately deploy oil spill recovery equipment in the event of a spill.

Alyeska said acquisition of these vessels is the latest step in its ongoing commitment to greatly improve its capacity to recover oil in the event of a future spill. The Company expressed confidence that the objective can be met, saying that more detailed proposals will be submitted to the Alaska Department of Environmental Conservation (ADEC) within one week.

Alyeska said employment of emergency response vessels will make it possible to commence booming and oil recovery operations around a stricken vessel in Prince William Sound within minutes of any future spill. It said plans being finalized now would also assure on site deployment of all response gear within a matter of hours. Specific equipment to be placed on emergency response vessels as well as the plan for bringing additional manpower and equipment to the scene of any future spill will be included in the submission to ADEC, the Company said.

(more)

Alyeska said progress is being made to implement drug and alcohol testing for crews of all tankers visiting Valdez. It stated that proposals to further improve navigational aids in Prince William Sound are proceeding. The Company said it has formed a dedicated around the clock oil spill response team at its Marine Terminal and has re-supplied the Terminal with equipment called for in its Oil Spill Contingency Plan.

Alyeska has also extended tug escorts and pilotage for vessels transiting Prince William Sound and moved to further improve communications through the Sound. Substantial quantities of additional equipment have been arranged to improve oil spill containment and recovery capabilities. Included in this equipment are large amounts of heavy duty sea-boom and a high capacity skimmer called a Wier Boom. The Company said an Owner task force is looking for further steps which might be taken to improve prevention and response capabilities in Prince William Sound.

Alyeska said acquisition and deployment of oil spill prevention and response equipment is the first step in what has to be a multi-phase approach to improving protection of the marine environment in Alaska.

(more)

The Company stated that the best equipment in the world will not successfully control a major spill unless management systems are in place to respond efficiently and effectively.

The Company said it was committed to working jointly with industry and government to address the regulatory and priority-related lessons learned from the "Exxon Valdez" incident. If we ever again face the need to respond to a major spill, issues ranging from immediate use of dispersants to vessel booming, protection of environmentally sensitive areas and use of local resources must be pre-agreed, Alyeska said.

We intend to work with all involved organizations to ensure that decisive action steps can be taken promptly in the event of another incident. Working together with State and Federal agencies now will make that possible, Alyeska said.



BP AMERICA

BP America Inc.
1776 I Street, N.W., Suite 1000
Washington, DC 20006

X-RAYED

The Honorable John H. Sununu
Chief of Staff to the President
The White House
Washington, D.C. 20500

Please deliver to NEOB G-1.

DS-9902-B

Photocopy-Preservation



THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590
April 26, 1989

100 APR 27 11 00

INFORMATION

MEMORANDUM FOR THE PRESIDENT

FROM: SAMUEL K. SKINNER 
SECRETARY OF TRANSPORTATION

SUBJECT: OIL SPILL CLEAN-UP EFFORT

I. SUMMARY

Attached is the Coast Guard Incident Memo for April 26, 1989. Weather in Prince William Sound and the Gulf of Alaska continues to impede both clean-up efforts and surveillance activities. Skimming operations are at a virtual standstill, but the time is being used to do needed maintenance and to offload oil and kelp. Skimmers in the Gulf of Alaska are being gathered in the Nuka Passage where large concentrations of oil have accumulated.

II. DISCUSSION

High seas and winds over the past several days have slowed skimming and cleaning operations. Significant snowfalls have been reported in the Prince William Sound and visibility continues to be poor.

Ten day Jones Act waivers have been granted for one Canadian and two French skimmers; and a Canadian supply vessel, the Arctic Tuktu, was granted an additional twenty day waiver. Exxon anticipates recovering the remaining oil on the water within the next 10-14 days, so there should be fewer requests for waivers of the Jones Act.

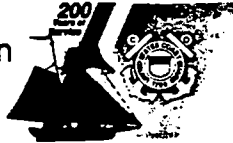
Skimming operations over the past few days have been plagued by weather and the continuing problem of off-loading oil-laden kelp. The Soviet skimmer, Vaydaghabsky, has been unable to keep its skimming screen from clogging with kelp. Modifications have been made to the screen, and the vessel will be skimming in the Nuka Passage area.

News coverage indicated that Exxon may have underestimated the size of the spill by a million barrels. The Coast Guard indicates that estimating the quantity of lost oil is an inexact science - for example, even after the Exxon Valdez was off-loaded, 18,000 gallons remained on the interior walls of the hull. More definitive estimates of the oil that was released will be prepared.

cc: The Honorable John Sununu
David Bates
Richard Breeden

U.S. Department
of Transportation

United States
Coast Guard



Commandant
United States Coast Guard

Washington, D.C. 20593-0001
Staff Symbol:
Phone:

COMMAND CENTER INCIDENT MEMO

VALDEZ - 28
26 APRIL 1989

INCIDENT: MAJOR OIL SPILL, VALDEZ, ALASKA
DATE OCCURRED: FRIDAY, 24 MARCH 1989
SOURCE: T/S EXXON VALDEZ
NATIONALITY: U.S.
SUBSTANCE: ALASKAN NORTH SLOPE CRUDE OIL
AMOUNT SPILLED: 250,000 BBLS (10.5 MILLION GALLONS)
SPECIAL FORCES: NATIONAL STRIKE FORCE
NOAA SSC
NAVY SUPSAL
PIAT
ERT
LOCATION: PRINCE WILLIAM SOUND
OSC: MSO VALDEZ

SUMMARY:

OIL POLLUTION SURVEY: THERE WERE NO OVERFLIGHTS OF PRINCE WILLIAM SOUND. EXTENSIVE SURVEILLANCE OF ALL AREAS SCHEDULED FOR 26 APR WEATHER PERMITTING.

WESTERN ALASKA - SHEEN AND MOUSSE PATCHES SIGHTED FORM EAST SIDE ROCKY BAY TO CHUGACH BAY, WITH HEAVY CONCENTRATIONS IN MOUTH OF WINDY BAY AND SOUTHERN PORTION OF CHUGACH BAY. SCATTERD SHEENS EXTEND UP TO KOYUKTOLIK BAY. STREAMERS OF LIGHT MOUSSE SOUTH AND SOUTHEAST OF BARREN ISLANDS. KODIAK COMMAND POST RECEIVING MANY REPORTS OF MINOR ISOLATED PIE PLATE SIZE MOUSSE PATCHES IN KODIAK AREA AND ON KATMAI NATIONAL MONUMENT COAST, HH3 CHECKING OUT REPORTED SIGHTINGS.

VESSEL ANCHORAGED: T/V EXXON VALDEZ REMAINS ANCHORED OUTSIDE BAY, NAKED ISLAND IN POSITION 60-38.0 N, 147-28.8W. DRILLING OF STOPPER HOLES CONTINUES. SKIMMING OF FORE PEAK TANK TO A .25 INCH OIL LAYER HAS BEEN COMPLETED. BOOMING AND POCKETING OF OIL IN TANK 1C HAS BEGUN IN AN EFFORT TO REDUCE OIL ON WATER SURFACE TO SHEEN. DECK RUNOFF IS CARRYING OIL SHEEN OVERBOARD DUE TO VERY HEAVY RAINFALL. SORBENTS BEING USED ON DECK AND IN WATER TO RECOVER ALL OIL SHEEN.

SKIMMING: PRINCE WILLIAM SOUND HAD LITTLE SKIMMING OPERATIONS DUE TO ADVERSE WEATHER. SKIMMERS STAGED IN UPPER PASSAGE, MAIN BAY, ESHAMY BAY, AND NORTHWEST BAY. M/V RED JACKET ENROUTE CGC IRIS WITH CG SKIMMING BARRIER FOR STAGING.

WESTERN ALASKA - ALL SKIMMERS WITH EXCEPTION OF MR. CLEAN III ATTEMPTING TO GET TO DIVISION BAY, NUKA PASSAGE TO SKIM OIL/MOUSSE CONCENTRATED IN THAT LOCATION. USN SUPSALV ARRANGING TO REMOVE FULL DRACONE IN THE VICINITY OF NUKA BAY. EXXON REP NOW ABOARD CGC MORGENTHAU. VECO REP ABOARD F/V EAGLE ENROUTE NUKA BAY FROM SEWARD.

