

for lost human use due to this incident. The evaluation of specific restoration project alternatives to increase access is discussed beginning in Section 5.4.2.

5.4 **EVALUATION OF SPECIFIC RESTORATION ALTERNATIVES**

Once a general restoration type has been chosen to address a specific injury or injuries, the Trustees must evaluate among possible project alternatives to identify the project or projects of that restoration type that best meets the restoration selection criteria. The evaluation process for identifying a marsh creation project and a recreational access enhancement project is described in the following sections.

5.4.1 **Evaluation of Marsh Creation Alternatives**

The Trustees chose marsh creation as the compensatory restoration project for all ecological resource injuries. Because marsh restoration is a broad category that could include many types of actions and sites, the Trustees completed the second step of the evaluation process: the development of a range of project-specific marsh restoration alternatives and selection of a preferred alternative from that list submitted for public review and comment. The selection process for these marsh restoration alternatives is described in greater detail below.

First, the Trustees compiled an initial comprehensive list of possible marsh creation project alternatives from local agency experts, Plaquemines Parish officials, and from representatives of the RP. The Trustees then conducted an evaluation of the suggested projects using the OPA restoration selection criteria, discussed above, to identify the most appropriate project as the preferred restoration alternative to compensate for habitat, bird, and aquatic fauna injuries. The Trustees also sought input from Plaquemines Parish representatives on their views of the various projects in a meeting where some of the more attractive marsh creation restoration projects were discussed. Section 5.4.1 describes the selection process. Sections 5.4.2 through 5.4.4 provide detailed information for the selected restoration alternative and the three other, non-selected alternatives.

5.4.1.1 **Preliminary List of Marsh Restoration Alternatives**

The Trustees and the RP actively solicited restoration ideas and input from appropriate staff within Plaquemines Parish, state and federal agencies and from other interested parties. The suggestions received fell into four categories of marsh creation methods. These methods are:

1. cut a crevasse through a river pass bank to allow a splay marsh to form;
2. reconfigure a U.S. Army Corps of Engineers (COE) spoil disposal area to create marsh by cutting channels to create flow and either allow natural colonization or plant marsh vegetation;
3. dredge material and deposit it as 'islands' at appropriate elevations and allow natural colonization of marsh; and
4. create berms for COE to later fill with maintenance dredging material that would otherwise be uncontained, and plant with marsh vegetation when sufficiently de-watered.

These marsh creation alternatives were evaluated using the same OPA restoration selection criteria as were used to evaluate among the broader types of general restoration alternatives as discussed in Section 5.3.

5.4.1.2 Selected Alternative: Cut a Crevasse to Form a Splay Marsh

A crevasse will be cut through a bank to allow sediment-rich water to flow out into shallow water where the sediment settles, allowing vegetation to colonize and form a splay marsh.

5.4.1.2.1 Project Description

A crevasse will be cut in the bank along South Pass, in the PAL, to allow suspended sediment to flow out into a shallow receiving basin. As the sediment enters this area, water velocity will decrease, causing much of the suspended sediment to settle. Eventually as the sediment builds up forming mudflats, vegetation, such as *Sagittaria*, will begin to colonize the area, thereby increasing the rate of settling. *Sagittaria* is highly prized as a food item for some waterfowl species. Eventually other plant species will colonize the area as the elevation of the deposited material increases. The process will continue as long as the crevasse is open, with the advancing edge of the splay made up of plants such as *Sagittaria*, and the older sections composed of marsh vegetation such as *Scirpus*. Approximately 20 acres or more of marsh should form, with the potential for as much as 100 acres. Over time, the crevasse will begin to fill in, and the formed marsh will begin to subside. Existing crevasses in similar sites have lasted approximately 20 years (to date), and the created marsh is not anticipated to be fully lost for another 50 years or more (James Harris, USFWS pers. comm.).

A number of other locations for a crevasse were examined, but the South Pass site has several factors in its favor. South Pass is a primary channel off the Mississippi River, and crevasses that are created off of primary channels are likely to be more successful at splay formation than crevasses created at secondary or tertiary distributary channels. Additionally, there are no existing pipelines that would have to be moved to create this crevasse, unlike some other locations evaluated, which will keep costs much lower than if a pipeline had to be moved. Furthermore, a splay marsh located in PAL, a state wildlife management area, will be accessible to the general public, whereas a splay marsh created at many of the other potential sites might have less public access. Thus, the South Pass site should provide a good location for both recreational hunting and fishing.

5.4.1.2.2 Restoration Objectives

The primary goal of this restoration project is to provide vegetative habitat sufficient to compensate for lost habitat services and for bird and aquatic faunal injuries. The determination of how much created marsh is required to achieve this goal is described in the following section.

5.4.1.2.3 Restoration Scaling Approach

The scaling approach used to determine the extent of resource restoration required as compensation for natural resource injuries is based on Habitat Equivalency Analysis (HEA). HEA begins with the injury assessment and an identification of the habitat-specific resource services that were lost

due to the incident. A "debit" is specified for the lost services for each type of resource habitat. The debit equals the loss in service-acre-years from the injury to the habitat, as a result of the incident, in present-value terms. For each debit, the scale of a compensatory restoration project is determined by calculating the credit, per acre, that the restoration project will generate over its lifespan. This credit is the present value of the ecological services provided by the project. Then, the size of the compensating project is calculated so as to equate the total credit to the debit. Both the debit and per-acre credit are measured by service-acre-years, as discussed in Section 4.3.1.

This scaling procedure is summarized by the following equation:

$$\text{Debit} = (\text{Credit per acre from restoration project}) \times (\text{Acres of restoration project})$$

The first component is the debit for the injured resource services. The second component is the credit per acre from implementing the restoration project. The credit is based on a set of input parameters to the HEA model. Given the debit, and the credit per acre for restoration, it is a simple task to solve the equation for the acres of the restoration project needed to equal the debit.

5.4.1.2.3.1 *HEA Debit Model*

The debit is composed of two parts. The first part corresponds to the reduction in the full set of marsh services from oiled habitats, including faunal support services. This part of the debit corresponds to the habitat injuries described in Chapter 4. Because the selected type of restoration for all habitat injuries is marsh, all of the habitat injuries were converted into DSAYs of marsh. The Trustees treated services from delta marsh and freshwater river vegetation as equivalent to services provided by splay marsh. However rip-rap and sandflat habitats are less productive than marsh; therefore, the DSAYs associated with these habitats, translated in marsh DSAYs, is less than shown in Table 4-2. Given the low level of injury to these habitats, the Trustees did not conduct studies to assist in converting rip-rap or unvegetated sandflat DSAYs into marsh DSAYs. The debit in sandflat DSAYs is 0.8, and was translated to marsh services (0.16 DSAYs) by assuming that marsh provides approximately five times the service flows of unvegetated sediments. This assumption was adopted from the trade-off assumption developed for another NRDA in a Gulf of Mexico estuary (Kern, 1999). The debit in rip-rap DSAYs is 2.3, and was translated to marsh services (0.23 DSAYs) by assuming that marsh provides approximately ten times the service flows of rip-rap. The Trustees believe that this assumption concerning the trade-off between marsh and rip-rap habitats is very conservative, based on discussions with experts on Mississippi River ecology (e.g., Carl Way, Barry Vittor and Associates, 2000). The estimated level of rip-rap injury was deemed too low to justify the expense of refining the trade-off estimate to lower the DSAYs of marsh injury (translated from rip-rap injury). The total injury for habitats, translated into marsh, is 6.08 DSAYs.

The second part of the debit corresponds to the direct aquatic faunal and bird injuries described in Chapter 4, translated into marsh services, required to restore direct faunal losses. Indirect injuries to fauna due to reductions in habitat services that support fauna are included in the habitat debit. The process of translating biomass of lost aquatic fauna and birds into marsh biomass is described in Galvin (2001b). The total injury for aquatic fauna and birds, translated into marsh biomass production (considering the efficiency of energy transfer through different trophic levels), is 9,697,950 kg. Using the assumptions provided in Moore and Kern (2001), the faunal loss is

equivalent to 239.6 DSAYs, considering primary production from the marsh as the only service considered (Galvin, 2001b).

5.4.1.2.3.2 *HEA Credit Model*

Similarly to the process of calculating the HEA debit, the HEA credit has two components, that for habitats and that for fauna.

To quantify the benefits per acre from the marsh creation project in terms of marsh services (habitat service losses) and primary production (faunal losses) and ultimately to determine the scale of restoration, a number of parameters were defined. The parameters include when the restoration project begins (assumed to be 2002), the rate of splay growth and the provision of services over time, the lifespan of the marsh, and the relative productivity of the created resources and services compared to the injured resources and services. The description of the assumptions used for the splay marsh is provided in Moore and Kern (2001). Opinions of experts and published studies were used in developing these conservative assumptions. Basically, it was assumed that the created splay would grow at a constant rate for a period of 15 years, and then would begin to decline at a constant rate over the next 25 years. The service flows of this marsh at maturity (after four years) is assumed to be equivalent to the service flows from the freshwater vegetation and delta marsh habitats.

After developing the assumptions for the characteristics required to calculate the amount of credit gained per acre of created marsh, the restoration needs for injured habitats and for faunal losses were calculated separately. The results of this scaling exercise is that 0.04 acres of growth per year of vegetated splay marsh is required to compensate for habitat injuries; another 1.53 acres of growth per year is required to compensate for the faunal injuries. Therefore, the growth of approximately 1.57 acres per year of splay marsh is required to compensate for all of the ecological injuries considered in this assessment. Details of the entire HEA calculations and results are located in the administrative record (Galvin, 2001c).

For the faunal restoration component, it should be recognized that primary production is the only service the created marsh will provide that counts toward compensating for the faunal injury. Other ecological services provided by this portion of marsh are not considered in the scaling calculations. For this incident, trying to distinguish the 'excess' services provided by the marsh acreage that goes toward compensating for the faunal injury, and reducing the acreage requirement to adjust for that excess, would be difficult and time-consuming. Given that a marsh splay project's size cannot be strictly controlled, and instead marsh forms as long as the crevasse remains open, there would be no cost-savings in construction costs if this calculation (or, for that matter, any refinement of the injury estimates, themselves) was conducted. This is because there would be no change in the project design. This represents an additional level of conservatism in the Trustees' overall restoration planning process.

5.4.1.2.4 *Probability of Success*

Crevasse projects in the Mississippi delta area have been successfully implemented and studied for a number of years (for example, see Boyer et al., 1997). This potential project site was identified by

experts in splay marsh creation as a good location for creating a splay marsh. The probability of success for this project is therefore very high.

5.4.1.2.5 Performance Criteria and Monitoring

Post-implementation monitoring is an essential component of any restoration project and will be performed for this project. The monitoring program for this restoration effort is designed to objectively determine whether the project goals and objectives have been achieved. Information gathered during monitoring will help the Trustees assess the performance, viability, and stability of the restoration project. Monitoring will allow the Trustees and RPs to determine whether corrective actions are required to meet the restoration project's goals and objectives. Project performance will be assessed by comparing quantitative monitoring results to pre-determined performance criteria developed by the Trustees that define the minimum physical or structural conditions of the project that are important in determining if the restoration is successful.

5.4.1.2.5.1 *Monitoring Schedule*

Monitoring will be conducted annually for three years for the crevasse project to provide an assessment of project progress and allow for implementation of corrective actions early in the project, if warranted. Baseline acreage will be determined prior to construction of the crevasse, and monitoring events will occur once per year for the next three years. Additional monitoring will not be required if the project meets the required performance criteria

5.4.1.2.5.2 *Performance Criteria*

The crevasse project's success will be determined by comparing quantitative monitoring results to pre-determined performance standards. Performance standards are criteria developed by the Trustees that define the minimum physical or structural conditions of the restoration project deemed to represent acceptable growth and development. If the performance criteria are satisfied at the 3-year monitoring event, then the Trustees are confident, based on previous experience, that the project will be successful and no further monitoring will be required. The specific performance criteria are that there be at least 4.7 acres of vegetated splay marsh, that the crevasse remain open, and that plant species characteristic of splay marshes are present at the end of three years. An aerial photograph taken prior to the cutting of the crevasse will be used to determine the baseline for measurement of future growth of the splay. Aerial photographs will be taken each year for three years to gauge the progress of the splay development.

