

**Site Information and Spill Response Strategy (SISRS) and the SISRS Database: California's Approach to Marine Oil Spill Protection Planning and Response for Sensitive Sites**

**Carl Jochums  
California Department of Fish and Game, OSPR  
1700 K Street, P.O.Box 944290-2090  
Sacramento, CA 95814  
cjochums@ospr.dfg.ca.gov**

## INTRODUCTION

The SISRS approach is California's method to assess potential oil spill hazards and responses for locales having high ecological sensitivity. It includes an information collection format, a site visit (survey) during which the expertise of multiple interests are incorporated in the information collected, and a database which enables relatively easy access to, and use of, that information to produce Port Area Contingency Plans (ACP) and spill response documents. This paper presents this tool in its historical evolution to show why this process was adopted and how it provided continuity in oil spill contingency planning. The SISRS process has long been applied through a subcommittee of the USCG Port Area Committees. The SISRS database is a recent advancement to mirror the paper format while adding flexibility and capability, and making the information more available for public and private contingency plan writers. The database also allows the most current information to be available to spill responses and response management forms and systems. From the database, there are multiple outputs and connections to other digital systems such as GIS, other databases, and third party software.

## BACKGROUND TO THE AREA PLAN DEVELOPMENT AND USE IN CALIFORNIA

The SISRS approach was borne out of the forces and mandates that have driven oil spill preparedness and response and the need for consistency in California. This background provides a useful introduction to this oil spill planning and response tool and the conditions influencing the development of the SISRS form, survey, and database.

At about the same time as the Exxon-Valdez oil spill in Alaska, California experienced a major oil spill, the American Trader Spill. Both of these spills stimulated legislation: California Senate Bill 2040 - Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 (SB 2040) paralleled the Federal Law, Oil Pollution Act of 1990 (OPA 90). While OPA 90 invested responsibility for marine oil spills in the US Coast Guard, SB 2040 entrusted marine oil spills to California's traditional spill responder and pollution enforcer, the California Department of Fish and Game (DFG), by creation of the Oil Spill Prevention and Response Office within the Department. (Later the scope and name of the

organization were broadened to Office of Spill Prevention and Response (OSPR)).

The California State Legislature selected the California Department of Fish and Game as the lead for oil spill prevention and response for a variety of reasons. Foremost among those reasons were the Department's Constitutional trusteeship for fish, wildlife, invertebrate and sensitive plant resources and the Department's historic oil and pollution laws in the Fish and Game Code and vigorous pollution enforcement. Consequently, the Department already had enforcement personnel (Fish and Game Wardens) and pollution laboratories appropriate for enforcing the criminal and civil sanctions of the SB 2040 legislation.

SB2040 mandated oil spill contingency planning for the State. Though the California legislation was less specific than the Federal legislation about how this was to be accomplished, the (then) OSPR Administrator Pete Bontadelli, deemed the Federally mandated ACP process the best approach, and reached a Memorandum of Agreement with USCG to co-chair the Port Area Contingency Committees. In this USCG-OSPR joint effort to produce Port Area Plans, the division of labor placed responsibility for ecological and wildlife issues in OSPR/DFG through the chair roles of Sensitive Site and Strategy Development Subcommittees in the six Area Committees. This responsibility was distributed to the ten environmental specialists (marine biologists, ecologists, and toxicologists) representing the California Department of Fish and Game, OSPR in the field from San Diego in the south to Eureka in the north. (The high-volume ports have several staff to deal with the workload: LA-Long Beach has two and San Francisco has three). This was a good arrangement, since it resulted in a uniform approach to sensitive site identification and protection strategy development, which was (and is) one of the challenges facing oil spill contingency planners in California.

One of the major issues facing oil spill response planners was consistency for California's elaborate coastline. Though the direct distance from Oregon to the Mexican border is less than 1000 miles, the total length of California's convoluted shoreline, including bays and inlets, is several times greater (5300 to 7300 miles). The habitats along this coastline vary dramatically from rugged rocky cliffs of the north coast to the sandy beaches of southern California to the saltwater and freshwater marshes of the estuaries. Furthermore, there are multiple Federal jurisdictions including three USCG Captain of the Port Zones. Consistency is an issue in identifying the locales meriting distinction as sensitive sites and how protection strategies should be prepared for each.