SHORELINE OPERATIONS: PRODUCTIVE OPERATIONS REPORTED FROM CG MONITORS IN NORTHWEST BAY. NO ESTIMATE RECEIVED WITH REGARD TO AMOUNT OF OIL REMOVED. SHORELINE COMMITTEE APPROVED THE PLAN FOR THE PINNIPED HAULOUT BLOCK WHICH INCLUDES AGNES, LITTLE SMITH AND LITTLE GREEN ISLANDS.

WESTERN ALASKA - HOMER MAC GROUP WANTS TO CHANGE BOUNDARIES FOR SHOELINE CLEANUP REQUIREMENTS AS FOLLOWS; BOUNDARY BETWEEN SEWARD AND HOMER GROUPS SHOULD BE PETROF PT (BOUNDARY BETWEEN NATIONAL PARK AND STATE PARK LANDS), BARREN ISLANDS SHOULD BE IN HOMER AREA INSTEAD OF KODIAK AREA. ALL THREE GROUPS WILL DISCUSS AMONG THEMSELVES AND DECIDE ON THESE PROPOSED CHANGES. APPROX 15,000 FT OF BOOM ARRIVED HOMER AND WILL BE DEPLOYED AT AREAS DETERMINED BY HOMER MAC GROUP.

OPERATIONS: INSTALLING OSCAR SYSTEM ABOARD USS JUNEAU WHILE IN PORT. DATA IS BEING ENTERED AS REMOTE TERMINALS ARE INSTALLED AND PERSONNEL TRAINED. O-MAIL PROVIDES A CONVENIENT, INFORMAL METHOD FOR INFORMATION RESPONSE AND HAS RELIEVED SOME OF THE BARRAGE OF PHONE CALLS FOR DETAILS ON THE CLEANUP PROGRESS. THE JOINT COMMUNICATIONS CENTER IS FULLY OPERATIONAL.

FACT SHEET

26 APRIL 89

OIL RECOVERED:	43,000 BBLs
EVAPORATED	84,000 BBLs
BIODEGRADED	12,000 BBLs
BURNED	19,000 BBLs
DISPERSED	12,000 BBLs
PRINCE WILLIAM SOUND	
COLLECTABLE	4,000 BBLs
WIDELY DISPERSED	14,000 BBLs
SHORELINE	36,000 BBLs
GULF OF ALASKA	
OFFSHORE	9,000 BBLs
SHORELINE	7,000 BBLs

VESSELS OFFSHORE:

I. DEPLOYED

6	TANK BARGES, TOTAL CAPACITY	<u>175,000 BBLs</u>
2	SUPPORT BARGES (1 STANDBY)	
9	BERTHING VESSELS	
14	TUGS	
24	LANDING CRAFTS LCM/LCA/LCV	
326	OTHER VESSELS (20'-195')	
85	CDFU	

465 TOTAL DEPLOYED

II. ENROUTE

BERTHING VESSELS

NAME	CAP.	ETA
COLUMBIA	100 BEDS	5/02
BERING TRADER	300 BEDS	5/04
USS MCHENRY	400 BEDS	UNK

BARGES

OIL	2 EA	180 X 50	4/28
SECTIONAL	1 EA	180 X 54	4/26

OTHER

OCEAN FINN	4/27
------------	------

BOOM:

I. DEPLOYED

193,120	FT. CONTAINMENT
91,485	FT. ABSORBANT
14,500	FT. AROUND EXXON VALDEZ
<u>299,105</u>	FT. TOTAL DEPLOYED

26 APRIL 89
WEATHER FORECAST

PRINCE WILLIAM SOUND

WINDS: EAST DIMINISHING TO 15 KNOTS
SEAS: DIMINISHING TO 3 FEET
CLOUD COVER: CLOUDY
PRECIPITATION: RAIN
VISIBILITY:

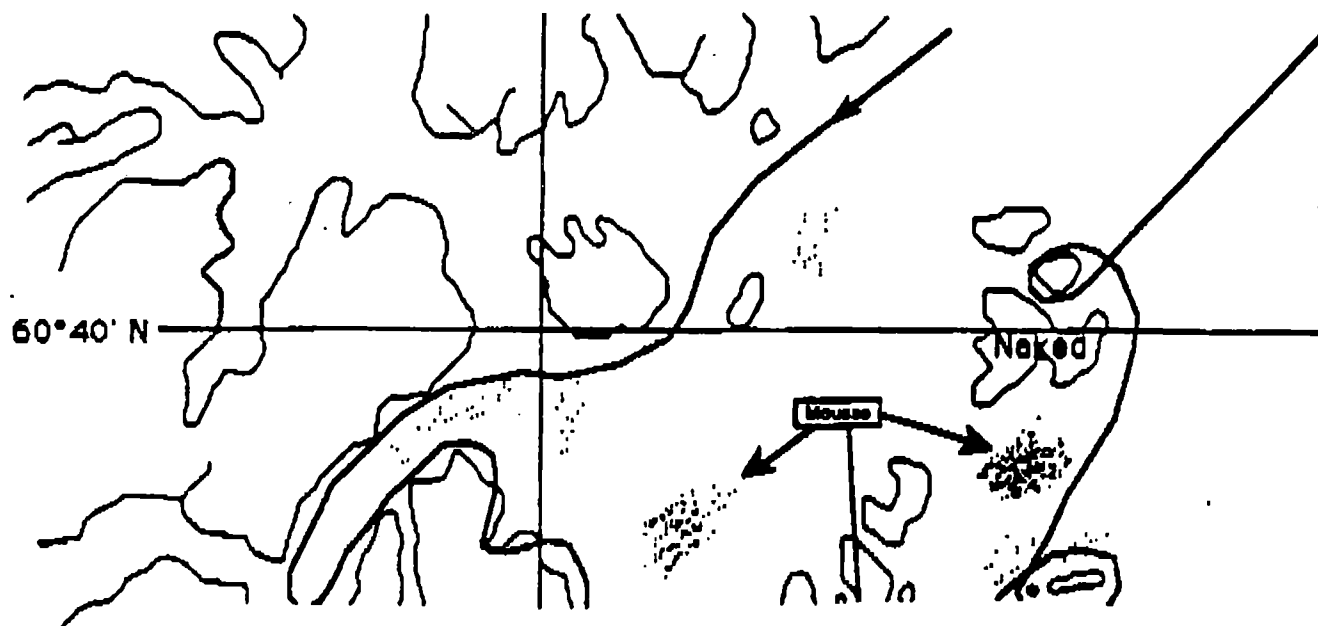
GULF OF ALASKA (CAPE CLEAR TO GORE POINT)

WINDS: GALE WARNING SOUTHEAST 35 KNTS DIMINISHING TO 20
SEAS: 10 FEET DIMINISHING TO 6 FEET
CLOUD COVER: CLOUDY
PRECIPITATION: RAIN

