NOTE:

The Kenya national framework for hydrocarbon release prevention, preparedness and response capacity uses the term “hydrocarbon” to refer to crude oil, natural gas, and any product derived from the fractional distillation and refining of crude oil (both liquid and gas phase) and the term “oil” to refer to liquid hydrocarbons. This National SCAT Guidance Manual is design to be used as part of the national framework, including the Kenya National Contingency Plan (NCP) for marine and navigable waters (Marine NCP) and the NCP for onshore areas (Onshore NCP). This guidance manual will assist responders tasked with the assessment, delineation, and documentation of oiled shorelines (marine and lake), river and stream banks, and land areas. The procedures in the guide provide an internationally accepted practice for tracking clean-up progress and completion. Users may include national to local government personnel as well as representatives from industry.

This manual is intended to be used in conjunction with the Marine-NCP or Onshore-NCP and with other spill contingency plans relevant to a specific spill location.

The manual is divided into four sections:

- Part One describes the role of SCAT in a spill response organization and how SCAT supports the response.
- Part Two describes the SCAT process and provides the spill Incident Management Team (IMT) with key information and material to understand how SCAT is integrated into the response effort.
- Part Three provides IMT members and SCAT personnel with the information needed to implement SCAT activities during a spill emergency response.
- Part Four provides national guidelines on how to describe and document shoreline oiling conditions during the response.

A Tools Section is provided as an attachment with checklists, forms, and reference guides to be used during a response.

Key information from sources that reflect the latest developments in using SCAT worldwide are included in this manual:

- SCAT Annex of the NW Area Plan, USA (issued by the SCAT Technical Workgroup in 2014)
- Tools and experience from years of SCAT implementation through
  - POLARIS Applied Sciences, Inc.
  - Owens Coastal Consultants
  - EML Mapping Ltd.
KENYA NATIONAL SHORELINE CLEAN-UP ASSESSMENT TECHNIQUE (SCAT) GUIDANCE MANUAL

Produced for KEPTAP, as part of the national framework for onshore and offshore hydrocarbon escape prevention, preparedness and response capacity, under Contract by Polaris Applied Sciences, Inc.

January 2020
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# Abbreviations and Acronyms

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<thead>
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<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CESG</td>
<td>Cleanup Endpoints Stakeholder Group</td>
</tr>
<tr>
<td>EFH</td>
<td>Essential Fish Habitat</td>
</tr>
<tr>
<td>EU</td>
<td>Environmental Unit</td>
</tr>
<tr>
<td>EUL</td>
<td>Environmental Unit Leader</td>
</tr>
<tr>
<td>FTP</td>
<td>file transfer protocol</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>IAP</td>
<td>Incident Action Plan</td>
</tr>
<tr>
<td>ICS</td>
<td>Incident Command System</td>
</tr>
<tr>
<td>ICP</td>
<td>Incident Command Post</td>
</tr>
<tr>
<td>IMT</td>
<td>Incident Management Team</td>
</tr>
<tr>
<td>JSA</td>
<td>Job Safety Analysis</td>
</tr>
<tr>
<td>KMA</td>
<td>Kenya Maritime Authority</td>
</tr>
<tr>
<td>NCP</td>
<td>National Contingency Plan</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environmental Management Authority</td>
</tr>
<tr>
<td>NEB</td>
<td>net environmental benefit</td>
</tr>
<tr>
<td>NFT</td>
<td>no further treatment</td>
</tr>
<tr>
<td>NOO</td>
<td>no oil observed</td>
</tr>
<tr>
<td>OP</td>
<td>operational period</td>
</tr>
<tr>
<td>OPS</td>
<td>Operation Section</td>
</tr>
<tr>
<td>PDA</td>
<td>personal digital assistant</td>
</tr>
<tr>
<td>PIST</td>
<td>Pre-Inspection Survey Transmittal</td>
</tr>
<tr>
<td>PPE</td>
<td>personal protective equipment</td>
</tr>
<tr>
<td>PSC</td>
<td>Planning Section Chief</td>
</tr>
<tr>
<td>QA/QC</td>
<td>quality assurance/quality control</td>
</tr>
<tr>
<td>RP</td>
<td>responsible party</td>
</tr>
<tr>
<td>RPIC</td>
<td>Responsible Party Incident Commander</td>
</tr>
<tr>
<td>RRT</td>
<td>Regional Response Team</td>
</tr>
<tr>
<td>SCAT</td>
<td>shoreline cleanup assessment technique</td>
</tr>
<tr>
<td>SIR</td>
<td>shoreline (or segment or STR) inspection report</td>
</tr>
<tr>
<td>SOS</td>
<td>shoreline oiling summary</td>
</tr>
<tr>
<td>SRP</td>
<td>shoreline response program</td>
</tr>
<tr>
<td>STAG</td>
<td>Shoreline Treatment Advisory Group</td>
</tr>
<tr>
<td>STR</td>
<td>shoreline treatment recommendation</td>
</tr>
<tr>
<td>SU</td>
<td>Situation Unit</td>
</tr>
<tr>
<td>UC</td>
<td>Unified Command</td>
</tr>
</tbody>
</table>
Initial Steps for SCAT Rollout