5.4.1.2.6 Corrective Actions

Should one or more of the performance criteria not be met, corrective action will be considered to remedy the situation. Corrective action options to be considered include: waiting for an additional period of time to see if the project begins to match predicted trends in growth, re-opening the crevasse, opening a new crevasse, or other actions agreed upon that would correct the deficiency and ensure growth at the required rates.

5.4.1.2.7 Environmental and Socioeconomic Impacts

Creating a splay marsh is not expected to have any significant adverse environmental or economic impacts. As discussed below, there will be some impact to a small area of habitat directly affected by cutting the crevasse, but the environmental benefits of this project will far outweigh this impact, as proven by the performance of other crevasse projects in this area. The impacted area will gradually recover, and the opening will eventually silt in and become vegetated. Created marsh will gradually disappear once the crevasse does silt in. The environmental benefits associated with the created marsh will far exceed the miniscule and temporary adverse affects from implementation of this project.

5.4.1.2.8 Evaluation

Marsh creation by cutting crevasses is a well-proven technology that has been successfully used at a large number of sites in the Mississippi River delta area. It was previously used as the restoration alternative for ecological injuries on the 1995 Dixon Bay oil spill (Trustees, 1995). Marsh formed as a result of this method of creation is very productive, and is used by a variety of fauna, including wintering waterfowl. A splay marsh has a high probability of growing beyond the required acreage, thus providing additional benefits beyond those strictly required to compensate for the injuries from the spill. Splay marshes can be very inexpensive to construct, especially if considered on a per-acre basis, provided that there are no obstacles to cutting the crevasse such as pipelines. There would be some impact to a small amount of existing habitat when cutting the crevasse, but the anticipated gain in habitat would far outweigh this small impact (as proven by similar projects conducted in the past). This type of project will not impact public health or safety. The great benefits obtained, the high likelihood of success, and the low cost make this marsh creation method the best overall fit to the restoration selection criteria.

5.4.1.3 Non-Selected Alternative: Reconfigure Spoil Disposal Area

There are a number of spoil disposal areas that were intended to result in marsh formation, although some of them have formed marsh. This alternative would create marsh on one of the non-successful disposal areas.

5.4.1.3.1 Project Description

This project would consist of reconfiguring one of the COE's spoil disposal areas by creating channels to allow water to access the interior of the area. These channels would provide a mechanism for marsh vegetation to colonize what is currently bare sediment, and would provide access for aquatic fauna to utilize the new marsh. Marsh vegetation could be planted to supplement natural colonization to speed the provision of service flows, or, a larger area could be left to naturally colonize without active planting. Spoil deposition areas that are already being successfully colonized would not be appropriate for this type of project; instead an area that is either not becoming vegetated or is doing so at a very slow rate would be chosen.

5.4.1.3.2 Environmental and Socioeconomic Impacts

This project would impact only bare sediments, and so would have little adverse environmental impacts. It would not be expected to have significant adverse socioeconomic impacts.

5.4.1.3.3 Evaluation

Although this type of project is believed to be technically feasible and would be relatively inexpensive, this project would not be expected to benefit as many resources, to such a high degree, as would the crevasse project. Implementation of this type of marsh creation alternative would not adversely impact ecologically valuable habitat, and would not affect public health or safety. One potential problem with this type of project is that there is little information to guide the Trustees in estimating the provision of service flows, unlike the situation for creation of a splay marsh. Therefore, the Trustees could not accurately determine the amount of restoration necessary without additional study. While this type of project appears to be a very promising alternative, it does not meet all the selection criteria as well as the selected alternative does.

5.4.1.4 Non-Selected Alternative: Deposit Dredge Material to Create Marsh Islands

Marsh has been created in the delta area by using dredge material to form islands at an elevation suitable for establishment of marsh previously, and this method was suggested to the Trustees for consideration as a restoration alternative.

5.4.1.4.1 Project Description

This project would consist of dredging material from the area at the confluence of Dennis, Loomis, and Johnson Passes, and re-depositing that material as small islands in the shallow open-water area known as Sawdust Bend. The material would be deposited so that, after settling, it would be at an elevation suitable for marsh vegetation. Vegetation would be allowed to colonize these islands naturally.

5.4.1.4.2 Environmental and Socioeconomic Impacts

There would be minor environmental impacts associated with dredging and then depositing the dredged material. These impacts would be primarily in the borrow and fill areas, although an increase in turbidity would affect water quality for a short period of time. There would be a socioeconomic benefit to navigation by opening up an area at the confluence of these passes that has shoaled up to a significant degree.

5.4.1.4.3 Evaluation

Projects of this sort have been implemented successfully in the general area; and, therefore, the likelihood of success for this type of project at this location is high. It would also be relatively inexpensive, but not as cost-effective as the crevasse project. This project would benefit resources in the area similarly to the crevasse project, except that the marsh island project would not grow beyond the original size, and would begin to erode much sooner. Scaling for this type of project

would be more expensive than scaling for a splay marsh, because less is known about these marsh island projects and additional study would be required to develop scaling parameter estimates. This project would be expected to have little effect on public health and safety and would have socioeconomic benefits by enhancing navigation. Although this project has many benefits and fits the restoration selection criteria well, the selected alternative was chosen because it will have greater overall benefits, has a greater likelihood of success, and is more cost-effective.

5.4.1.5 Non-Selected Alternative: Create Containment Dikes For The Corps Of Engineers To Fill

The COE performs maintenance dredging in many areas of the Mississippi River delta, and some of the dredged material is placed in shallow water without any containment to keep the elevation suitable for marsh development. The construction of containment to help establish elevations of spoil material from maintenance dredging suitable for the establishment of marsh was identified as a potential restoration alternative.

5.4.1.5.1 Project Description

This project would involve the construction of containment dikes for use by the COE to hold material from maintenance dredging activities to create areas at an elevation suitable for marsh establishment. Active planting of the marsh would occur once the sediment placed within the containment de-waters sufficiently.

5.4.1.5.2 Environmental and Socioeconomic Impacts

This project is not expected to have significant adverse environmental or socioeconomic impacts.

5.4.1.5.3 Evaluation

This project is technically feasible in theory, although its success would depend upon the activities of the COE, which would be outside of Trustee control. Additionally, there would be no guarantee as to when the dredging work would be done by the COE, which would make scaling the project very difficult.

5.4.2 Evaluation of Recreational Access Enhancement Projects

The Trustees selected enhancement of recreational access as the compensatory restoration project for recreational losses. Because enhancement of recreational access is a broad category that could include many types of actions and sites, the Trustees completed the second step of the selection process: the development of a range of project-specific recreational access enhancement alternatives and selection of a preferred alternative which was submitted for public review and comment.

5.4.2.1 Preliminary List of Recreational Access Enhancement Alternatives

The Trustees and the RP actively solicited restoration ideas and input from appropriate staff within

Plaquemines Parish, state and federal agencies and from other interested parties. The suggestions received were:

1. construction of boat dock to improve recreational access at Freshwater Reservoir on PAL;
2. upgrade boat ramp at Fort Jackson; and
3. improvement of access and public camping grounds at DWR.

These alternatives were evaluated using the same OPA restoration selection criteria as were used to evaluate among the broader types of restoration alternatives as discussed in Section 5.3.

5.4.2.2 Selected Alternative: Construction of Boat Dock to Improve Recreational Access at Freshwater Reservoir on PAL

Fishing and hunting are prime uses of PAL. This alternative would serve to enhance access to an unimproved area that is often used as a campground by anglers and hunters, and was very strongly supported by PAL staff. Implementation of this alternative is expected to increase recreational use of this area.

5.4.2.2.1 Project Description

The main component of this alternative is to construct a dock at the Freshwater Reservoir on PAL that will improve access to this area. The specific design of the dock is being developed by PAL personnel and representatives of the RPs, and is subject to approval by the Trustees. The dock is anticipated to be a T-shaped dock. The dock will be constructed of treated wood pilings with treated decking on top. Additionally, small improvements will be made in the area used for camping, consisting of the construction of several picnic tables and grill pits. The proposed design of the dock project has been evaluated by the Trustees to ensure that the facility adequately enhances recreational access opportunities, thereby compensating the public for the loss of access to resources during the Westchester spill.

5.4.2.2.2 Restoration Objectives

The objective of this project is to increase access to, and use of, the area, thereby compensating for the loss of access and use caused by the incident.

5.4.2.2.3 Restoration Scaling Approach

Given the relatively small level of recreational loss, the Trustees have determined that valuation of the replacement services could not be performed within a reasonable timeframe and at a reasonable cost. Therefore, the Trustees are selecting a restoration project that has a cost equivalent to the estimated value of lost services, consistent with 15 C.F.R. § 990.53(d)(3)(ii). To accomplish this, the Trustees compared the cost for the Trustees to construct the dock to the estimated injury range. The project is judged sufficient since the estimated Trustees' implementation cost is comparable to the high end of the preliminary recreational lost use injury range estimate (Moore, 2001). In

evaluating the estimated cost of implementation, the Trustees' approach was to use medium to high estimates for individual components of the project, thereby guaranteeing completion of the project.

5.4.2.2.4 Probability of Success

The unimproved area is already used as a campground by anglers and hunters. Refuge personnel believe that the dock will increase access to, and recreational use of, this area in PAL; the other amenities provided will also improve the recreational experience, thus potentially attracting new anglers and hunters to the site. Thus, the Trustees feel that there is a very high probability of success in compensating for the recreational losses.

5.4.2.2.5 Performance Criteria

For the recreational projects, the performance criteria are simply that the actual construction matches the construction details as outlined in permits and the project specifications required by the Trustees.

5.4.2.2.6 Environmental and Socioeconomic Impacts

No significant adverse environmental or socioeconomic impacts are expected from implementation of this restoration alternative. The primary environmental impact will be to the small area of waterbottom that will be covered by the construction of the dock.

5.4.2.2.7 Evaluation

This project is technically feasible, and there is a strong likelihood of success of the project. The construction of a dock in the PAL will help improve access to the natural resources of the area by hunters and anglers, and refuge officials believe that use of this area will increase as a result of this project. There will be slight impacts to the waterbottom of the pass when the dock is built, but overall few impacts are expected. The presence of the dock should benefit the public by making boarding and exiting boats easier, and thus safer. The project is also very cost-effective. The additional amenities to the adjacent area used as a campground should also serve to increase usage of the area, thereby increasing access to the natural resources of PAL. This alternative was therefore selected to compensate for recreational lost use resulting from the Westchester incident.

5.4.2.3 Non-Selected Alternative: Upgrade Boat Ramp At Fort Jackson

Fort Jackson is within the area affected by the spill, and is used as a launch site to access the Mississippi River. Improvements in the launching facility would enhance access to the river.

⁷ This approach is consistent with what Trustees would do if they were to actually receive a financial settlement and seek to choose a project for implementation. This minimizes the possibility of cost overruns in a Trustee implementation scenario that could result in an unfinished project and no ability to seek additional funds for completion.

5.4.2.3.1 Project Description

The project, as originally conceived, was to make improvements to a boat ramp at Fort Jackson. Upon examination of the site, however, no actual boat ramp was located. A number of sites where boats were launched were found in the area, but none of these appeared to be good candidates for upgrading. There were also some safety and security concerns about the Fort Jackson site and its desirability for use in increasing recreational access. The cost of construction of a new boat ramp would far exceed the value of the loss, as estimated by the Trustees (Section 4.4.4.2)

5.4.2.3.2 Environmental and Socioeconomic Impacts

Little adverse environmental or socioeconomic impact would be expected to result from this project.