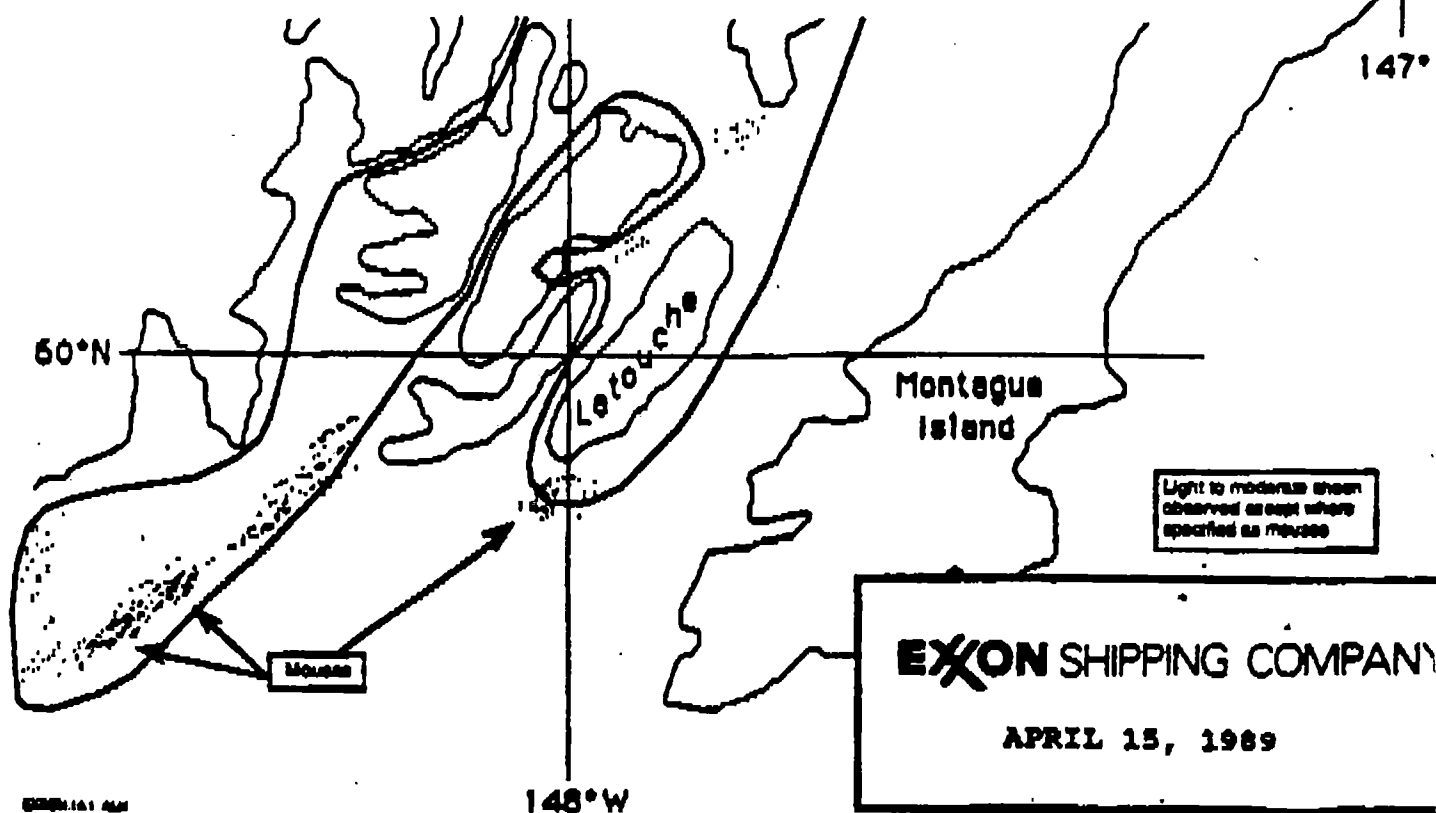
OUTLOOK:

PRINCE WILLIAM SOUND: WINDS CHANGING TO THE EAST DECREASING TO 15 KNOTS.

CAPE CLEAR TO GORE POINT: WINDS CHANGING TO NORTHEASTERLY SPEED TO 20 KNOTS.



**Shoreline Clean-Up Execution Plan
for
Valdez Oil Spill**

 $60^{\circ}20'$ 

SHORELINE CLEAN-UP EXECUTION PLAN
FOR
VALDEZ OIL SPILL

-- TABLE OF CONTENTS --

SECTION A:	KEY ASSUMPTIONS
SECTION B:	SCOPE OF EFFORT
SECTION C:	CLEAN-UP TECHNIQUES & RESOURCES
SECTION D:	PRODUCTIVITY BASIS & FACTORS
SECTION E:	PROJECT TIMELINE
SECTION F:	SUMMARY

SHORELINE CLEAN-UP EXECUTION PLAN
FOR
VALDEZ OIL SPILL

SECTION A: KEY ASSUMPTIONS

- * **Start date:** USCG approvals and agency permits are received immediately to begin initial shoreline clean-up operations.
- * **Permitting Delays:** Permits for future shoreline clean-up operations are received from all involved agencies in a timely manner - no delays.
- * **Clean-up Scope:**
 - No additional oiling/re-oiling will occur.
 - Total area to clean is defined from 4/13/89 ADEC maps plus Exxon estimation of Southern areas not yet mapped by ADEC.
 - Acceptable level of cleaning is achieved by low pressure, cold water wash/float (maximum 3 passes/area).
 - Clean-up operations are conducted within the environmental windows established by agency committees/NOAA.
 - Base plan assumes only low pressure cold water flushing. Alternate plan projects significant productivity increases with warm water and increased pressure.
- * **Downtime:**
 - Weather related: Apr 10%, May 20%, Jun 5%, Jul 5%, Aug 20%, Sep (1st half) 10%, Sep (2nd half) & Oct 80%.
 - Mechanical: 15%
 - No additional productivity/downtime delays are encountered due to interference between onshore/offshore operations, logistics or waste disposal.
- * **Resources:** Number, mix, and productivity of clean-up units are achieved as currently projected.

VALDEZ OIL SPILL

April 14, 1989

	Estimated Volume KB -----	% ---
INITIAL SPILL	240	100
EVAPORATED	84	35
BIODEGRADED	12	5
DISPERSED, NATURAL & CHEMICAL	12	5
OPEN WATER - PWS	30	12
- GULF	40	18
SHORELINE - PWS	30	12
- GULF	10	4
RECOVERED	22	9

SHORELINE CLEAN-UP EXECUTION PLAN

FOR

VALDEZ OIL SPILL

SECTION B: SCOPE OF EFFORT

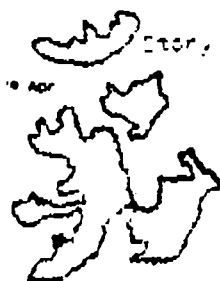
SHORELINE	IMPACTED SHORE	% OPEN SHORE	TOTAL SHORELINE TO BE CLEANED	SHORELINE MILES BY OIL CONTENT		
				HVY	MOD	LG
ADEC DATA:						
Naked Island	9.7	0.17	8.1	4.1		4.1
Ingot Island	15.1	0.05	14.4	1.5	7.2	5.8
Ingot Satellite NNW	1.1	0.25	0.9		.3	.6
Smith Island	9.4	0.60	9.4	7.5	1.0	1.9
Latouche Island	30.9	0.25	23.2	4.6	11.6	7.0
Green Island	13.6	0.05	12.9	3.9	3.9	5.8
Chenega Island	12.7	0.38	8.0	2.4	1.6	4.0
Eleanor Island	28.9	0.13	25.3	12.7	5.1	7.6
Knight Is. Top 1/4	8.5	0.05	8.1	.8	4.9	2.4
Knight Is. Mid 1/4	42.4	0.20	34.0	6.8	10.2	17.0
Knight Is. Lower 1/4	4.3	0.25	3.2		3.2	
Knight Is. Bottom 1/4	31.2	0.35	20.3	8.1	6.1	4.1
Flemming Island	0.5	0.45	0.3			0.1
Point Nowell	6.9	0.45	3.8		1.9	1.9
Point Evans	8.7	0.15	7.2		5.	2.2
Bainbridge Point	0.5	0.40	0.3			0.1
ADEC SUBTOTAL	224.6		179.4	52.6	62.2	64.0
EXXON ESTIMATED:						
Montague Island	15.0	0.20	12.0			12.0
Elrington Island	20.0	0.20	16.0	1.6	6.4	8.0
Evans Island	36.0	0.20	28.8		17.3	11.5
Bainbridge Island	10.0	0.20	8.0			8.0
Contingency	60.8		60.8			60.8
EXXON SUBTOTAL	141.8		125.6	1.6	23.7	100.0
TOTAL PRINCE WILLIAM SOUND	366.4		305.0	54.2	85.9	164.0