To achieve a uniform approach identifying sensitive locales, the DFG/OSPR environmental specialists (OSPR biologists) met among themselves and then with Federal Trustees (NOAA Hazmat, NOAA Sanctuaries, National Park Service, US Fish and Wildlife Service) to develop a rationale to evaluate proposed sensitive sites. Ultimately, criteria were developed to qualify sensitive sites and differentiate their levels of sensitivity based on ecological issues (and irrespective of ownership or agency interests).

The OSPR biologists also recognized the need for consistency in the process of site documentation and strategy development. As they met, each bringing the concerns and needs in their respective geographical area and the information that each believed was essential for inclusion, it became clear that a consensus was needed in order to provide uniformity. Eventually, a format, the SISRS form, was developed and refined to gather specific information about each site and to develop site protection strategies. They also recognized the need for wide involvement of stakeholders and the need for a consensus for strategy development. So, the information and strategies were to be developed using site visits coordinated through the Sensitive Site and Strategy Development Subcommittees, hence, the SISRS survey.

The Subcommittees planned and advertised the SISRS surveys. They identified stakeholders, invited them, and encouraged wide attendance. In addition to DFG/OSPR and USCG oil spill response planners, SISRS survey attendees often included Federal trustees, land owners, representatives from interested state, federal, and local agencies, oil spill response companies and co-ops, consultants, oil industry, and environmental groups. In this on-site forum, trustees and environmentalists had an opportunity to identify and share their concerns as well as the protection response they hoped to see. In turn, industry and response representatives presented their capabilities and the limitations of existent technology. With these expectations and capabilities in mind, the survey team derived a consensus of the appropriate strategies for site protection. This approach engendered wide participation in SISRS surveys and wide approval of site protection strategies by stakeholders. Eventually, the SISRS form and survey became the backbone of strategy development and information collection for California ACPs.

In 1998, OSPR recognized the trend toward digital contingency plans and third party spill response management software. To accommodate this trend, OSPR made a commitment to convert all site information into a digital format through the development of the SISRS database (using Microsoft Access). This database held the promise of a new era in spill contingency planning and response. Information in a digital format is more easily updated and available for use. In 1999, the SISRS database was first used to produce portions of the year 2000 Area Plans. The remainder of this paper describes the current SISRS process and content, how that digital information is used to prepare Area Contingency Plans, and how it is used in spill response.

## THE SISRS AND THE SENSITIVE SITE CONTINGENCY PLANNING PROCESS

This is the current sequence of Area Committee actions using the SISRS process in the San Francisco Port Area (other Port Area Contingency Committees have abbreviated this process in various ways).

1. Candidate sites proposed to the Area Committee are reviewed by the Sensitive Site and Strategy Development Subcommittee and referred to the

trustees for approval. For a site to be considered, ecological resources must be both vulnerable to oiling (or collateral cleanup impacts) and be sensitive to spill impacts. The trustees consider a candidate site using the sensitivity criteria to determine what distinguishes a particular locale as meriting distinction as a sensitive site. Those criteria are as follows:

Category A - Extremely Sensitive:

Wetlands, estuaries and lagoons with emergent vegetation (marsh-riparian Environmental Sensitivity Index 10 (ESI 10)); sheltered tidal flat (ESI 9); and habitats for rare, threatened or endangered species (state or federal); sites of significant concentrations of vulnerable and sensitive species (e.g. pinniped pupping)

Category B - Very Sensitive:

Major pinniped haulout areas during non-pupping seasons;  
Moderate concentrations of vulnerable and sensitive species; other low energy habitats (ESI types 8A, 8B, 7 and 6B)

Category C - Sensitive:

Higher energy habitats (ESI 6A through 1) for example: Habitats important to large numbers of species of sport, commercial value, and scientific interest or species experiencing significant population declines though not yet threatened.

2. The Subcommittee schedules a SISRS survey to complete approval of sites and to develop site protection strategies. Since wide participation is key to success, stakeholders are identified and invited to attend. During the SISRS survey, the SISRS team collects site information and seeks a consensus on tentative strategies on-site.