5.4.2.3.3 Evaluation

A number of considerations make this proposed alternative less desirable than the dock at PAL. Although the upgrading of boat launch facilities in the Fort Jackson area would be expected to increase access, the existing facilities for launching boats are not conducive to improvement at a cost consistent with the magnitude of the injury.

5.4.2.4 Non-Selected Alternative: Improvement of access and public camping grounds at DWR

Fishing and hunting are prime uses of DWR. This alternative would serve to enhance access to a campground and make minor enhancements. Implementation of this alternative would be expected to increase public use of this area.

5.4.2.4.1 Project Description

The Trustees received general ideas on improvements for public access and enhancement of camping grounds at DWR. The information received suggests that the types of projects available are basically similar to those at PAL.

5.4.2.4.2 Environmental and Socioeconomic Impacts

Little adverse environmental or socioeconomic impact would be expected to result from this project, although the lack of more specific information makes it difficult to address this issue more completely.

5.4.2.4.3 Evaluation

Given that the preferred (now selected) alternative at PAL was believed to be similar to what could be done at DWR, the projects would probably be similar in terms of their consistency with the restoration selection criteria. Given that the preferred (now selected) ecological restoration project is at PAL, then possible cost-savings could occur by also constructing the recreational project at

PAL. Additionally, the location of a recreational access enhancement close to the site of the splay marsh created as a restoration alternative for the ecological injuries is attractive because splay marshes are good waterfowl hunting areas, which is another factor favoring the project at PAL over that at DWR.

5.5 RESTORATION SUMMARY

The Trustees determined that natural recovery (no action) was the appropriate primary restoration alternative to address all ecological and recreational injuries resulting from this incident. After evaluating a number of different potential types of restoration actions, the Trustees selected marsh creation as the appropriate form of restoration to address ecological injuries and recreational access enhancement as the appropriate form of restoration to address recreational losses. Table 5-1 summarizes the restoration alternative selection process.

Injured Resource/Service	Primary Restoration Alternatives	Compensatory Restoration Alternatives
Delta Marsh and Freshwater Vegetated Habitats	Natural Recovery	No Compensation Required
		Marsh Creation
Rip-Rap Habitat	Natural Recovery	No Compensation Required
		Placement of Additional Rip-rap
		Marsh Creation
Sandflat Habitat	Natural Recovery	No Compensation Required
		Create Additional Sandflat Area
		Marsh Creation
Aquatic Fauna	Natural Recovery	No Compensation Required
		Oyster Reef Creation
		Restock fauna
		Marsh Creation
Birds	Natural Recovery	No Compensation Required
		Nest Site Enhancement/Protection
		Habitat Modification
		Oyster Reef Creation
		Marsh Creation
Recreational Use	Natural Recovery	No Compensation Required
		Increase Recreational Access

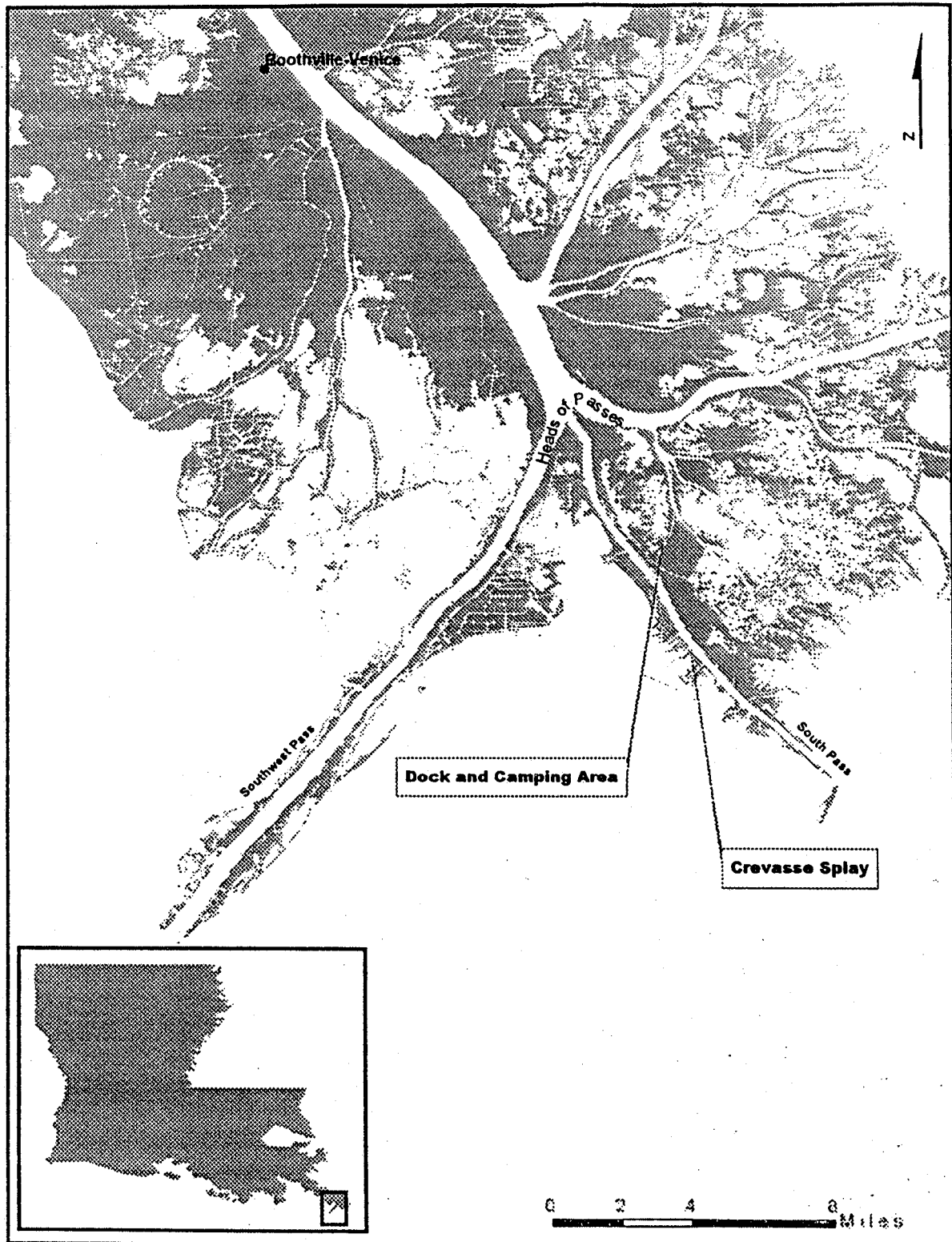
Selected alternatives in bold; the natural recovery and no compensation required alternatives are equivalent to the No Action NEPA alternative.

The Trustees selected marsh splay creation off South Pass on the PAL as the restoration action to compensate for injuries to habitats, aquatic fauna, and birds (Figure 2). The Trustees chose this project from a broad range of alternatives that included oyster reef creation, enhancement or protection of bird nest sites, and placement of additional rip-rap. The project selected is expected to create more marsh than is required to compensate for the ecological injuries, over the first fifteen years following its construction.

The Trustees selected construction of a dock along with smaller complimentary recreational amenities near the dock at the Freshwater Reservoir on PAL as the restoration action to compensate for lost human recreational use, primarily hunting and fishing, resulting from the Westchester

incident (Figure 2). An unimproved area on PAL that has been used by anglers and hunters as a campground will be enhanced by the construction of a dock to allow better access to the area, as well as minor improvements to the campground itself. Other restoration actions considered include enhancement of boat launching facilities at Fort Jackson and construction of access and recreational amenities on DWR.

FIGURE 2. Sites of proposed restoration actions to compensate for ecological and recreational injuries resulting from the Westchester incident.



LITERATURE CITED:

Boyer, Mark E., Harris, James O., and R. Eugene Turner, 1997. Constructed Crevasses and Land Gain in the Mississippi River Delta. *Restoration Ecology*, 5:85-92.

Curry, Mark, 2000. Memorandum to John Kern and Lisa DiPinto (NOAA), dated December 7, 2000. Subject: Evaluation of Rip-rap and Revetment Habitat in the Lower Mississippi River.

French-McCay, Deborah and Christopher Galagan, 2001. M/T Westchester Spill in the Mississippi River, November 2000: Modeling of Physical Fates and Biological Injuries. Final Report dated September 2001.

Galvin, Toben, 2001a. Memorandum to Administrative Record entitled "Recreational Hunting and Fishing Economic Losses from the M/V Westchester Oil Spill of November 28, 2000, Lower Mississippi River, Louisiana." Dated September 5, 2001.

Galvin, Toben, 2001b. Memorandum to Administrative Record entitled "Faunal Injuries and Compensatory Restoration Requirements for the M/V Westchester Oil Spill of November 28, 2000, Lower Mississippi River, Louisiana." Dated September 5, 2001.

Galvin, Toben, 2001c. M/V Westchester Habitat Equivalency Model. Dated September 5, 2001.

Kern, John, 1999. Memorandum from John Kern (NOAA) to Jessie Webber (ENTRIX), dated July 28, 1999. Subject: Basis for Marsh:Subtidal Sediment Trade-off Ratio of 5:1.

Moore, Tom and John Kern, 2001. Memorandum to Administrative Record entitled "Splay Marsh Restoration Assumptions." Dated August 10, 2001.

Moore, Tom, 2001. Memorandum to Administrative Record entitled, "Westchester Oil Spill Recreational Project". Dated December 20, 2001.

National Park Service, 2001. Draft Heritage Study and Environmental Assessment website. [Http://www.cr.nps.gov/delta/home.htm](http://www.cr.nps.gov/delta/home.htm). As modified March 14, 2001.

NOAA, 1999. Discounting and the treatment of uncertainty in natural resource damage assessment. Technical Paper 99-1. National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program.

NOAA, 2000. Habitat Equivalency Analysis: An Overview. Technical Paper. National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program. Revised from 1995 version.

Research Planning, Inc., 2001. Preassessment Data Report M/T Westchester Oil Spill Mississippi River Mile 38, Louisiana. Final report, Dated September 17, 2001.

Trustees, 1995. Damage Assessment and Restoration Plan: Wellhead Failure and Release. Dixon Bay, Louisiana. 34 pp. Participating Trustees: LOSCO, LDEQ, LDNR, LDWF, NOAA, and USFWS.

Trustees, 1999. Damage Assessment and Restoration Plan: Texaco Pipeline Inc. Crude Oil Discharge. Lake Barre, Louisiana. 79 pp. Participating Trustees: LOSCO, LDEQ, LDNR, LDWF, NOAA, and USFWS.

LIST OF PREPARERS

Chris Piehler	Louisiana Department of Environmental Quality
John de Mond	Louisiana Department of Environmental Quality
Derek Hamilton	Louisiana Department of Natural Resources
Heather Finley	Louisiana Department of Wildlife and Fisheries
Jim Hanifen	Louisiana Department of Wildlife and Fisheries
Warren Lorentz	Louisiana Oil Spill Coordinator's Office
Buddy Goatcher	United States Fish and Wildlife Service
Jason Forman	National Oceanic and Atmospheric Administration
Toben Galvin	National Oceanic and Atmospheric Administration
John Kern	National Oceanic and Atmospheric Administration
Tom Moore	National Oceanic and Atmospheric Administration
Tony Penn	National Oceanic and Atmospheric Administration

FINDING OF NO SIGNIFICANT IMPACT

Having reviewed the attached environmental assessment and the available information relative to the proposed actions in the Mississippi River delta, Louisiana, the undersigned has determined that there will be no significant environmental impacts from the proposed actions. Accordingly, preparation of an environmental impact statement on these issues is not required by Section 102 (2) (c) of the National Environmental Policy Act (42 U.S.C § 4332(2)(c)) or its implementing regulations.