On Call-out

☐ Obtain spill specific information: spill location, product(s) spilled, geographic extent of affected area, safety concerns, contact call-back numbers, and location of Command Post.

☐ Mobilize SCAT Coordinator, Field Lead, and Database/GIS team members.

☐ Deploy to site with appropriate PPE and SCAT gear (see checklist pg. 35).

☐ Access RP oil spill response plan and determine spill segmentation, if needed.

On arrival at Command Post

☐ Check-in with Environmental Unit (or Planning Section if no EU) and liaise with lead agencies for planned SCAT activities.

☐ Obtain Spill-specific Safety Plan and briefing for field activities.

☐ Conduct initial aerial assessment to define extent downstream for surveys and operations.

Post-Initial Assessment

☐ Establish base mapping to include geographic segmentation aligned with operational divisions (coordinate with Situation Unit if in place).

☐ Establish work space and coordinate resource requirements with Logistics.

☐ Provide map showing extent, degree, and character of oiling (or other spilled material) on river banks or shorelines and priority protection, containment, and cleanup locations.

☐ Draft initial general Shoreline Treatment Recommendation (STR), with constraints as appropriate, in coordination with the EUL. Route to Planning Section Chief for approvals and issuance to Operations.

☐ Draft incident-specific SCAT Plan to define SCAT teams, organization, field deployment plan, shoreline types, treatment techniques, and phases of clean-up:
  ▪ Phase 1: bulk oil or product removal with cleanup targets by habitat or shore type;
  ▪ Phase 2: polishing phase with treatment completion criteria by habitat or shore type;
  ▪ Phase 3: monitoring natural attenuation.

☐ Maintain SCAT Group log (ICS 214)
# Revision Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Comments</th>
</tr>
</thead>
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<tr>
<td>August 2019</td>
<td>0</td>
<td>Guide development through the Technical Committee with Polaris Applied Sciences, Inc.</td>
</tr>
<tr>
<td>December 2019</td>
<td>0.1</td>
<td>Comments and edits suggested by the Technical Committee addressed by Polaris Applied Sciences, Inc.</td>
</tr>
<tr>
<td><strong>January 2020</strong></td>
<td>0.2</td>
<td>Final version to be presented to stakeholders and implemented in 2020</td>
</tr>
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</table>
Part 1: Organization and Management

During a spill response, the shoreline cleanup assessment technique (SCAT) is conducted as part of the Shoreline Response Program (SRP) coordinated under the Incident Command System (ICS). SCAT resides within the Environmental Unit (EU), under the Planning Section (Figure 1). A key role of the SCAT team is to support the response operations by communicating directly with the Operations personnel; this ensures that both teams understand each other’s roles and requirements and enables each team to provide input to the others decisions.

SCAT Team Roles and Responsibilities

Figures 1 and 2 show organizational charts for small and large spills, respectively. An example of SCAT organization (command and field) is outlined in Table 1. Roles and responsibilities for each position are described in the following section. Checklists for each role are provided in SECTION 5: TOOLS.