3. The team leader, usually an OSPR biologist, summarizes the information and strategies. Data are entered into the SISRS database. Draft documents are generated from the database:

A) a **Site Summary** page which describes the ecological, cultural, physical, geomorphological, and key contact information about the site; and

B) a **Site Strategy** page, which includes the directions to the site, hazards identified, protection and injury concerns at the site, site strategies, equipment lists, and access and logistical considerations.

4. The drafts are reviewed and approved by the Subcommittee.

5. Proposed sites and strategies are submitted to the Area Committee for final review, and upon approval, they are slated for publication in the next Area Plan revision.

## THE SISRS FORM

The SISRS form is a four-page document. (A copy is attached.) The effect of the SISRS form is that it focuses the view of spill response planners through a single lens. OSPR biologists and other spill strategists evaluate sensitive locales in a uniform manner. This brings consistency to characterizing the site, devising protection strategies, and preparing ACPs.

The first page of the document generally characterizes the site and orients the reader. The intent is to give someone who has never visited the site a

reasonable preconception of it. The document includes a description of how to go to the site, a delineation of site boundaries, and a synoptic description of the site including its biology, general situation and proximal location, map and chart references, and ownership issues, if any. A section is devoted to classifying site geomorphology using the NOAA Environmental Sensitivity Index types. There is also a section for surveyors to record hazards that might affect response to the site. Human uses are detailed, including buildings, wharfs, structures, and recreational uses. Finally, there is a listing of persons having special knowledge of the site or resources found at the site and a bibliography regarding the site. This single page can be used to capture a plethora of information to enable responders to make educated decisions without first-hand site familiarity.

The second page is devoted to capturing information regarding sensitive site resources that could be adversely impacted by oil or collaterally injured in response. This page is intended to provide a scientifically accurate description of the ecological character and biota present with special attention to rare and endangered species. The goal is to identify those resources that are of particular concern and sensitivity to oil and/or cleanup impacts, as opposed to an exhaustive list of species present. Headings include: Habitats at Risk; Marine Mammals and Terrestrial Mammals; Subtidal/Aquatic Resources including Fish; Intertidal Biota; Submerged and Emergent Flora; and Land Flora. A section is provided to allow biologists to indicate if there are seasonal periods of greater sensitivity, such as breeding, spawning, or wintering periods. Finally, a section is provided to indicate if there are cultural or historic sensitivities associated with the site and who can provide expertise for them.

The third page is for spill response and strategy development. There are two main purposes of this page. The first is to clearly articulate the impact concerns in order to guide spill responders: exactly what the strategies are intending to protect and how the site could be injured as a consequence of the response. The second purpose is to define site protection strategies, including equipment needed. The form allows response planners to write multiple strategies and describe the conditions under which each should be used. This is important since it is often the case that a single strategy may not be appropriate for the varied conditions or routes of threat that may occur at a site. The form allows for three strategies (or substrategies), e.g., one for ebb tide, one for flood tide, one for an inland threat, etc. By conditionalizing strategies, response planners can prepare for multiple foreseeable impact scenarios. This page also calls for an assessment of beach pre-cleaning needs, oil stranding consequences, and background oil occurrence.

The last page addresses logistical considerations: staging, accessibility, and communications. Staging includes the recommended sites for staging the site protection equipment, and the kinds of support facilities present. Accessibility focuses on traffic or transport limitations to the site, both by water and by land - for example, does steep terrain restrict vehicle options, or do obstructions or shallows limit boat access? Also, where vessels could be launched or supported for response. Communications are assessed to

determine if traditional communications are feasible at the site: cell phones, pagers, and radio.

## THE SISRS DATABASE

The concept of the SISRS database is to make ACP site protection information easily updateable and more available for wider use. This is accomplished by mirroring the SISRS form in appearance and flexibility and using the information include to directly generate the ACP Site Summary and Site Strategy pages. As a result there is a direct correspondence between database information and ACP pages. Once this relationship between database and ACP document is active, the database is available to both response planners and spill responders to meet both planning and response needs. To increase database availability to local area committees and responders, the databases are decentralized rather than centralized: there are six databases in the state corresponding to local ACP planning groups. Each database is maintained by the local OSPR biologist. This local database system enhances the ease of information update and use by local area committees. Without this interface it is very difficult to keep up with lessons learned or changes (such as key contact turnover or phone and address changes.)