_____ Date _____

William T. Hogarth
Assistant Administrator for Fisheries
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U. S. Department of Commerce

Appendix A Administrative Record Index (through December 20, 2001)

Record	Date	Title or Description
1	N/A	NRDA- One Page LOSCO Handout
2	N/A	Louisiana Oil Spill Prevention and Response Act
3	3/20/99	Natural Resource Damage Assessment Rule, Vol. 25, No. 3
4	8/96	Guidance Documents for Natural Resource Damage Assessments Under OPA 90 (NOAA CD)
5	11/28/00	National Response Center Incident Report: NRC #549451
6	11/28/00	Louisiana State Police Incident Report: LSP #00-07111 (7:46:41 PM)
7	11/29/00	Louisiana State Police Incident Report: LSP #00-07111 (8:55:39 AM)
8	11/30/00	Spill Report Update from Welcome Duncan (RRT-VI Coord.) to Primary Regional Response Team Members
9	12/02/00	SCAT Reports
10	12/08/00	Curry, Mark, 2000. Memorandum to John Kern and Lisa DiPinto (NOAA). Subject: Evaluation of Rip-rap and Revetment Habitat in the Lower Mississippi River
11	12/08/00	Tri-State Bird Rescue & Research, Inc.- End of Day Report
12	11/30-12/11/00	Field Notes: Warren Lorentz (LOSCO)
13	12/11/00	Field Notes and Photographs with Descriptions: John Kern (NOAA)
14	1/31/01	Helicopter Flight Line Maps (Polaris Applied Science, Inc.)
15	2/01/01	Letter Inviting Plaquemines Parish, Polaris Applied Science, Inc., and Terriberry, Carroll & Yancey, LLP to Provide Potential Compensatory Restoration Projects
16	2/02/01	Tri-State Bird Rescue & Research, Inc.- End of Spill Report
17	2/13/01	Charlie Hebert (USFWS) Raw Data Field Notes
18	3/15/01	Letter to Polaris Applied Science, Inc., Terriberry, Carroll & Yancey, LLP, and Sarah Burgess (Gard Services) Regarding the Current Status of Trustee Actions on the Westchester Oil Spill
19	3/21/01	Letter from Terriberry, Carroll & Yancey, LLP Accepting the Invitation to Participate in a Cooperative NRDA
20	3/22/01	Tech. Papers: Primary Productivity of Crevasse Plants Versus Salt Marsh
21	4/13/01	Technical Memorandum: Splay Marsh Restoration Assumptions (Tom Moore and John Kern, NOAA)
22	4/17/01	Letter Inviting the Responsible Party to Participate in a Cooperative NRDA
23	4/17/01	Notice of Intent to Gary Mauseth (Polaris Applied Science, Inc.) and Steve Mattesky (Terriberry, Carroll & Yancey, LLP)
24	5/17/01	Notice of Intent to Victoria Caridas (Plaquemines Parish Government)
25	5/21/01	Notice of Intent Published in State Register

Record	Date	Title or Description
26	5/22/01	Notice of Intent Published in The Advocate and The Plaquemines Gazette Newspapers
27	11/29-2/2/01	Press Releases from Joint Information Center
28	12/05/00	Technical Report: What Would Cause the Oil to Remobilize
29	1/29/01	Summary of Trustee Meeting
	5/15/01	Summary of Trustee and Responsible Party Meeting
	6/12/01	Summary of Trustee, Responsible Party, and Plaquemines Parish Government Meeting
	6/31/01	Summary of Trustee and Responsible Party Conference Call
30	8/29/01	Letters to Polaris, Terriberry, Carroll & Yancey, LLP and Sarah Burgess (Gard Services) Regarding the Draft DARP/EA and Public Comment Period
31	N/A	Information Management Report CD (NOAA)
32	N/A	Response/NRDA Pictures CD: LOSCO, USFWS, and NOAA
33	N/A	All Files Produced in the Incident Command Center During Response CD
34	9/05/01	Habitat Equivalency Analysis Model Results (Toben Galvin, NOAA)
35	9/05/01	Technical Memorandum: Recreational Hunting and Fishing Economic Losses from the M/V Westchester Oil Spill of November 28, 2000, Lower Mississippi River, Louisiana (Toben Galvin, NOAA)
36	9/05/01	Technical Memorandum: Faunal Injuries and Compensatory Restoration Requirements for the M/V Westchester Oil Spill of November 28, 2000, Lower Mississippi River, Louisiana (Toben Galvin, NOAA)
37	9/17/01	Preassessment Data Report M/T Westchester Oil Spill Mississippi River Mile 38, Louisiana (Research Planning, Inc.)
38	9/20/01	Public Notice: Availability and Request for Comments on a Draft Damage Assessment and Restoration Plan/Environmental Assessment for the Westchester Incident
39	12/22/95	Draft Damage Assessment and Restoration Plan/Environmental Assessment for Dixon Bay, Louisiana (Trustees)
40	03/97	Technical Paper by Mark E. Boyer, James O. Harris, and R. Eugene Turner: Constructed Crevasses and Land Gain in the Mississippi River Delta, Published in Restoration Ecology Volume 5, pages 85-92)
41	4/01	Technical Report: M/T Westchester Spill in the Mississippi River, November 2000: Modeling of Physical Fates and Biological Injuries (Deborah French-McCay and Christopher Glagan, Applied Science Associates)
42	9/27/01	Letters to Polaris, Terriberry, Carroll & Yancey, LLP and Sarah Burgess (Gard Services) Regarding the Public Review Draft DARP/EA

Record	Date	Title or Description
43	10/4/01	Memorandum from Tom Moore (NOAA) to Georgia Cranmore (NOAA) Regarding the Endangered Species Act Section 7 Consultation
44	10/4/01	Letter from Tom Moore (NOAA) to David Fruge (USFWS) Regarding the Endangered Species Act Section 7 Consultation
45	10/15/01	Memorandum from Tom Moore (NOAA) to Andreas Mager (Office of Habitat Conservation: M/V Westchester Oil Spill Restoration EFH Coordination
46	10/29/01	Memorandum from Tom Moore (NOAA) to Joseph E. Powers, Ph.D. (NOAA) Regarding the Endangered Species Act Section 7 Consultation
47	10/30/01	Letter from Russell Watson (USFWS) to Tom Moore (NOAA): Regarding the Endangered Species Act Section 7 Consultation
48	11/5/01	Letter from Russell Watson (USFWS) to Warren Lorentz (LOSCO): Comments on the Draft DARP/EA
49	12/20/01	Memorandum from Tom Moore (NOAA) to the Administrative Record Regarding the M/V Westchester Oil Spill Recreational Project

Appendix B COMPLIANCE WITH KEY STATUTES, REGULATIONS AND POLICIES

Oil Pollution Act of 1990 (OPA), 33 U.S.C. § 2701, et seq., 15 C.F.R. Part 990

OPA establishes a liability regime for oil spills that injure or are likely to injure natural resources and/or the services that those resources provide to the ecosystem or humans. OPA provides a framework for conducting sound natural resource damage assessments that achieve restoration. The process emphasizes both public involvement and participation by the RPs. The Trustees have conducted this assessment in accordance with the OPA regulations.

National Environmental Policy Act (NEPA), 42 U.S.C. § 4321, et seq., 40 C.F.R. § 1500, et seq. An Environmental Assessment (EA) was prepared for the selected restoration projects as part of the DARP. The EA evaluated the affects of implementing the crevasse project and recreation project. The NEPA process concluded with a finding of no significant impact (FONSI), following public review of the draft EA and the finalization of the EA.

Clean Water Act (CWA), 33 U.S.C. § 1251, et seq.

The CWA is the principal law governing pollution control and water quality of the nation's waterways. Section 404 of the law authorizes a permit program for the beneficial uses of dredged or fill material. The COE administers the program. In general, restoration projects, which move significant amounts of material into or out of waters or wetlands, for example, hydrologic restoration of marshes, require 404 permits. Under 401 of the CWA, restoration projects that involve discharge or fill to wetlands or navigable waters must obtain certification of compliance with state water quality standards. All necessary 404 permits will be obtained for the selected projects.

Rivers and Harbors Act, 33 U.S.C. § 401, et seq.

The Rivers and Harbors Act regulates development and use of the nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waterways and vests the COE with authority to regulate discharges of fill and other materials into such waters. Restoration actions that comply with the substantive requirements of Section 404 of the CWA will also comply with the substantive requirements of Section 10 of the Rivers and Harbors Act.

Coastal Zone Management Act (CZMA), 16 U.S.C. § 1451, et seq., 15 C.F.R. Part 923

The goal of the CZMA is to preserve, protect, develop, and, where possible, restore and enhance the nation's coastal resources. The federal government provides grants to states with federally approved coastal management programs. Section 1456 of the CZMA requires that any federal action inside or outside the coastal zone shall be consistent, to the maximum extent practicable, with the enforceable policies of the approved state management programs. No federal license or permit may be granted without giving the state the opportunity to concur that the project is consistent with the state's coastal policies. The regulations outline the consistency procedures that will be followed by the Trustees. The Trustees believe that the selected restoration actions are consistent with the Louisiana Coastal Management Plan and will seek concurrence from the state.

Endangered Species Act (ESA), 16 U.S.C. § 1531, et. seq., 50 C.F.R. Parts 17, 222, 223 & 224

The ESA directs all federal agencies to assist in the conservation of threatened and endangered species to the extent their authority allows. Protection of wildlife and preservation of habitat are the central objectives in this effort. The U.S. Department of Commerce (through NOAA) and DOI (through USFWS) publish lists of endangered and threatened species. Section 7 of the Act requires that federal agencies consult with these departments to minimize the effects of federal actions on these listed species.

The restoration actions described in this DARP/EA are not expected to adversely impact any species listed under the ESA. The Trustees have initiated consultation with the USFWS and NOAA's National Marine Fisheries Service (NMFS) pursuant to the ESA to ensure that the restoration actions selected are in accordance with all applicable provisions. Correspondence with the USFWS and the NMFS is included in the administrative record.

Fish and Wildlife Conservation Act, 16 U.S.C. § 2901, et seq.

The crevasse restoration project will encourage the conservation of non-game fish and wildlife. Both the ecological and recreational projects will have no adverse effects on non-game fish and wildlife.

Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. § 661, et seq.

The FWCA requires that federal agencies consult with USFWS, NMFS, and state wildlife agencies for activities that affect, control or modify waters of any stream or bodies of water, in order to minimize the adverse effect of such actions on fish and wildlife resources and habitat. This consultation is generally incorporated into the process of complying with Section 404 of the CWA, NEPA, or other federal permit, license, or review requirements. The crevasse project will have a positive effect on fish and wildlife resources. The recreation project will not adversely affect fish and wildlife resources.

Magnuson Fishery Conservation and Management Act, 16 U.S.C. § 1801, et seq.

The Magnuson Fishery Conservation and Management Act provides for stewardship of the nation's fishery resources within the Exclusive Economic Zone, covering all U.S. coastal waters 200 miles seaward from the boundary of state territorial waters. The resource management goal is to achieve and maintain the optimum yield from U.S. marine fisheries. The Act also establishes a program to promote the protection of Essential Fish Habitat (EFH) throughout state and federal waters in the planning of federal actions. After EFH has been described and identified in fishery management plans by the regional fishery management councils, federal agencies are obligated to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH.

The Trustees do not believe that the restoration alternatives will have a net adverse impact any Essential Fish Habitat as designated under the Act. The crevasse project is expected to have a positive effect in creating EFH. A determination of this finding was made with NMFS, and this correspondence is included in the administrative record.