1 Apr - 9 Apr 1989

Story I

3 Apr 1989

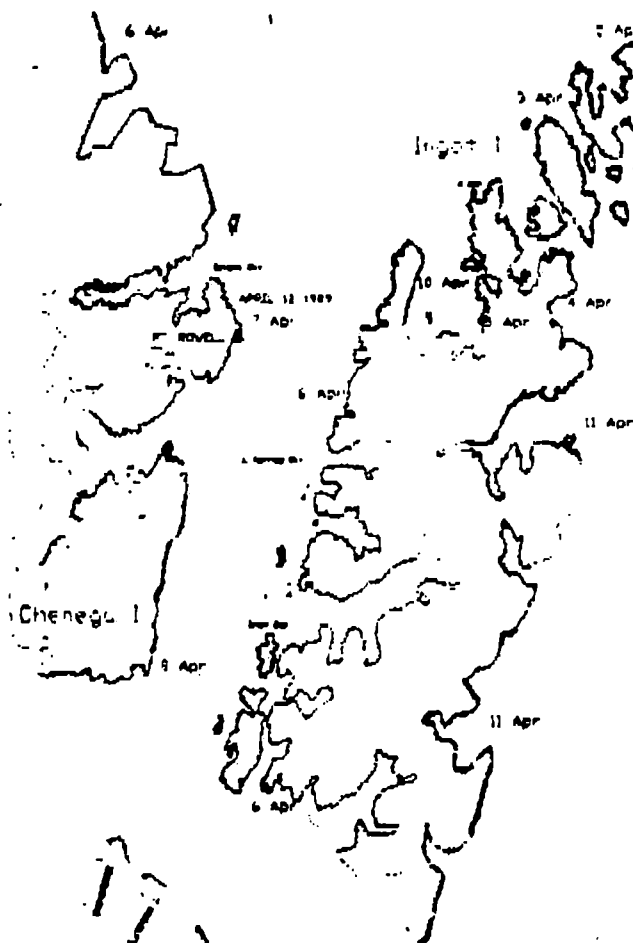
6 Apr



Noted Island

Alaska Off - Shore Impact Survey	
	Heavy
	Moderate
	Light
	No Impact
	Unobserved
Name: ADE/WCC Date: 4/14/89	

Oil Coverage
4 to 11 Apr



Green I

9 Apr

11 Apr

LE-YOUNG

SHORELINE CLEAN-UP EXECUTION PLAN**FOR****VALDEZ OIL SPILL****SECTION C: CLEAN-UP TECHNIQUES & RESOURCES****FLUSH/WASH TECHNIQUE****Method A**

- * Cold water wash
- * Low pressure(< 50 psi)
- * Boom containment
- * Skimmer & physical removal
- * Disposal

Method B

- * Warm water wash(110 F)
- * High pressure(> 100 psi)
- * 2 man vacuum unit
- * 55 gallon drum

Resources - Landing Craft Vessel (1)

- | | |
|----------------------------|-----------------------|
| * 40' Landing Craft Vessel | * 6 Pumps |
| * 2 Work Boats; Crew boat | * 440' hose |
| * Shared berthing ship | * 60' perforated pipe |
| * 500' boom | * 2-2Kw generators |
| * 3 Skimmers | * Heater |
| | * 25 Person crew |

Resources - Barge Unit (1)

- | | |
|----------------------------------|----------------------------------|
| * Barge (min 60'x150') | * Pumps - 802", 406", 404", 403" |
| * Mudcat pumping barge | * 4 Pressure pumps |
| * 2 Work boats | * 500' aluminum header pipe |
| * Tug; 2 landing craft | * 150 Kw generator |
| * Shared/dedicated berthing ship | * Heater |
| * 11,000' boom | * Crew trailer; sea van |
| * 6 Skimmer heads | * 30 Ton hydraulic crane |
| | * 80 Person crew |

(1) See Attachment 1 for schematic.

SHORELINE CLEAN-UP EXECUTION PLAN FOR VALDEZ OIL SPILL

SECTION D: PRODUCTIVITY BASIS & FACTORS

CLEAN-UP TECHNIQUE	PRODUCTION RATE(yds/day)		
	LIGHT	MODERATE	HEAVY
COLD FLUSH/FLOAT - Landing Craft Vessel (LCV)	100	66	50
COLD FLUSH/FLOAT - Barge Unit	400	267	200
WARM FLUSH/FLOAT - Landing Craft Vessel (LCV)	200	133	100
WARM FLUSH/FLOAT - Barge Unit	600	400	300
WASH/VACUUM	10	6	5
WIPE	1	0.6	0.5

WEATHER DOWNTIME FACTORS (1)

APRIL	10 %
MAY	20 %
JUNE	5 %
JULY	5 %
AUGUST	20 %
SEPTEMBER - 1st half	10 %
SEPTEMBER - 2nd half	80 %

PRODUCTIVITY INCREASE FACTORS

APRIL	1.00
MAY	1.05
JUNE	1.10
JULY	1.10
AUGUST	1.10
SEPTEMBER	1.10

FOOTNOTES

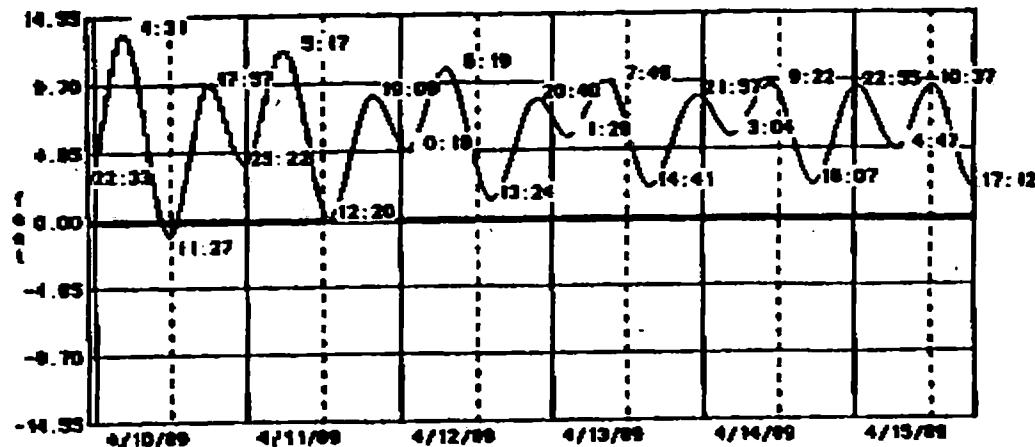
(1) Weather downtime due to high wind.

CLIMATIC IMPACTS

	<u>April</u> <u>2nd Half</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>Sept</u> <u>1st Half</u>	<u>2nd Half</u>
Total Weather Downtime, % (% of Days When No Work Accomplished)	10	20	5	5	20	10	80
Sunlight Hours	16	18	20	20	18	16	15

- Typical based on information obtained from locals with knowledge of offshore weather patterns over 10+ years.
- Downtime caused by high wind/williwaws - limited impact from fog/drizzle/rain.
- Storm season commences mid September - snow season commences in November.
- Diurnal tides limit number of hours when clean up activities can be done effectively.

Aggregate Plot



Start Time: 8U 4/09/89 @ 22:33



REVISED DRAFT

Time Periods When Clean-up Operations Can Occur in Regions In Which Various Oil Sensitive Species Inhabit in Spring and Summer

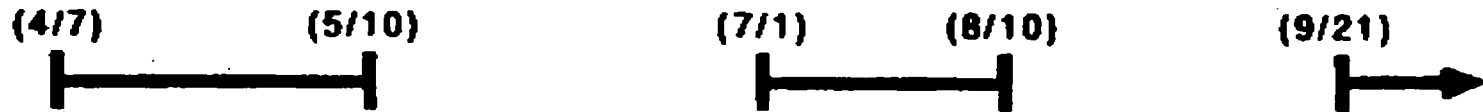
MONTH **April** **May** **June** **July** **August** **Sept.**

RESOURCE

Pink Salmon
(includes remote
release areas)

No cleanup operations will occur in the intertidal areas of anadromous streams.