Figure 1  Small spill organizational chart (from NWACP 2014)
Figure 2  Large spill organizational chart (from NWACP 2014)

Table 1  Example of SCAT organization

<table>
<thead>
<tr>
<th>SCAT Command Organization</th>
<th>SCAT Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command Post</td>
<td>SCAT Data Manager / Data Entry</td>
</tr>
<tr>
<td></td>
<td>Archeologist/Cultural Specialist</td>
</tr>
</tbody>
</table>

| Field Team Organization                     |                                       |
|---------------------------------------------|                                       |
| Initial Aerial Reconnaissance (overflight)  | KMA                                    |
| and Aerial Surveys                          | RP                                     |
|                                             | KMA                                    |
|                                             | NEMA                                   |
|                                             | RP                                     |
|                                             | County Gov’t reps                      |
| SCAT Team 1                                 | KMA                                    |
|                                             | NEMA                                   |
|                                             | RP                                     |
|                                             | County Gov’t reps                      |
| SCAT Team 2                                 | KMA                                    |
|                                             | NEMA                                   |
|                                             | RP                                     |
|                                             | County Gov’t reps                      |
| SCAT Team 3                                 | KMA                                    |
|                                             | NEMA                                   |
|                                             | RP                                     |
|                                             | County Gov’t reps                      |
SCAT Coordinator

The SCAT Coordinator is in charge of the SCAT operations. The SCAT Coordinator reports directly to the Environment Unit Leader, but must maintain a close working relationship with the Operations Section, resource agencies, and other affected parties. In the field, SCAT teams may receive priorities and technical directions from the SCAT Coordinator via the SCAT Field Team Manager.

SCAT Field Teams

SCAT Field Team members will be assigned for each team (plus vessel/aircraft operators as needed), ideally with the following representation (one or more roles may be combined, or not be applicable):

- OSR Lead Agency (e.g., KMA for marine and navigable waters)
- NEMA
- RP
- County Government

Specific area information and site considerations are available from personnel at the EOC, including:

- OSR Lead Agency
- County government and/or oversight organization
- Government representative for ecological constraints
- Archeologist or cultural resource specialists who can advise on precautions and constraints to protect cultural resources, if needed

SCAT Data Manager

The SCAT Data Manager is responsible for receiving, reviewing, and storing all SCAT field data, and for the production of maps and tables as needed. The SCAT Data Manager may request the assignment of a SCAT Documentation specialist if the workload demands it.

SCAT Schedule

Efforts should be made to minimize personnel substitutions and select team members who can stay with the SCAT operations, or to have a systematic schedule of alternates; people who see conditions change through time have a better frame of reference for assessing the success of cleanup operations.

Team Priority

Areas where significant recoverable oiling has been noted or are of specific ecological importance will be prioritized to maximize recovery opportunities and to reduce overall impacts. The schedule for SCAT Field Teams will be defined daily and be reflected in the ICS 204 forms included in the response Incident Action Plan (IAP).
Integrating SCAT with ICS Planning

Information generated by SCAT is critical to spill response and is used throughout the planning and operational process (Figure 3). The SCAT team generates ICS forms to support the emergency management process. Table 2 summarizes the ICS forms generated by the SCAT team during the planning and operational process.

The IMT generates, approves and facilitates the implementation of an Incident Action Plan (IAP) daily, at the end of each cycle shown in Figure 3. The SCAT Coordinator synthesizes the field data into reports used by the EU and Planning Section to support the daily IAP. A Shoreline Treatment Recommendation (STR) form is generated by the SCAT team for each section of shoreline that has oil conditions which exceed the treatment criteria (Table 2). The information and recommendations in the STRs are reviewed by the Planning Section and the STRs are implemented by the Operations Section. SCAT supports the response objectives and mandates of the response operations, as directed and managed by the Unified Command (UC).
### Table 2  ICS forms generated by the SCAT team

<table>
<thead>
<tr>
<th>ICS Forms</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICS-234</td>
<td>Proposed STRs are reviewed by the Operations Section Chief (OSC) who considers and documents the various strategies and options that are available and then selects the most appropriate one(s). The STRs generated by the SCAT team and the daily SCAT field missions are summarized in the Work Analysis Matrix or ICS-234 form.</td>
</tr>
<tr>
<td>ICS-215</td>
<td>The Operational Planning Worksheet or ICS-215 is used by the Operations Section Chief in preparing for the next Operational Period. The ICS-215 is used to outline shoreline response work assignments (STRs) and resource requirements for the next Operational Period. Separately, all SCAT field activities and resources (including personnel and equipment) are included in an ICS-215 form.</td>
</tr>
<tr>
<td>ICS-204</td>
<td>Once strategies and required resources are presented at the Tactics Meeting and approved at the Planning Meeting, SCAT field activities and STRs become assignments for the next operational period. All assignments are included in the Incident Action Plan (IAP) using the Field Task Assignment or ICS-204 form.</td>
</tr>
<tr>
<td>ICS-232</td>
<td>The SCAT team must be aware of any resource at risk, identified in the Resources at Risk summary form or ICS-232 RR, and support keeping the form updated with any field observations regarding: environmentally-sensitive areas, wildlife, archeological, cultural and socio-economic issues.</td>
</tr>
</tbody>
</table>
Part 2: Shoreline Cleanup and Assessment Technique (SCAT)