To facilitate usefulness, the database has a graphical interface. Users can view the of the port region that is covered by the database, and sensitive sites are identified on the view. Users can address site information by point-and-click, either to view site information or to include sites in a spill response. By double clicking on a site icon, the user can view and update site information in either the SISRS form or the ACP page format. Since most strategies in the Area Plan have supporting strategy diagrams, these too are stored in database, and are available as output to the ACP or for spill response. Other supporting graphics are often included such as USGS coverage, NOAA charts, access maps to the site, aerial views or other photos. In this respect, the database exceeds the capability of the ACP to provide key perspective and background which is especially useful at the time of a spill when visual aids may help less familiar responders and public officials grasp site response issues.

The DFG maintains and updates a response version of the SISRS database. OSPR biologists enter information into the databases as revisions are being developed. As often as the Area Committee approves updates and revisions to the site summaries and strategies, the effective date of approval is entered in the response version and revised ACP pages are produced. At intervals the USCG sends out updates. The amended ACP pages are distruted electronically and posted on the USCG web site in Adobe Acrobat files. The updated SISRS database response version will be available through a local DFG/OSPR biologist. In the future, the databases are slated to be available on the DFG/OSPR web site (<http://www.dfg.ca.gov/ospr>), and at California USCG offices and web sites. During spill response, even tentative site strategy revisions are available because the local OSPR biologist will bring the draft versions (recorded in the SISRS database) to the spill response.

Once site and response information is available in a digital format, it is more readily available to response planners. Currently, if oil spill response organizations or contingency plan holders or preparers need detail on amounts and types of equipment, they must page through the ACP and tabulate information manually. Similarly, regulators must comb the ACP to look for correspondence between facility and vessel contingency plans and response resources needed. The database will allow ready access of this information. This is another aid to preparedness, but some of the greatest opportunities of the SISRS database are in response.

## THE SISRS DATABASE AS A RESPONSE TOOL

The database can be used to expedite the spill response in several ways. The ACP pages, strategy diagrams and site photos can be printed or viewed to provide most current information, but more importantly, the user can produce a variety of response documents to guide response for the projected spill path. The most valued product is the strategy priority list, the "Site Index/Response a prioritized list of urgent spill response deployments.

This is the sequence of actions which would enable the database during a spill response. The OSPR biologist (strategist) on-scene develops a tentative trajectory for the spill. Since the user interface is graphical and shows sensitive site locations, he can click on the sites likely to be impacted by the trajectory. The ACP strategy options are then available in a list format for all the sites selected. The strategist then selects the suite of strategies which will best protect threatened sensitive sites. The strategist must consider the constraints of time and available response resources as well as the winds, tides, currents, and ecological variables present at that moment. Priorities are then assigned and projected times of impact can be entered as target times to complete the respective deployments. The output table lists the sites needing protection by their priority (in addition to spill containment and on-water skimming). The table may updated as conditions change or overflight information provides an improved trajectory.

This prioritized listing of response actions (Site Index/Response Actions form) becomes the guiding directive for the early hours of the spill until the first incident action plan can be prepared. It may be used by the operations chief to aid in action prioritization and response resource allocation and adjustment. It can also be used to provide a historical record of resource deployments, a record that facilitates the ICS Resources Unit and Financial Branch start-up.

The Site Index/Response Actions listing can in turn be used to produce ICS 204 Forms (work orders), which would normally be included in an Incident Action Plan. The program can produce modified ICS 204 forms with data from the database regarding tasking, safety, access, and equipment needed. The user can fill in additional specific detail. If an action is needed for which no ACP strategy has been prepared, a blank ICS-204 form can be immediately written and included. Though operations in the early hours of the spill generally proceed without written orders, this capacity allows such forms to be used early in the spill

to either clarify operations directives or to record operational assignments and progress for spill management and documentation. There is also a modified ICS 215 Form (Operational Planning Worksheet), which can be used to identify resources needed versus resources available, in an interactive format.

Another tool of the SISRS database is the Key Contact feature. Contacts having key information for sensitive sites or response at those locales are recorded in the database in a separate table. This key contact capacity provides a convenient way to keep and update contact information for spills, and then a quick look up resource during spills. The key-contact table can be searched for specific individuals, agency representatives, or expertise types. It is also used to keep and provide non-public numbers and sensitive information for spill responders. Some Area Committees are pursuing this table as the best location to store all spill response related phone numbers.