Marine Mammal Protection Act, 16 U.S.C. § 1361, et seq.

The Marine Mammal Protection Act provides for the long-term management of and research programs for marine mammals. It places a moratorium on the taking and importing of marine mammals and marine mammal products, with limited exceptions. The U.S. Department of Commerce is responsible for whales, porpoises, seals, and sea lions. DOI is responsible for all other marine mammals. The selected restoration projects will not have an adverse effect on marine mammals.

Migratory Bird Conservation Act, 16 U.S.C. § 715, et seq.

The selected restoration projects will have no adverse effect on migratory birds. Migratory birds will benefit from the establishment of new marsh habitat.

Archeological Resources Protection Act, 16 U.S.C. § 470, et seq.

The Louisiana State Historical Preservation Office will be consulted on the selected restoration projects. At present, the Trustees are unaware of any cultural resources in the area, and no known sites or properties listed on or eligible for listing on the National Register of Historic Places are located near the selected restoration sites.

Executive Order Number 12898 (59 Fed. Reg. 7,629) – Environmental Justice

This Executive Order requires each federal agency to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on ethnic minority and low-income populations. The U.S. Environmental Protection Agency and CEQ have emphasized the importance of incorporating environmental justice review in the analyses conducted by federal agencies under NEPA and of developing mitigation measures that disproportionate environmental effects on minority and low-income populations. The Trustees have concluded that there are no low-income or ethnic minority communities that would be adversely affected by the selected restoration projects.

Executive Order Number 11514 (35 Fed. Reg. 4,247) - Protection and Enhancement of Environmental Quality

The DARP is also an Environmental Assessment as required by NEPA.

Executive Order Number 11990 (42 Fed. Reg. 26,961) - Protection of Wetlands

The crevasse project will help ensure the protection of wetlands and the services they provide. The recreation project will not adversely affect wetlands.

Executive Order Number 12962 (60 Fed. Reg. 30,769) - Recreational Fisheries

The crevasse project will help ensure the protection of recreational fisheries and the services they provide. The recreation project will have no adverse impacts on recreational fisheries.

Executive Order Number 13112 (64 Fed. Reg. 6,183) – Invasive Species

The crevasse project will encourage the spread of native vegetation and will not cause or promote the introduction or spread of invasive species. The recreation project will not cause or promote the introduction or spread of invasive vegetation.

Attachment B

WESTCHESTER Oil Spill Restoration Projects

Statement of Work

I. Introduction

This WESTCHESTER Oil Spill restoration Statement of Work ("SOW") sets forth a plan for the restoration projects referred to in Section V of the consent decree in United States and the State of Louisiana v. Marine Oil Trader 3, Ltd., and ERMIS Maritime Corp. This SOW is incorporated into, and is a requirement of, the Consent Decree.

The Settling Defendants shall complete the Splay Marsh Restoration Project and the Boat Dock Restoration Project, as described below. The Settling Defendants shall construct, implement and complete each of these projects accordance with the terms of the Consent Decree, including the terms of this Attachment, and the details and requirements of all applicable permits including, but not limited to, permits issued by the Louisiana Department of Natural Resources.

II. Splay Marsh Restoration Project

1. Description. Settling Defendants shall obtain all necessary permits and create a splay marsh by cutting a crevasse in the bank along South Pass, in the Pass-a-Loutre State Wildlife Management Area (PAL), in Plaquemines Parish, Louisiana. Settling Defendants shall obtain prior approval from PAL representatives as to where construction takes place, what equipment is to be used in construction, and time periods for construction.
2. Timing. Settling Defendants shall apply for all necessary permits within 30 days of entry of the Consent Decree. Settling Defendants shall complete construction of the crevasse (i.e., dredging of the channel, and any extension cut¹ deemed appropriate) within 180 days of obtaining all necessary permits, or 180 days after the day of entry of the Consent Decree, whichever is later. Upon completing construction of the crevasse, Settling Defendants shall provide notice to the Trustee Council, in accordance with Paragraph 7(E) of the Consent Decree.
3. Location and Size of Crevasse. Unless modified by an applicable permit, Settling Defendants shall cut the crevasse, and any extension cut, at Lat: 29°02'42", Long: 89°11'58", as depicted on Exhibit 1. The crevasse shall be cut in a manner to establish a channel no larger than 70 feet wide, and 470 feet long on the northern border and 467 feet long on the southern border, as

¹ An "extension cut" is an additional channel or "cut" that may be dredged beyond the limits of the designated crevasse. Such an "extension cut" may be made, at the discretion of the Settling Defendants and the Louisiana Department of Natural Resources, in order to improve the likelihood of success of the created splay marsh.

depicted on Exhibit 2. The crevasse must be cut in conformance with all applicable permit requirements, and in a manner approved by the Trustee Council as likely to achieve the project objectives. The spoil material shall be deposited continuously along the channel created by the crevasse, in accordance with applicable permit requirements.

4. Marsh Creation. The Settling Defendants shall design the crevasse so as to cause a splay marsh to develop in the receiving bay. In order for the splay marsh to develop, the crevasse must remain open (as defined in Paragraph 6(c)(2)), with the advancing edge of the splay made up of plants such as *Sagittaria*, and the older sections composed of marsh vegetation such as *Scirpus*. Vegetation must colonize and form a splay marsh of at least 4.7 acres in size over the course of a period of 3 years after the crevasse is cut.

5. Extent of Marsh. The Settling Defendants shall design the crevasse so as to cause a splay marsh to develop at a rate of 1.57 acres per year. Three years after the date the crevasse is constructed, the created splay marsh must be at least 4.7 acres in size.

6. Performance Criteria and Monitoring. Post-implementation monitoring will be performed by the Settling Defendants, and overseen by the Trustee Council, at the Settling Defendants' expense. The monitoring program will be designed by the Settling Defendants, and approved by the Trustee Council, to determine objectively whether the project goals and objectives are being achieved. Monitoring data will help both the Settling Defendants and the Trustee Council assess the performance, viability, and stability of both the crevasse and the resulting marsh. Monitoring will also allow the Settling Defendants and the Trustee Council to determine whether corrective actions must be undertaken to meet the restoration project's goals and objectives. Project performance will be assessed, at least in part, by comparing quantitative monitoring results to pre-determined performance criteria and pre-construction survey and assessment information. Any performance criteria identified, in addition to those listed below, will be developed by the Settling Defendants and approved by the Trustees, as a means to defining the minimum necessary physical and structural conditions of the project.

a. *Pre-Construction Assessment:*

Prior to construction, the Settling Defendants shall submit to the Trustee Council: (1) a written site description, providing the general physical and environmental conditions at the site; (2) the results of initial aerial photography, including a delineation of the extent of the existing marsh at the project site²; and (3) a bathymetric survey of the receiving basin.

b. *Post-Construction Monitoring:*

(1) Within 30 days of the Construction Completion Certificate Date (as provided for in Paragraph 7 of the Consent Decree), the Settling Defendants shall submit to the Trustee

² All aerial photography must be conducted in a manner suitable to providing a reasonably accurate geographic and spatial interpretation of the extent of vegetative cover.

Council a written post-construction report, providing the actual dimensions (i.e., width, length, and depth) of the dredged crevasse, as well as any extension cut made. Width and depth shall be measured at a sufficient number of locations to achieve a statistically valid interpolation of the depth of the crevasse.

(2) Each year, for three years following the Construction Completion Certificate Date, Settling Defendants shall monitor the project site to assess the project's success and the rate of marshland growth, and to identify the need for early corrective actions.

Specifically, each year, Settling Defendants shall

- (i) delineate, using aerial photography, the extent of the new emergent splay marsh;
- (ii) visit the project site and (a) determine the actual dimensions of the actual dimensions (i.e., width, length, and depth) of the dredged crevasse, as well as any extension cut made; (b) confirm the assumptions and conclusions made as part of the aerial photographic delineations, accompanied by a representative or representatives of the Trustee Council; (c) document the variety of vegetative species observed in the newly created marshland; and (d) document the variety of fauna observed of the newly created marshland; and
- (iii) submit a written report to the Trustee Council containing the information described in (6)(b)(1) and (2) and, at the request of the Trustee Council, copies of all field logs, data sheets, aerial photography, and raw and processed data, within 30 days of such request.

c. Performance Criteria:

The performance criteria identified below specify the minimum physical and structural conditions of the crevasse and the resulting marsh that will be deemed to represent acceptable growth and development. Three years after the Construction Completion Certification Date:

(1) at least 4.7 acres of vegetated splay marsh that did not exist at that location prior to the establishment of the crevasse must be measurable.

(2) the dredged crevasse must remain "open", such that sediment-rich water may still flow freely from South Pass into the developing marshland area. The crevasse will be considered "open" if (i) the crevasse channel has not filled in more than 50 percent of its initial depth, (ii) the extension channel in the receiving bay has not filled in more than 75 percent of its initial depth, and (iii) there are no obstructions in the channels or bay that, in the judgment of the Trustee Council, could prevent the projected growth of the splay marsh.

(3) emergent plant species characteristic of splay marshes, such as *Sagittaria* and *Scirpus*, must populate the newly created marsh at the end of three years.

7. Corrective Actions.

(a) "Corrective Action" means any action that the Trustee Council deems necessary to ensure the success of the project.

(b) If, at any point during the 3-year monitoring period, the Trustee Council determines that corrective actions may be necessary, the Trustee Council may require Settling Defendants to undertake such corrective actions. The Trustee Council may require Settling Defendants to submit a report, within 45 days, recommending appropriate corrective actions to be undertaken by the Settling Defendants. Settling Defendants may also submit such recommendations to the Trustee Council in the absence of a request for such a report at any point during the 3-year monitoring period. Prior to implementing any corrective action, the Settling Defendants must obtain approval from the Trustee Council of such action. Settling Defendants shall undertake any required corrective actions at their expense, and in accordance with a schedule determined by the Trustee Council.

(c) If, at the end of the 3-year monitoring period, the Trustee Council determines that one or more of the performance criteria are not satisfied, the Trustee Council may require corrective actions to be undertaken by Settling Defendants. Examples of corrective actions that may be required to ensure growth of the marsh at the required rates include: extending the monitoring period beyond 3 years to determine whether the project achieves predicted trends in growth; re-dredging the crevasse; and dredging a new crevasse. Settling Defendants shall undertake any required corrective actions at their expense, and in accordance with a schedule determined by the Trustee Council.

(d) If corrective actions are required after the completion of the 3-year monitoring period, the deadline for project certification will be extended an additional year for every corrective action undertaken. During such period of extension, Settling Defendants must perform the annual monitoring described above.

8. Project Completion. When the Trustee Council determines that the above performance criteria, and any additional identified corrective actions, have been satisfied, this restoration project will be considered complete for purposes of this Consent Decree.

III. Boat Dock Restoration Project

1. **Description.** Defendants shall construct a dock at the Freshwater Reservoir on PAL that will improve access to this area. The specific design of the dock is being developed by PAL personnel, and is subject to approval by the Trustee Council. Settling Defendants shall obtain prior approval from PAL representatives as to where construction takes place, what equipment is to be used in construction, and time periods for construction.

2. **General Objectives.** Because fishing and hunting are prime uses of PAL, the objective of this project is to enhance access to an unimproved area that is often used as a campground by anglers and hunters and increase the overall recreational use of this area.

3. **Timing.** The Settling Defendants shall complete the construction of the Boat Dock Restoration Project (as provided in Paragraph 7(E) of the Consent Decree) within 180 days of obtaining all necessary permits, or 180 days after the day of entry of the Consent Decree, whichever is later.

4. **Design.** Unless modified by PAL personnel and approved by the Trustee Counsel, the dock shall be designed and constructed in materials appropriate for a marine environment in compliance with the plans in Exhibit 3. The dock shall be designed to withstand a direct hit by tropical storm force winds (34 to 73 miles per hour) at the site. The dock shall be constructed of treated wood pilings with treated wood decking on top.