Pinnipeds
(includes harbor seals
and Stellar Sea Lions)



Waterfowl



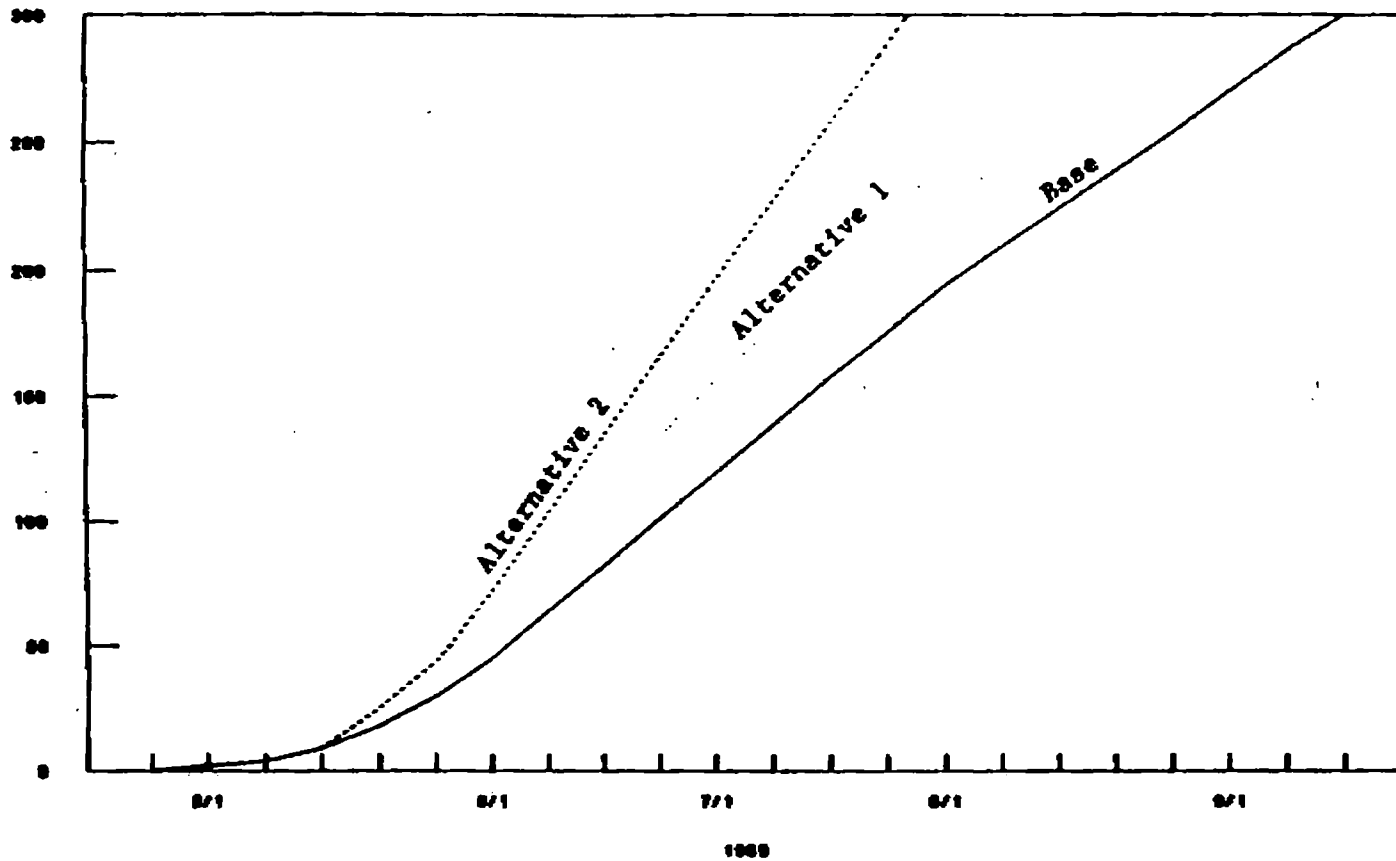
Herring



Shoreline Clean-Up Execution Plan for VALDEZ OIL SPILL

SECTION E: PROJECT TIMELINE

Statistical Miles Cleaned



Base —————

-Cold Flush
-Low Pressure

Alternative 1
Alternative 2 -----

-Warm Flush
-Increase Pressure

Alternative 2 -----

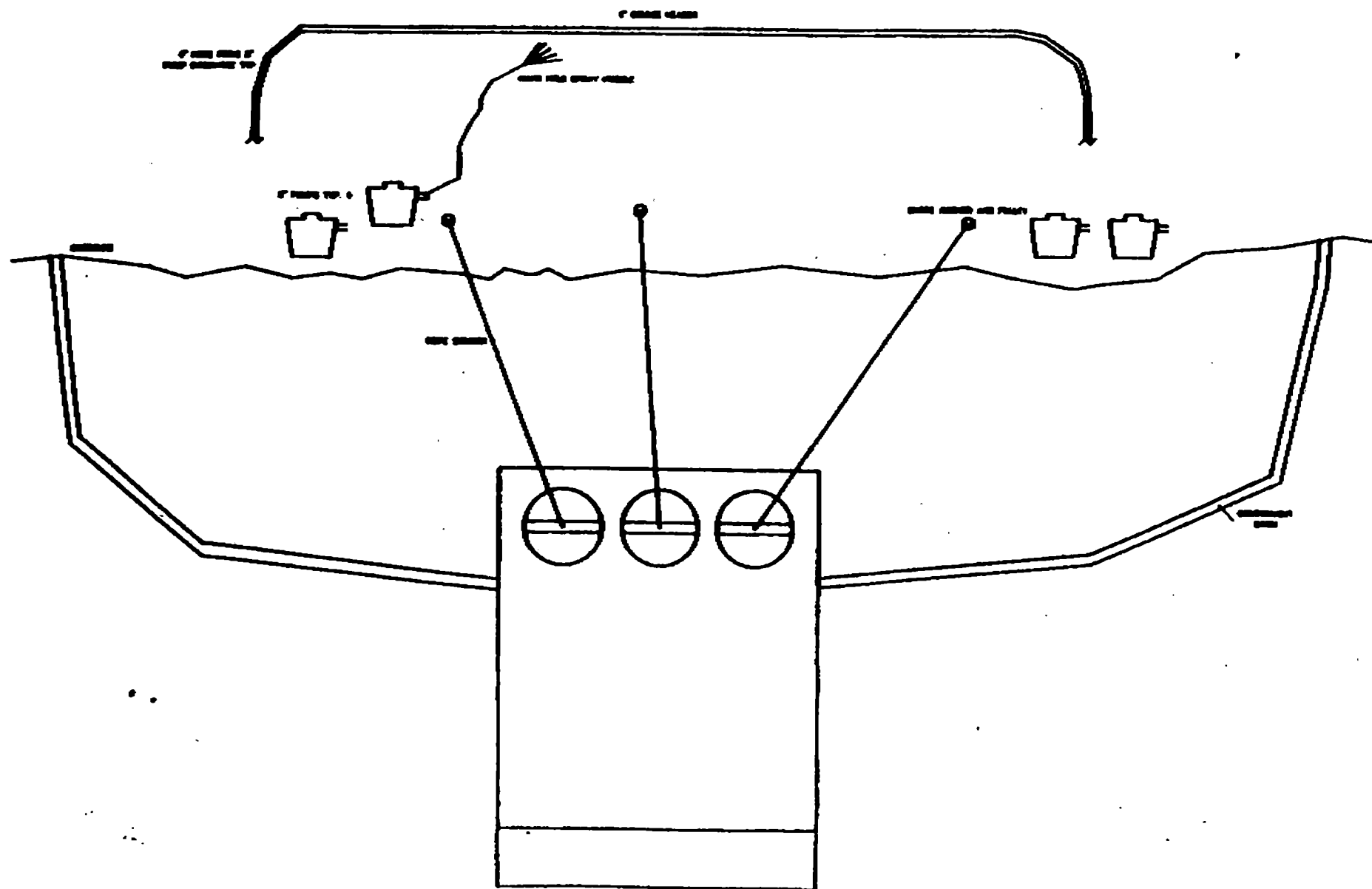
-Warm Flush
-Higher Pressure

SHORELINE CLEAN-UP EXECUTION PLAN
FOR
VALDEZ OIL SPILL

SECTION F: SUMMARY

- * An execution plan has been developed to clean-up approximately 300 miles of contaminated shoreline within Prince William Sound by September 15, 1989.
- * Direct shoreline clean-up resources will peak at approximately 1250 people, 11 barge units & 28 LCV units, 150 utility vessels, and 6 Wash/vacuum units. Support operations will peak at approximately 413 people and 140 vessels.
- * An integrated & cooperative effort will be required between Exxon, contractors, government entities, and environmental agencies to successfully execute the clean-up effort.
- * Exxon will continue to analyze alternative cleaning techniques to increase productivity. Techniques under analysis include warm water flushing with and without higher pressure.
- * Exxon will develop and refine a detailed shoreline clean-up execution plan.