The Shoreline Cleanup and Assessment Technique (SCAT) is an integral component of a spill response that provides real time information and recommendations for shoreline operations. SCAT surveys begin early in the response to assess initial shoreline conditions, and ideally continue throughout the response working in advance of shoreline cleanup to determine extent of shoreline impact, cleanup effectiveness, and eventually, to conduct final evaluations of shorelines to demonstrate treatment completion criteria is achieved.

Purpose
SCAT teams survey the affected area to provide geo-referenced documentation on impacted shoreline, river bank, or land conditions, as well as site specific sensitivities to oil and to treatment options, using standardized methods and terminology. The data and information generated by the SCAT surveys are compiled on a segment-by-segment basis, are crucial to the decision process, and are the foundation for planning the operational stages of the shoreline response, cleanup, and sign-off.

Decision Support
The SCAT Group typically is part of the Environmental Unit in the spill management organization (Figure 1) and provides technical and environmental advice as part of decision support for shoreline treatment planning and response operations from Day 1 to the last inspection irrespective of the size of a spill or the size of the area affected by the impact.

Operations Support
SCAT managers and team leads interact directly with Operations managers and field supervisors to explain the treatment recommendations and cleanup targets as defined on the Shoreline Treatment Recommendation (STR) forms (see Part 5, Forms) and to ensure that the field operations understand any environmental, cultural, safety, or other constraints that may be applicable to cleanup along specific segments.

County/Local Participation
The participation of Lead Agency (e.g., KMA or NEMA), and County government and/or Local representatives is a key element of the SCAT program as this joint team comprises representation of the Unified Command. County/local participation includes an appropriate level of involvement with the impacted shorelines and provides concurrence that sufficient treatment has been accomplished.

Project Closure
SCAT teams, in concert with RP, Lead Agency, and County government and/or Local representatives, inspect treated areas after cleanup has been completed to demonstrate treatment goals have been achieved. Cleanup goals, or targets, must be approved by Unified Command and typically are defined for the types of shorelines affected, product spilled, and resources at risk through a consultation process with RP, Lead Agency, County or Local, and environmental professionals. The SCAT group documents cleanup completion on a segment under an STR on STR Inspection Report (SIR) forms (Forms - Part 5).
SCAT Objectives
The objective of the SCAT survey is to collect and document real-time georeferenced data on the extent and degree of oiling (or other material) and shoreline conditions in a rapid, accurate, and systematic way. SCAT activities will vary depending on the stage of the response (Table 3). Figure 4 provides an overview of the SCAT process.

Table 3 SCAT activities and objectives during different stages of spill response

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INITIAL or REACTIVE RESPONSE PHASE (24-48 hrs)</td>
<td>This information is used to develop a general response plan and to recommend shoreline protection and cleanup priorities.</td>
</tr>
<tr>
<td>Aerial and/or ground reconnaissance surveys define the regional scale of the shoreline oiling (or other impacts) and define the overall character of the affected areas.</td>
<td></td>
</tr>
<tr>
<td>PLANNING or DECISION PHASE (48+ hrs)</td>
<td>These data are used to establish treatment priorities and treatment completion criteria and to recommend treatment options (strategies and tactics). Treatment actions are described using a Shoreline Treatment Recommendation (STR) form for each segment to be treated and is reviewed and approved by the spill management team.</td>
</tr>
<tr>
<td>Ground-based surveys document shoreline character and oiling conditions within segments that is entered into the SCAT data base.</td>
<td></td>
</tr>
<tr>
<td>OPERATIONAL or TREATMENT PHASE (48+ hrs)</td>
<td>SCAT teams discuss progress and issues associated with the treatment recommendations and treatment completion criteria.</td>
</tr>
<tr>
<td>Site visits to provide operational support to cleanup managers and supervisors. Can include pre-inspection surveys prior to formal post-treatment inspection surveys.</td>
<td></td>
</tr>
<tr>
<td>INSPECTION or CLOSURE PHASE (72+ hrs)</td>
<td>These post-treatment inspections provide closure so that operations teams can redeploy resources from a treated segment. The results of a segment survey are recorded on a Shoreline, Segment or STR Inspection Report (SIR) form.</td>
</tr>
<tr>
<td>Ground-based segment surveys document shoreline character and oiling conditions and determine whether the treatment completion criteria is achieved.</td>
<td></td>
</tr>
</tbody>
</table>
Figure 4  SCAT Process Flow Chart