An advantage of the SISRS database in spill response is that the information can be downloaded or linked to other applications. As previously mentioned, there are several third party programs that use the data for spill response management. Another important link is to GIS systems. SISRS data can be down loaded and used with GIS. It is frequently the case that elected officials and government administrators remote from the spill are very interested in the details. The OSPR GIS system is used to track spill response, and the GIS in combination with the SISRS database can provide politicians an informed view of the spill, natural resource risks, and sensitive site protection measures, which can reduce pressure on the ICS.

## CONCLUSION

The SISRS approach and database are continuing to bring consistency to California's oil spill preparedness and response - consistency in site review and strategy development, consistency in ACP format and strategy information, and consistency in spill response documentation. This method and the database have wide acceptance and appreciation among the varied interests involved in California spill prevention and response. The database facilitates availability of information to spill responders as well as contingency planners, and provides a connection to other software tools such as third party spill management programs and government GIS systems. The database offers significant advantages to spill responders and provides coordination tools for the early hours of spills. Some Area Committees are considering including all preplanned deployments. This database will play a major role in California ACP publication and spill response management and may be expanded to include all response strategies in the future.

Disclaimer: Views expressed here are not necessarily those of the Ca DFG or USCG.



# APPENDIX 1

## S I S R S -PART I: SITE SUMMARY

Today is mth:    day:    /199                      Submitted/Revised to ACP mth    / day    /199

**1. SITE NAME** \_\_\_\_\_ ACP# \_\_\_\_\_  
 COUNTY \_\_\_\_\_ Long \_\_\_\_\_ W Lat \_\_\_\_\_  
 USGS QUAD \_\_\_\_\_ OSPR MAP# \_\_\_\_\_  
 NOAA Chrt \_\_\_\_\_ AAA-MAP \_\_\_\_\_  
 SISRS TEAM \_\_\_\_\_

**2. DIRECTIONS and ACCESS:** to site (by land and/or by water, to nearest launch ramp and are access permits required (254 char)):  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**3. HAZARDS and RESTRICTIONS - Air, Water & Ground - things to beware of approaching and at site (254 char):**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**4. SITE DELINEATION:** ( boundaries, distances, areas, etc.(254 char))  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**5. GENERAL SITE DESCRIPTION:** (Biological and physical character of site: habitats/terrain, exposure, beach slope, oceanographic data, presence of natural oil, quantity & types of debris, sediment dynamics, currents (500 char))  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**6. ESI CHARACTERIZATION OF SITE:** Water frontage miles included in this site \_\_\_\_\_ Indicate percent of shoreline where each type is present - total of percents may exceed 100%

1 Exposed Rocky Cliffs _____	5 Mixed Sand and Gravel _____	8 Sheltered Rocky Shores _____
2 Wave-cut Rock Platforms _____	6 Gravel Beach _____	8A Man-Made Structure _____
3 Fine-/Medium-Grain Sand _____	6A Rip-Rap _____	9 Sheltered Tidal Flats _____
4 Coarse-grain Sand _____	7 Exposed Tidal Flat _____	10 Marsh / Riparian _____

**7. MOST FREQUENT RECREATIONAL USES ASSOCIATED WITH THIS SITE:** (indicate use and relative sense of intensity (130 char))  
 \_\_\_\_\_

**8. STRUCTURES:** (indicate number and owner as appropriate (60 char each))

Commercial business \_\_\_\_\_  
 Retail business \_\_\_\_\_  
 Marina/Harbor \_\_\_\_\_  
 Piers & Groins (with paths?) \_\_\_\_\_  
 Residences \_\_\_\_\_  
 Other \_\_\_\_\_

**7. LOCAL CONTACTS:** (indicate Entry permission or access, Biological information, Logistical, Cultural, Trustee or Other assistance):

TYPE	NAME / ADDRESS	AFFILIATION	PHONE # / FAX #
E/L/B/C/T/O	_____	_____	( ) -
address:	_____	_____	( ) -
E/L/B/C/T/O	_____	_____	( ) -
address:	_____	_____	( ) -
E/L/B/C/T/O	_____	_____	( ) -
address:	_____	_____	( ) -