40' LCV FLUSH/FLOAT SYSTEM



40' LCV EQUIPMENT LAYOUT

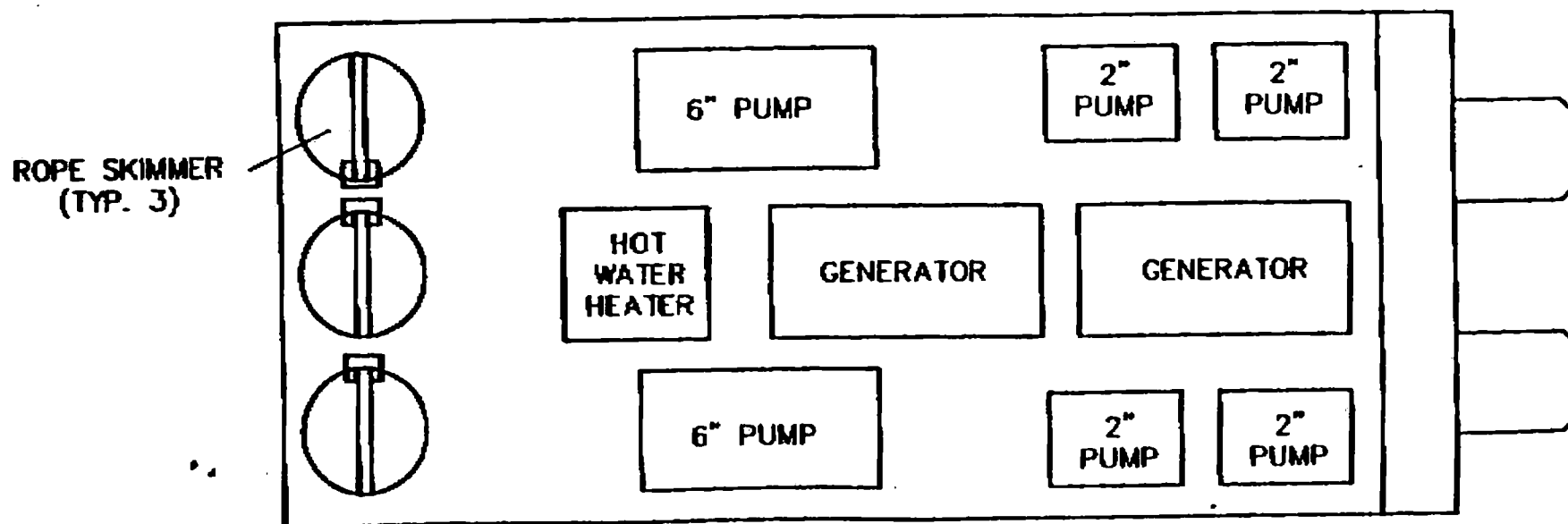
EQUIPMENT

2 ea SKIFFS
 500' BOOM-FLOATING
 3 ea SKIMMERS-ROPE MOP TYPE
 4 ea 2" PUMPS
 2 ea 6" PUMPS
 1 ea CREW BOAT
 1 ea HOT WATER HEATER
 60' 6" DELUGE PIPE

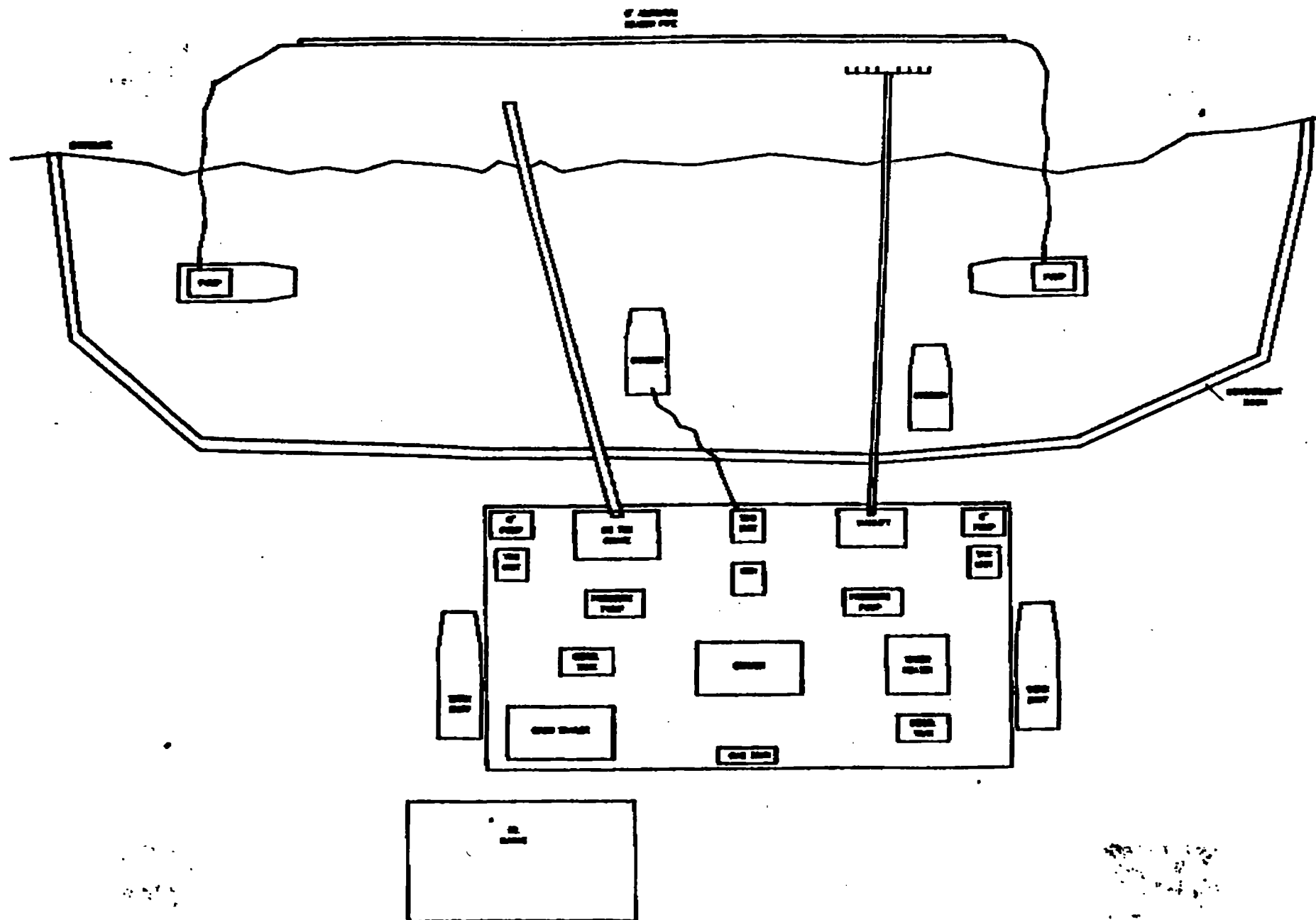
100' 4" H.P. HOSE-DISCHARGE
 200' 2" H.P. HOSE-DISCHARGE
 60' 6" SUCTION HOSE
 80' 2" SUCTION HOSE
 2 ea QUICK CONN. 6"x4" RED.
 2 ea 2 KW GENERATOR
 3 ea 55 GAL OIL CONT.
 2 ea SEINERS