- **Preparedness**
  - Pre-Spill Data Collection
  - Shoreline Segmentation
    - Segment Characterization
  - Resource and sensitivity information
  - Response tools and products

- **Spill**
  - Protect Shorelines
    - Recover Gross/Mobil Oil
  - Collect and Assess
    - Information and Data
  - Define regional distribution of oiled shorelines
  - Locate oil accumulations along shoreline

- ** Reactive Response Phase**
  - Collect and Assess
    - Information and Data
  - Assemble environmental information
    - Evaluate resources at risk
  - Shoreline segmentation
  - Segment characterization
  - Segment oiling conditions

- **Planned Response Phase**
  - Define Response Objectives
    - Define broad regional and segment-specific Objectives - Priorities - Endpoints - Constraints
  - Develop Response Procedures and Techniques
    - Define treatment strategies
    - Select treatment techniques/tactics
  - Evaluate Response Feasibility
    - Long-range regional plan
    - Individual segment or group-of-segments plans
    - Incident Action Plan
    - Segment Treatment Recommendations
  - Develop Shoreline Treatment Plans
  - Treat Shorelines
    - Segment Inspection Report
  - Post Treatment Inspection
  - SCAT Aerial and Ground Recon Surveys
  - SCAT Aerial Video Survey
  - SCAT Systematic Ground Surveys
  - SCAT Inspection Surveys

- **Completion and Monitoring Phase**
  - Treatment Completion
    - Post- Incident Assessment Evaluation of treatments Monitoring of effects
  - Closure
  - Monitoring

- **Preparedness**
  - Post- Incident Assessment Evaluation of treatments Monitoring of effects
Part 3: Implementing SCAT

SCAT activities and specific objectives vary during the evolution of a spill response (Figure 5). The basic sequence of steps in the SCAT process involves:

- an **aerial survey** (for all but small areas) and that may be done, in part, with drones to scale the problem and enable an appropriate number of SCAT teams to be deployed,
- a **ground survey** (SCAT Field Teams),
- **documentation of the oiling conditions** using Shoreline Oiling Summary (SOS) forms that are based on a set of standard oiling terms and definitions,
- an **assessment** of the overall oiling conditions and the development of a proposed shoreline treatment strategy that includes recommending **treatment**, and **operational priorities**,  
- the development of **Shoreline Treatment Recommendation (STR)** forms for review and approval by the spill management team,
- **discussions with operations personnel** to ensure that they understand the objectives of the treatment program and any environmental constraints to prevent additional damage that might result from field operations,
- **inspection** surveys with regional and/or local representatives to ensure that the treatment objectives have been met, and
- completion of a **STR Inspection Report (SIR)** form to recommend to the spill management team that no further treatment is necessary.
**RECONNAISSANCE PHASE**
(Ramping Up to Full SCAT Program)

1. Consider deploying early assessment/rapid response/ “hot shot” SCAT teams to gather initial shoreline impact information, if available.
2. Establish communication and coordination with OPS and Safety Officer.
3. Provide initial shoreline cleanup recommendations to OPS on day 1.
4. The Environmental Unit Leader will establish a SCAT Coordinator.
5. Establish objectives of the Shoreline Assessment Program using the objectives established by Unified Command as guidance.
6. Determine the scope and scale of the initial area to be surveyed by SCAT teams.
7. Determine the initial number of SCAT field teams and appropriate level of Command Post staff.
8. Map and segment the survey area.
9. Establish a data management system.
10. Select the appropriate SCAT forms to be used.
11. Develop a survey and reporting schedule as appropriate to provide key survey information as needed for incorporation into the Incident Action Plan.
12. Identify incident specific health and safety considerations for SCAT operations and communicate them to the Safety Officer.
13. Identify and request that Logistics assemble the essential equipment for the Field Teams.
14. Begin drafting a shoreline cleanup assessment work plan, including treatment and endpoint recommendations.
15. Identify and/or develop initial treatment and endpoint recommendations.