(More contacts on file ?    yes / no)  
**10. MORE INFO:** RPI Inlet study- y / n ; Photos- y / n ; Vidio- y / n ; Sketchs- y / n ; Beach profiles- y / n ; Trench profiles- y / n ; Bibliography- y / n

**S I S R S -PART II: RESOURCES AT RISK**

SITE \_\_\_\_\_ ACP# \_\_\_\_\_ mm /dd /199

**11. HABITATS AT RISK:** (Biological habitats including time of year when most sensitive and vulnerable (char 254))

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**12. SPECIES/COMMUNITIES AT RISK** (Brief summaries including time of year when most sensitive/vulnerable (254 char each))

A. BIRDS

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B. AQUATIC MAMMALS & OTHER LAND FAUNA

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C. INTERTIDAL BIOTA

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D. SUBMERGED AND EMERGENT FLORA

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E. LAND FLORA

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F. SUBTIDAL/AQUATIC RESOURCES INCLUDING FISH

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**13. CULTURAL AND ARCHAEOLOGICAL SENSITIVITIES** (254 char)

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**14. SEASONAL AND SPECIAL CONCERNS** (Any additional concerns, not mentioned above, eg. water intakes, economic or seasonal issues, etc. (254 char))

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**SISRS - PART III: STRATEGY SUMMARY SHEET**

SITE NAME \_\_\_\_\_ ACP# \_\_\_\_\_

**15. OIL AT SHORELINES**

**Characterize Background Oil Incidence** \_\_\_\_\_

**Potential Oil Impacts:** ( vulnerability to oil penetration or burial, organism burrows, watertable level & fluctuation (254 char))  
\_\_\_\_\_  
\_\_\_\_\_

Beaches [may be] [are] [un-] [suitable] [variable] for oil collection because \_\_\_\_\_ Debris [should  
be pre-cleaned] [may be left as an absorbant barrier] [is lower priority due to tidal elevation or quantity]. Comment on quantity, type, distribution & equipment and manpower needed  
\_\_\_\_\_  
\_\_\_\_\_

**16.A STRATEGY OBJECTIVE:** \_\_\_\_\_

(describe purpose or objective or low water, low energy or other condition (120 char) and technique including equipment (254 char))

**PROTECTION TECHNIQUE A :** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Equipment** \_\_\_\_\_

Number of Workers/Skiffs Needed \_\_\_\_\_ Level of Boom Tending \_\_\_\_\_

**16.A STRATEGY OBJECTIVE:** \_\_\_\_\_

(describe purpose or objective or low water, low energy or other condition (120 char) and technique including equipment (254 char))

**PROTECTION TECHNIQUE B :** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Equipment** \_\_\_\_\_

Number of Workers/Skiffs Needed \_\_\_\_\_ Level of Boom Tending \_\_\_\_\_

**16.C STRATEGY OBJECTIVE:** \_\_\_\_\_

(describe purpose or objective or low water, low energy or other condition (120 char) and technique including equipment (254 char))

**PROTECTION TECHNIQUE C :** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Equipment** \_\_\_\_\_

Number of Workers/Skiffs Needed \_\_\_\_\_ Level of Boom Tending \_\_\_\_\_

**16.D POTENTIAL RESPONSE ACTIVITY IMPACTS TO AVOID** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**S I S R S - PART IV: LOGISTICS**

SITE NAME \_\_\_\_\_ ACP# \_\_\_\_\_ Date mm /dd /199

17. LAND ACCESS LEVEL: (2WD, large truck, 4WD, Heavy equipment, foot, road limitations, private road, locked(40 char))

**18. WATER LOGISTICS:**

Access limitations: (depth, obstructions, etc (40 char)) \_\_\_\_\_

Boat Launching, Loading, docking facilities available (126 char)

19. FACILITIES, STAGING AREAS, POSSIBLE FIELD POSTS AND EQUIPMENT AVAILABLE (254 char)

20. COMMUNICATION LIMITATIONS: Radio Y / N Pager Y / N Cell phone Y / N

Response strategy diagram Y / N

LOGISTICS DIAGRAM - Aerial