BOAT - 6 MEN
 MECHANICAL - 1 MAN
 LABORERS - 15 MEN
 FOREMAN - 1 MAN
 LCV OPERATORS - 2 MEN

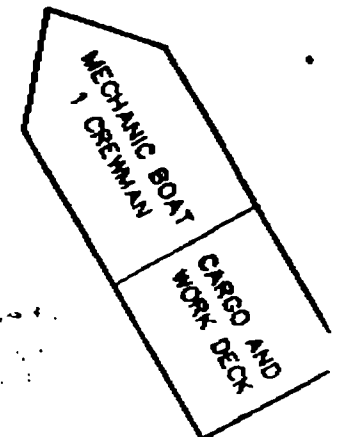
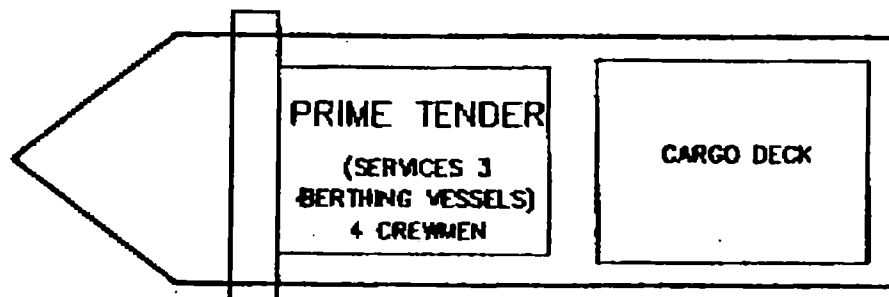
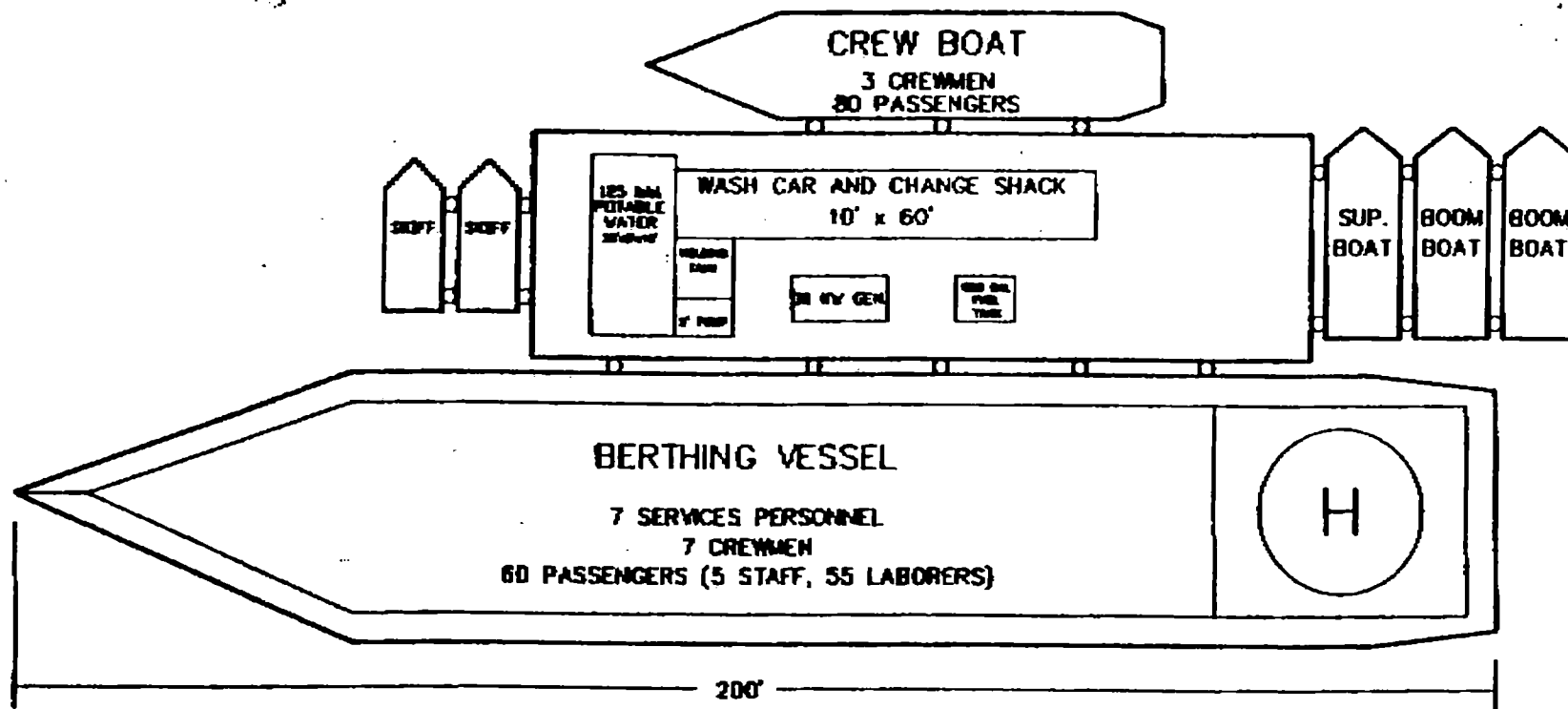
25 TOTAL