5. **Performance Criteria.** The Settling Defendants shall implement the construction of the Boat Dock Restoration Project according to the construction details, as they are set forth in Exhibit 3, and any modifications thereto made by PAL personnel and approved by the Trustee Council.

6. **Corrective Actions.** The Trustee Council may require corrective actions to be undertaken by the Settling Defendants if the performance criteria are not satisfied, in accordance with Paragraph 7(F) of the Consent Decree.

7. **Reporting.** Settling Defendants shall submit a notice of completion, as provided for in Paragraph 7(E) of the Consent Decree. Settling Defendants shall also notify the Trustee Council prior to making any material modification to the plans set forth in Exhibit 3.

WESTCHESTER INCIDENT
RESTORATION PROPOSAL
OF THE RESPONSIBLE PARTY

The Responsible Party proposes to conduct two projects. At their completion, as defined below, these two projects will comprise complete and final compensation for the WESTCHESTER Oil Spill of 28 November 2000 in the Mississippi River, near Port Sulfur, Louisiana.

The proposals have been developed with the trustees for the natural resources affected by the incident as identified in the Oil Pollution Act and the National Contingency Plan (the trustees). The proposals are consistent with the objectives and scale of the injury as detailed in the Final Damage Assessment /Restoration Plan and Environmental Assessment prepared by the trustees dated December 21, 2001

Construction of Recreational Dock

The Responsible Party proposes to construct a dock suitable for recreational use. The dock will provide access to uplands near the freshwater reservoir adjacent to Cadro Pass in the Mississippi Delta, State of Louisiana (Attachment 1). The dock will be constructed of timbers on wood pile in the dimensions of 50 ft. long x 7 ft. wide as depicted in the construction drawings in Attachment 2 and in the complete engineering drawings submitted to the trustees in January 2002. The dock will be fitted with a ramp connecting it with the filled uplands of the freshwater reservoir between South Pass and Dennis Pass.

The Responsible Party has engaged a professional engineer to design the project, which meets the approval of the Louisiana Department of Fish and Wildlife. Construction drawings have been prepared and supplied to the trustees. The project will be constructed by contractors on behalf of the Responsible Party and become the property of the Louisiana Department of Wildlife and Fisheries. Completion of construction will serve as the end point of the Responsible Party's involvement in this project. The Responsible Party will work with the trustees and the trustees will work with the Responsible Party to secure permits for the project. A proposed Work Plan/Schedule is included as Attachment 3.

Crevasse Excavation and Splay Marsh Development

The Responsible Party proposes to excavate a perpendicular crevasse or channel through the southwest bank of South Pass, Mississippi Delta, State of Louisiana. Approximate location of the project is latitude N 29°02'42", longitude E 89°11'58", T24S – R32E in Plaquemines Parish, Louisiana (Attachments 1 and 4). The Responsible Party will fund the excavation of a sediment diversion approximately 70 ft. wide and of sufficient length to allow free communication between South Pass and the waters to the southeast of the existing berm. Excavation will be by bucket or dragline and the spoil will be sidecast within 70 feet each side of the crevasse.

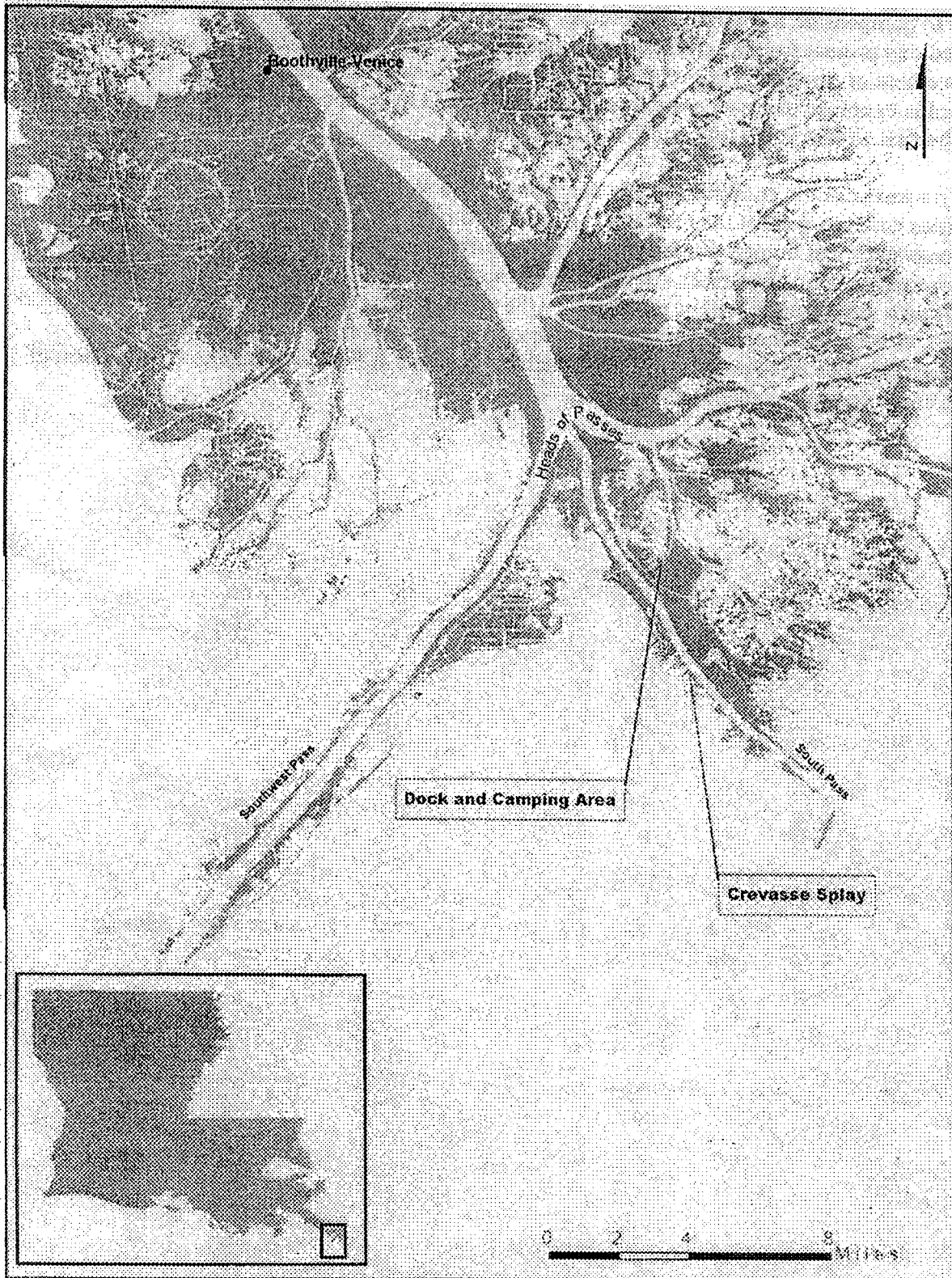
The Responsible Party has conducted Time₀ aerial photography in February 2002 (Attachment 5). The proposed project was developed with the input, advice and design recommendations of the Louisiana Department of Wildlife and Fisheries as shown in Attachment 6. The Responsible party has performed hydrographic and topographic surveys of the site in February 2002, which were used in development of the project design as shown in Attachment 7.

The Responsible Party will assist the State of Louisiana in acquiring necessary permits to be modified from existing permits held by the State for this project. A proposed Work Plan/Schedule is included as Attachment 3. The schedule is dependant upon timely permit review and approval.

The primary objective of the project is to create new emergent splay marsh of a minimum of 4.7 acres by the end of the third year following construction. Monitoring will allow the trustees and the Responsible Party to determine whether corrective actions are required to meet the restoration objectives. Monitoring will be conducted using aerial photography and site visits. The February 2002 photos establish the baseline acreage prior to construction. Annual monitoring via scaled aerial photography will be taken once per year for the following three years. Changes in area of splay marsh from Time₀ will be quantified by comparison of scaled digital images and delineated using the off-site methodology described in Wetlands Delineation Manual, Environmental Laboratory, US Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi, 1987. Additional monitoring will not be required if the project meets the required performance criteria at the end of the three year period. The specific performance criteria are that there be at least 4.7 acres of vegetative splay marsh, the crevasse remain open (the crevasse depth less than 50% filled in, the extension into the open water less than 75% filled in, and no obstructions in the crevasse or extension that might inhibit future splay growth), and that plant species characteristic of splay marshes are present at the end of three years. If the performance criteria are satisfied at the end of the three-year monitoring event the project will be considered a success. Should one or more of the performance criteria not be met, corrective action will be considered by the Responsible Party and trustees to remedy the situation. Corrective actions to be considered include: waiting for an additional period of time to see if the project begins to match predicted growth trends, reopening the crevasse, opening a new crevasse, or other actions agreed upon that would correct the deficiency and ensure growth at the required rates.

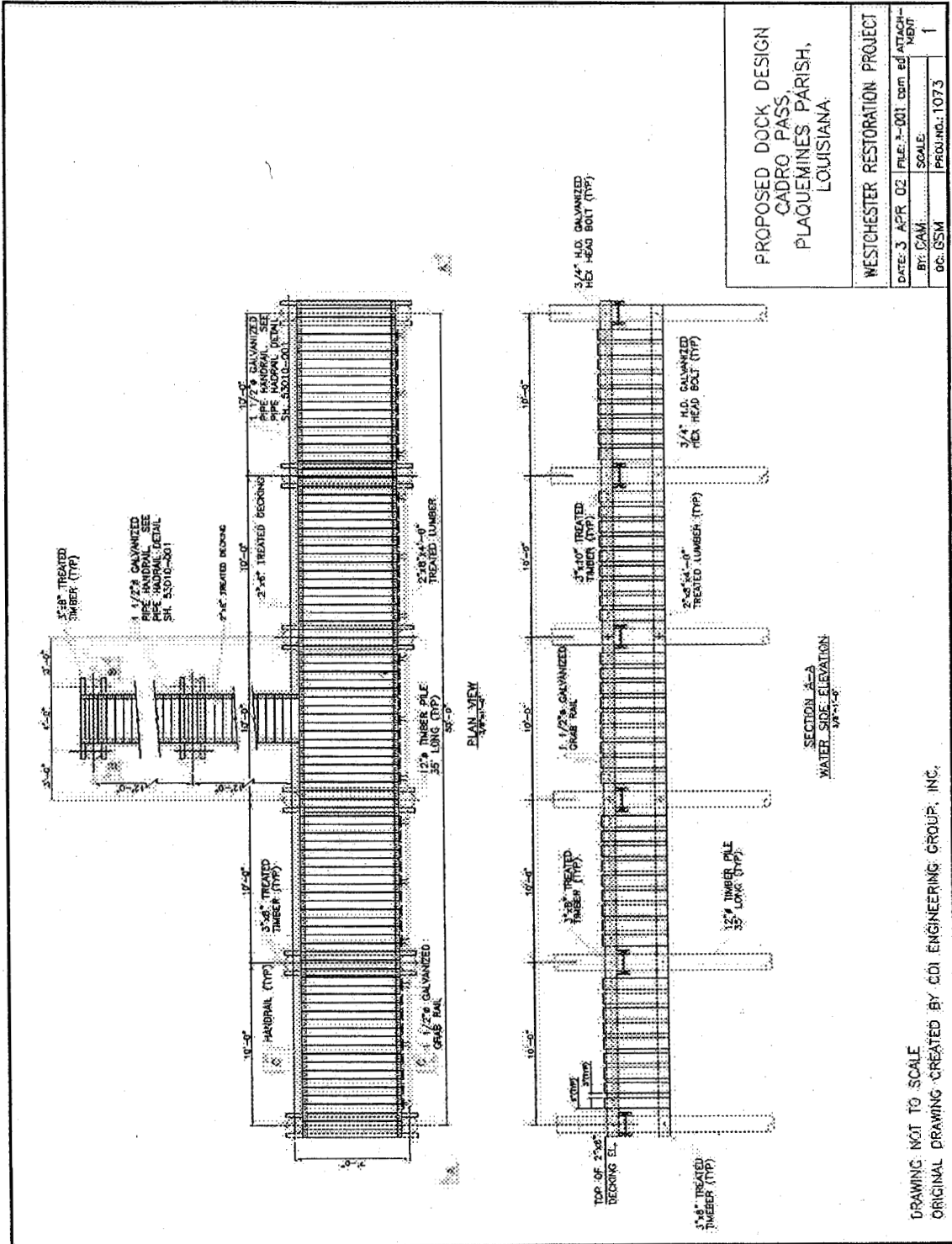
ATTACHMENT 1

GENERAL LOCATION MAP



ATTACHMENT 2

PROPOSED DOCK DRAWINGS



PROPOSED DOCK DESIGN
CADRO PASS,
PLAQUEMINES PARISH,
LOUISIANA

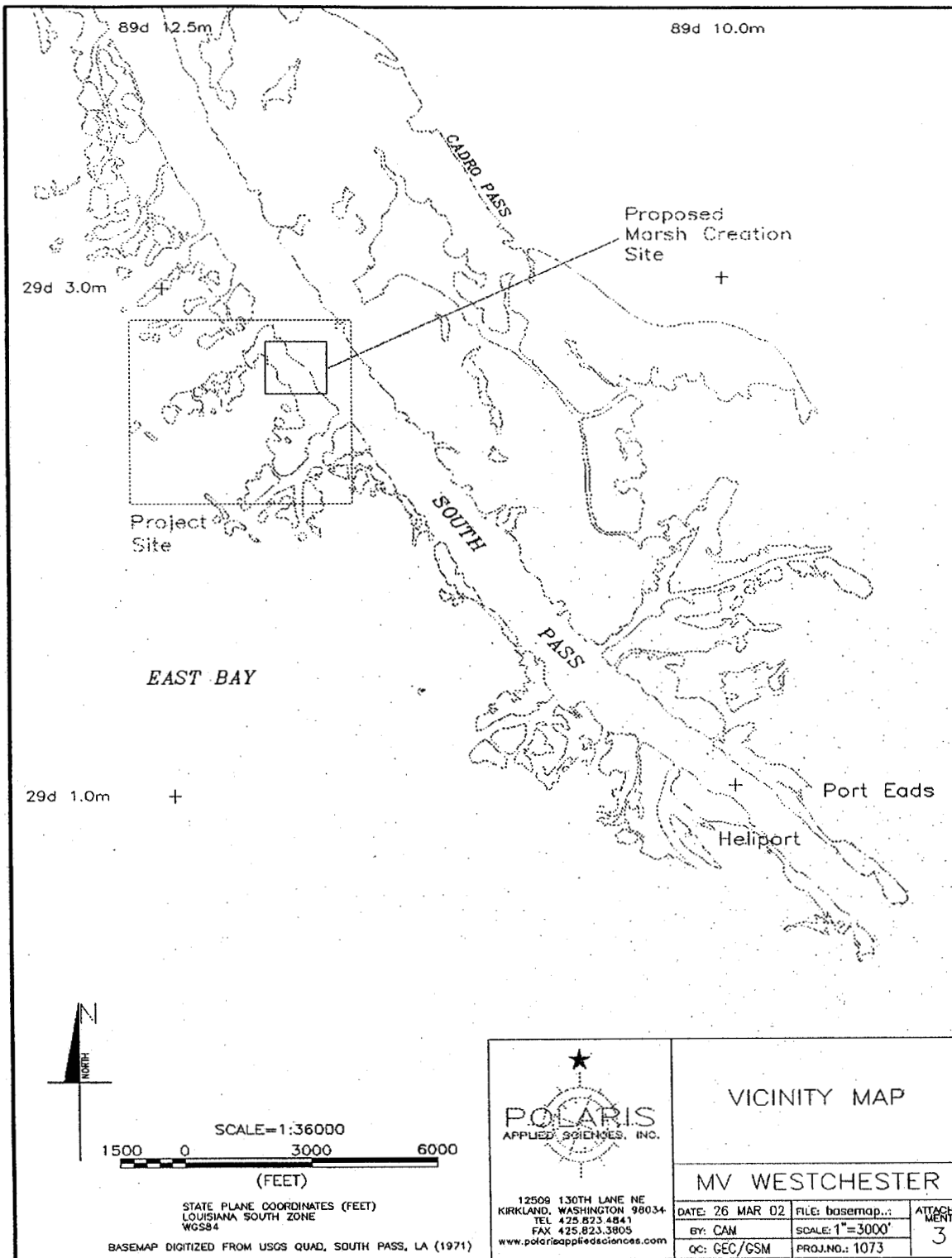
WESTCHESTER RESTORATION PROJECT

DATE: 3 APR 02	FILE: 1-001.dwg	ATTACH- MENT	
BY: CAM	SCALE:		
DC: GSM	PROJECT NO: 1073		1

DRAWING NOT TO SCALE
ORIGINAL DRAWING CREATED BY CDI ENGINEERING GROUP, INC.