OIL RECOVERY BARGE SYSTEM



SAMPLE BERTHING COMPLEX

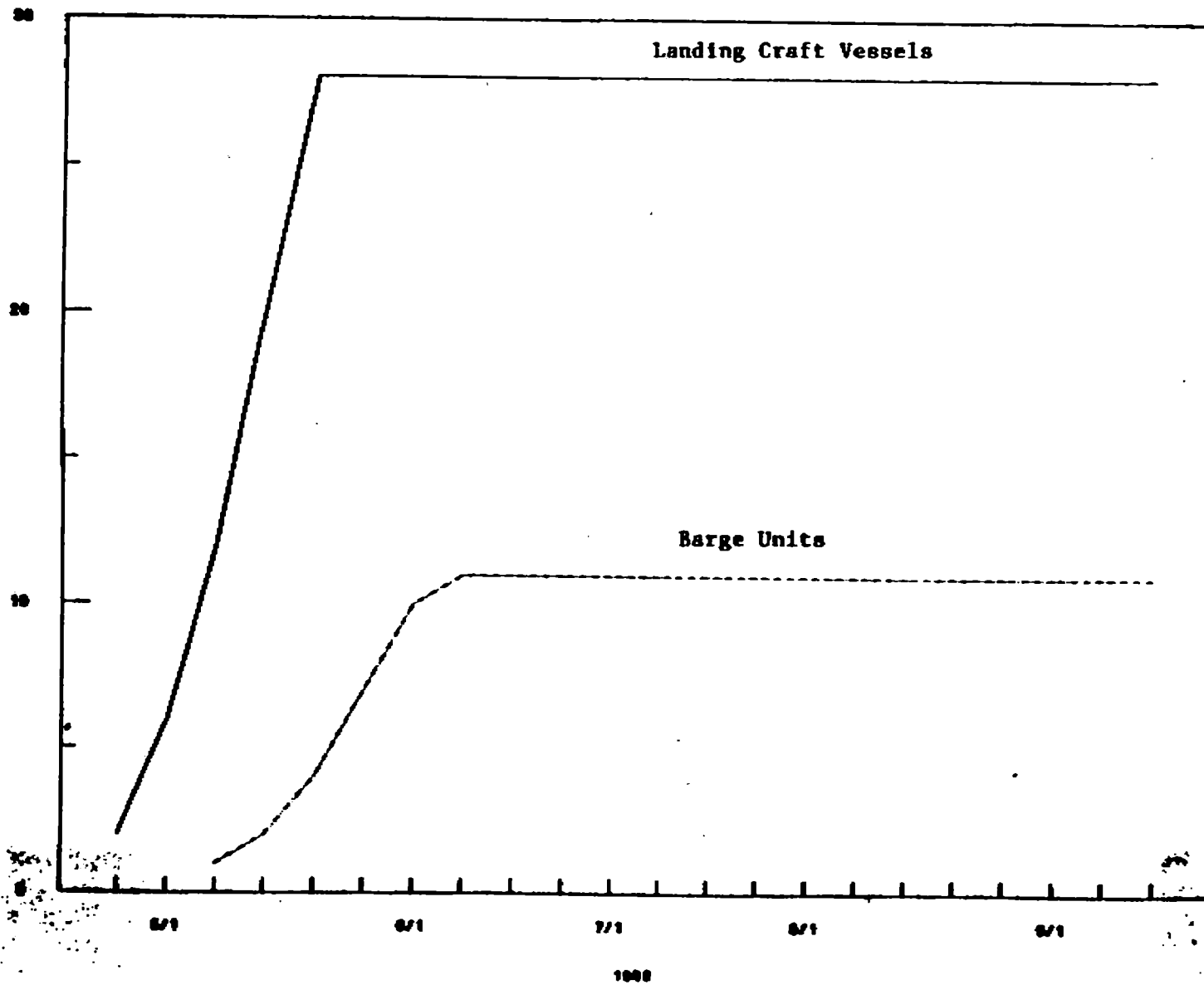


BERTHING COMPLEX AVAILABILITY

DATE	VESSEL	TYPE	# BERTHS	CUM	CREW TAXI	SUPPORT VESSELS	EXP. BOAT	REC. BOAT	SUPPLY TENDER
4/14	P.N.W. EXP.	FLOTEL	60	60	3	3	1	1	0.2
4/16	GLACIER BAY EXP.	FLOTEL	70	130	2	2	1	1	0.2
4/16	CORINTHIAM	FLOTEL	110	240	2	2	1	1	0.2
4/16	COLUMBIA	FLOTEL	100	340	2	3	1	1	0.3
4/26	BERING TRADER	FLOTEL	300	640	5	9	1	1	1
4/27	DETENDOR	FLOTEL	70	710	2	3	1	1	0.3
5/1	ALL ALASKA	FLOTEL	350	1060	6	9	1	1	1
5/3	GREENS CREEK	FLOTEL	200	1260	5	8	1	1	0.6
5/6	COLONIAL EXP.	FLOTEL	150	1410	3	4	1	1	0.5
5/10	CHENEGA BAY	CAMP(LAND)	50	1460	2	2	1	1	0.2
5/14	HORSESHOE BAY	CAMP(LAND)	60	1520	2	2	1	1	0.2
5/14	MCCLEOD HARBOR	CAMP(LAND)	60	1580	2	2	1	1	0.2
5/14	VECO BARGE	FLOTEL	200	1780	5	6	1	1	0.6
5/14	UNDERWATER	FLOTEL	150		4	4	1	1	0.5
5/21	MIDWAG BARGE	FLOTEL	200		5	6	1	1	0.6
5/30	CHARLESTON	FLOTEL	150		3	4	1	1	0.5

**Shoreline Clean-Up
Clean-Up Vessel Build-Up**

Number of Craft



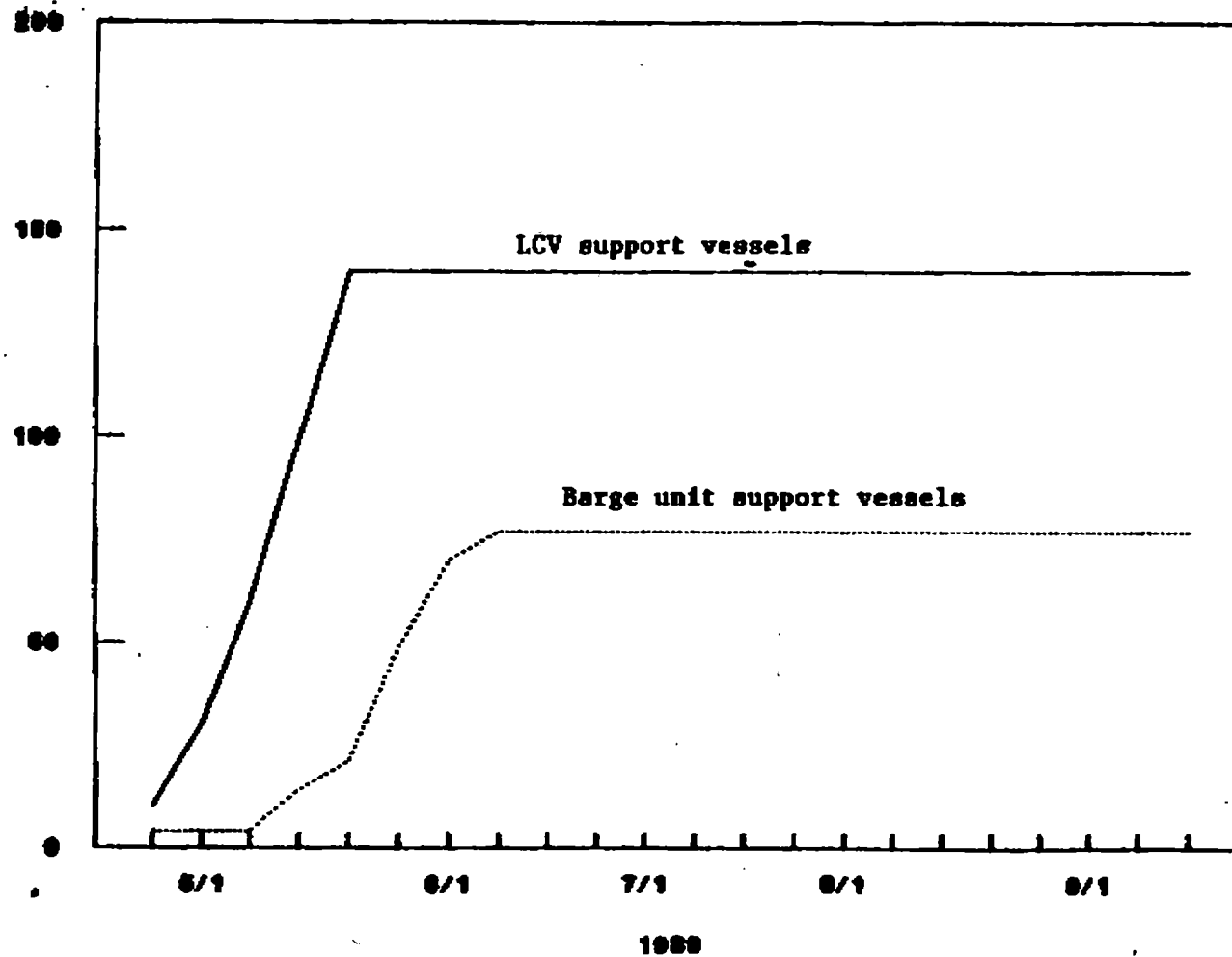
VALDEZ OIL SPILL

RESOURCE and VESSEL RAMP-UP

	<u>4/23</u>	<u>4/30</u>	<u>5/7</u>	<u>5/14</u>	<u>5/21</u>	<u>5/28</u>	PEAK 6/11 ----
A. LCV	2	6	12	20	28	28	28
B. BARGE	0	0	0	1	3	6	11
C. MANPOWER							
- DIRECT	50	150	300	550	850	1000	1250
- SUPPORT	17	50	99	182	281	330	413
- TOTAL	67	200	399	732	1131	1330	1663

Shoreline Clean-Up Utility Vessel Requirements

Utility Vessels



Exclude vessels included in berthing schedule.

04/18/89

15:33

EXXON PUBLIC AFFAIRS

022