ATTACHMENT 4

LOCATION OF PROPOSED CREVASSE PROJECT

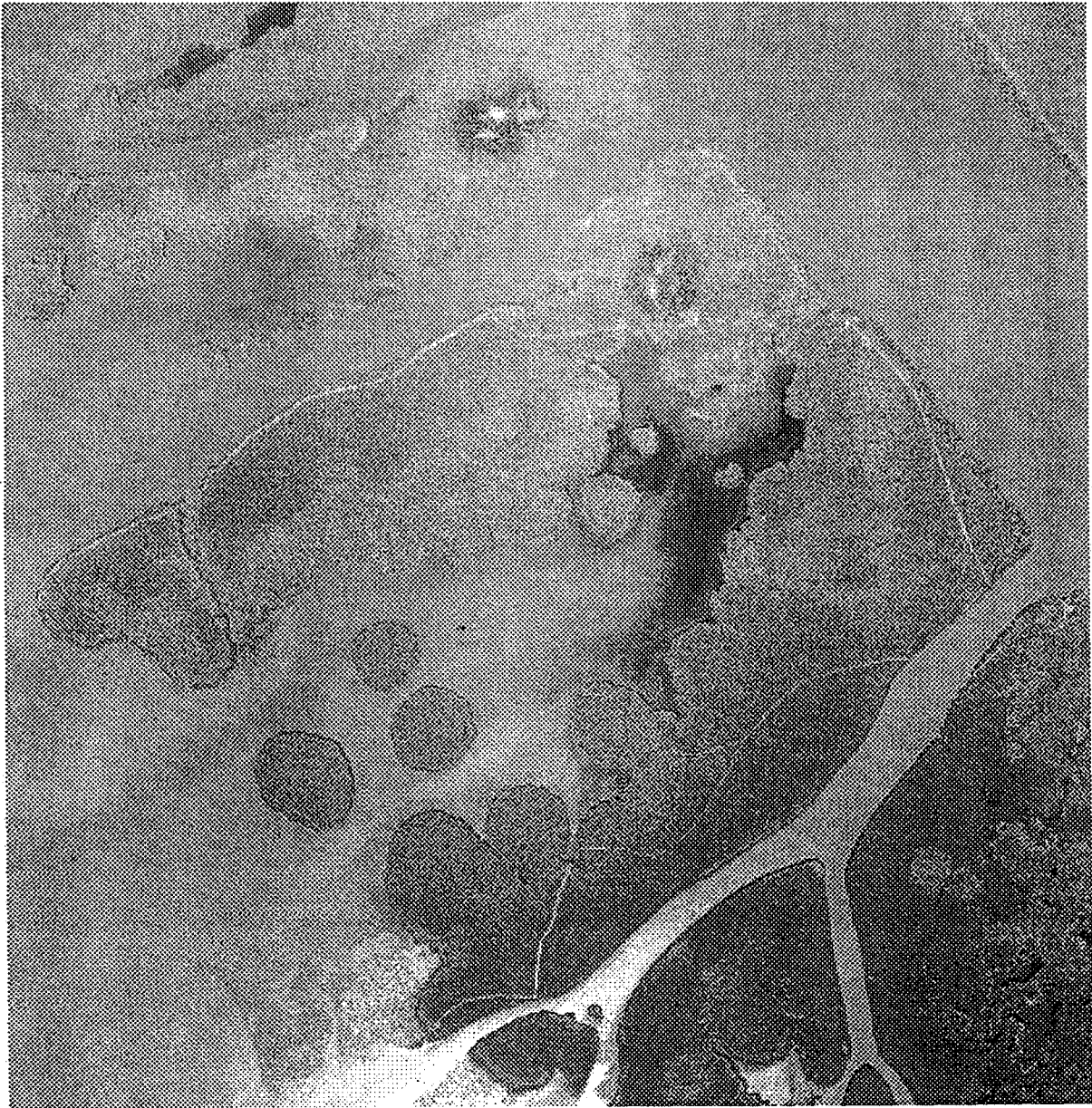


ATTACHMENT 5

ORTHORECTIFIED INFRARED AERIAL PHOTO OF PROJECT SITE

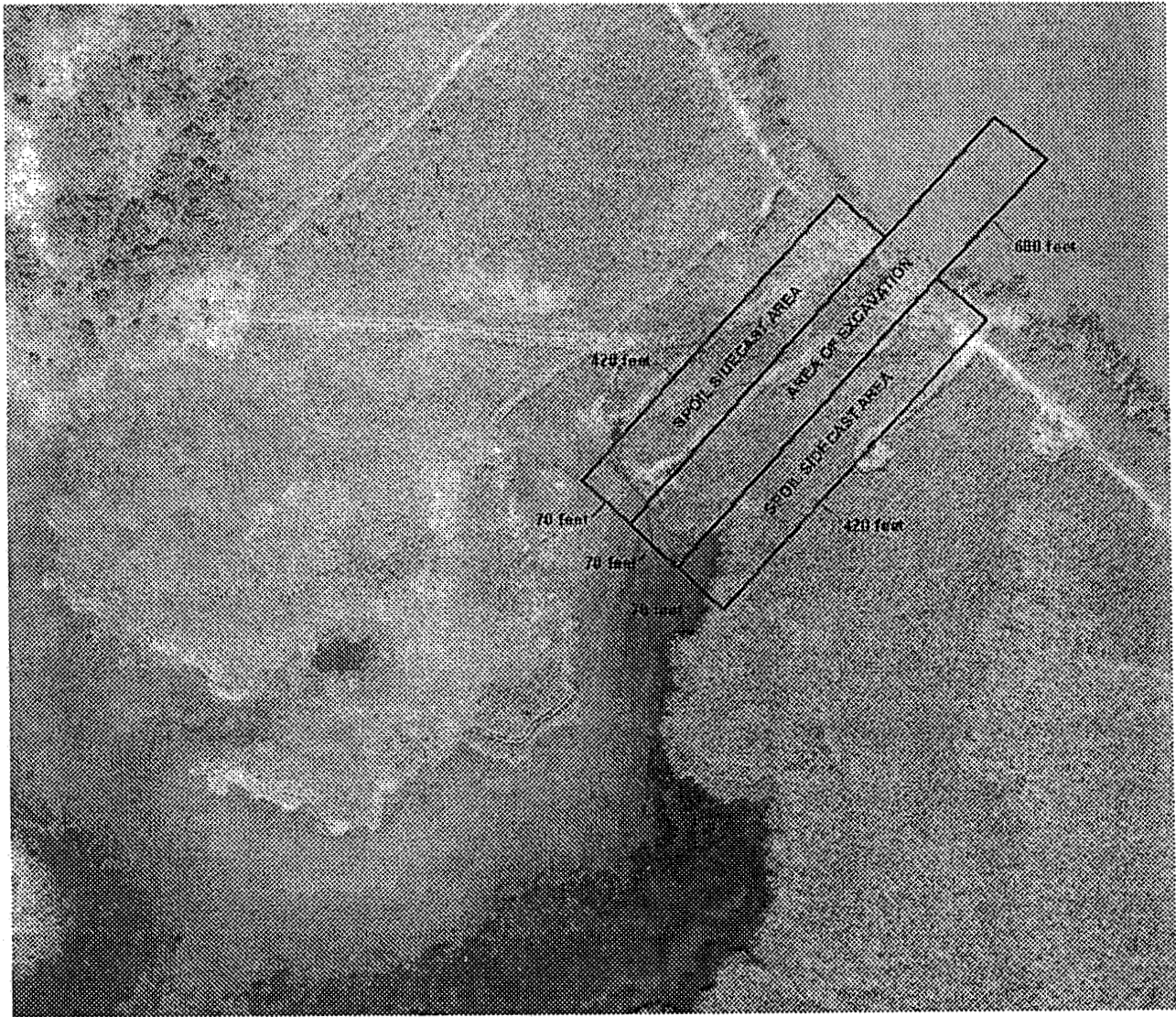
Flown 14 February 2002

Pixel size = 0.3 feet



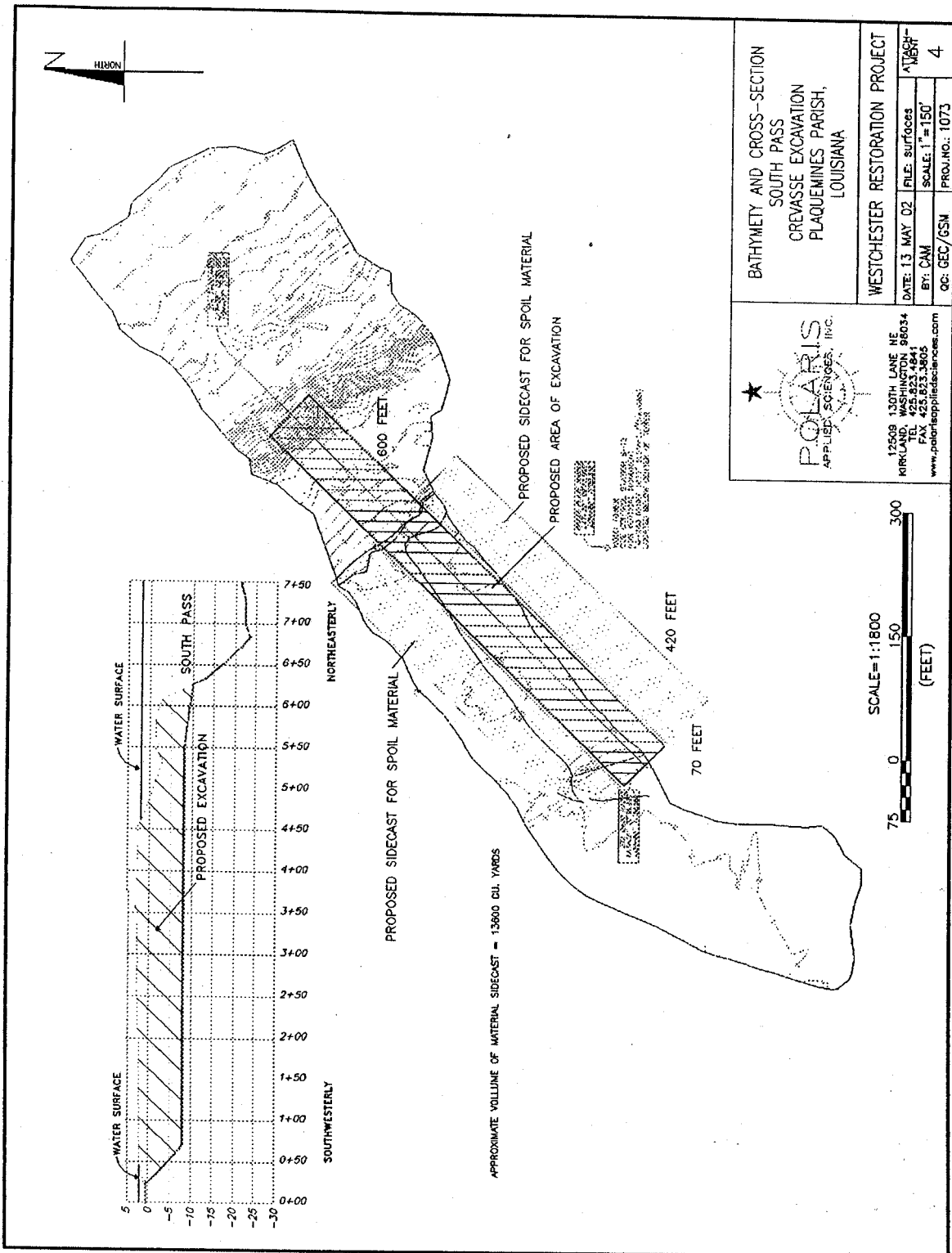
ATTACHMENT 6

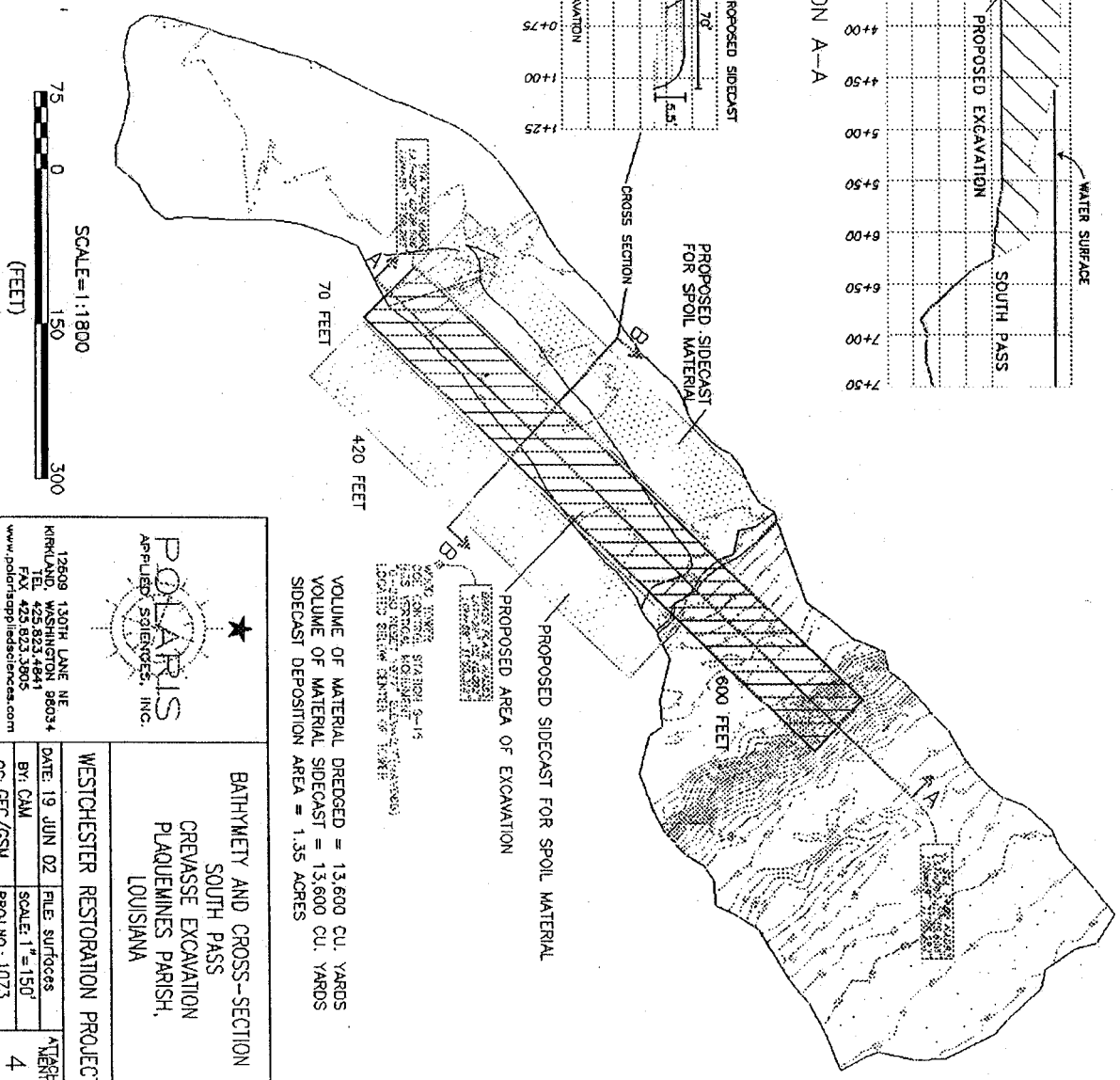
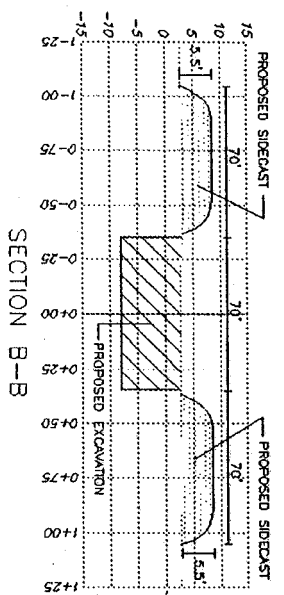
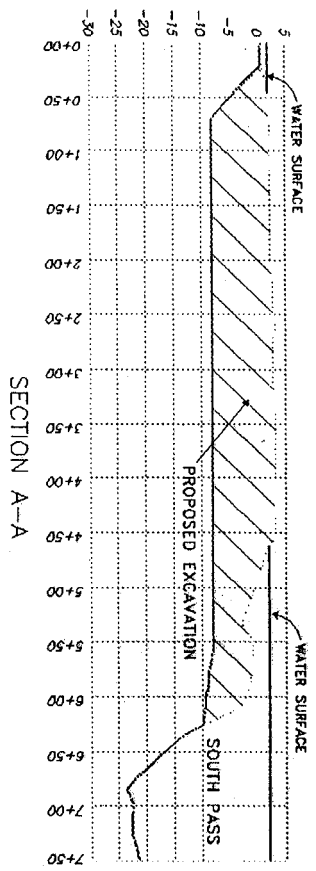
PLAN VIEW OF PROPOSED SOUTH PASS CREVASSE PROJECT



ATTACHMENT 7

SITE BATHYMETRY AND PROPOSED PROJECT CROSS-SECTION





VOLUME OF MATERIAL DREDGED = 13,600 CU. YARDS
 VOLUME OF MATERIAL SIDECAST = 13,600 CU. YARDS
 SIDECAST DEPOSITION AREA = 1.35 ACRES

POLARIS
 APPLIED SCIENCES, INC.

12609 130TH LANE NE
 KIRKLAND, WASHINGTON 98034
 TEL. 425.823.4841
 FAX 425.823.2905
 www.polarisappliedsciences.com

BATHYMETRY AND CROSS-SECTION
 SOUTH PASS
 CREASSE EXCAVATION
 PLAQUEMINES PARISH,
 LOUISIANA

WESTCHESTER RESTORATION PROJECT

DATE: 19 JUN 02	FILE: surfcees	ATTACH-
BY: CAM	SCALE: 1"=150'	MAP-
QC: GEC/GSM	PROJ. NO.: 1073	4