---

**SYSTEMATIC SURVEY**
(Full SCAT Program Implementation, Active Shoreline Treatment Ops)

1. Determine which areas should be surveyed and in what order always staying at least a day ahead of cleanup crews.
2. Ensure that all elements of the shoreline cleanup assessment work plan have been completed.
3. Prepare, deploy, and manage SCAT Field Teams conducting shoreline oiling surveys.
4. Establish process for summarizing SCAT field data and communicating data as appropriate.
5. Develop procedures for translating data into shoreline treatment recommendations (STRs) and having STR’s approved.
6. Consider establishing a “Shoreline Treatment Advisory Group” (STAG) and continue leading the effort to develop shoreline treatment guidelines.
7. Coordinate with Liaison to establish the “Cleanup Endpoint Stakeholder Group” (CESOG) and lead the effort to review shoreline treatment and cleanup endpoint recommendations.
8. Monitor locations and effectiveness of cleanups.
9. Develop periodic SCAT Reports. The frequency will be determined by the EUL.

---

**MONITORING/INSPECTION**
(After Cleanup Activities are Completed)

1. Establish a communication protocol with OPS that notifies the EUL and/or SCAT Coordinator when cleanup treatments have been completed on a given segment.
2. Evaluate the need for establishing a pre-sign-off inspection process prior to final sign-off inspections with the land owners/managers and develop as necessary.
3. Implement the formal sign-off inspection and approval process/procedures.
4. Deploy Sign-Off Teams to conduct post-cleanup inspections to confirm endpoint has been achieved.
5. Ensure that all of the completed inspection/recommendation documents are collected and archived appropriately.

---

Day 1 – “Day 2
Day 3+
Day 4 – Weeks/Months
Identify Resources at Risk
A range of information is recorded in addition to the location and character of the oil. This information includes the physical characteristics of the shoreline and any ecological, natural, cultural and human use resources that may be affected by oil or potential treatment activities. The inclusion of experts in these fields on the SCAT team, such as wildlife observers or archaeologists, can help accurately observe and document these resources.

Identify Factors that may Assist or Constrain Operations
As an element of operations support, the SCAT teams record factors that may assist or constrain operations to provide an accurate picture of a segment in which operations will carry out the proposed treatment activities. These factors include access points, staging areas, environmental and safety concerns, and any other key operational items to assist planners and operations.

Recommend Treatment Tactics
On the basis of the field observations, the SCAT team recommends appropriate treatment options for an oiled segment. An essential element of these recommendations is the development of treatment completion criteria by the spill management team (Section 4 – Cleanup and Treatment Completion Recommendations). The treatment completion criteria is based on the goals and objectives of the shoreline treatment program and should be established as soon as is practical so that the SCAT teams can provide recommendations appropriate to achieving those goals.

The spill management team also provides guidelines regarding which treatment tactics can be used to treat shorelines and what constraints may apply. RP Oil Spill Contingency Plans (OSCP) should include matrices of types of shorelines (or river banks) and examples of applicable cleanup techniques.

Inspect and Evaluate the Treatment Activities
An important role of the SCAT program is to ensure that the objectives and goals (treatment completion criteria) established by the spill management team are achieved. SCAT teams work in the field with Operations to ensure that these treatment completion criteria, as well as any tactical constraints that may apply, are understood.

SCAT Teams
SCAT teams collect the data needed to develop a shoreline cleanup plan that maximizes the recovery of oiled habitats and resources, while minimizing the risk of injury from cleanup efforts.

The team's responsibilities include:

- evaluating oil type and condition,
- factoring in shoreline types and local processes that affect oil behavior and cleanup methods,
- identifying environmentally and culturally sensitive resources,
- determining need for treatment,
- recommending treatment methods and completion criteria, and
- placing constraints on treatment if necessary, due to safety, ecological, economic, or cultural concerns.
Throughout the SCAT work, the team must give consideration to:

- potential for human exposure, by direct contact or through ingestion (drinking water or harvested resources),
- extent and duration of environmental impacts if the oil is not removed,
- natural removal rates,
- potential for remobilized oil to affect other sensitive resources, and
- likelihood that cleanup may cause greater harm than the oil alone.
Part 4: SCAT Field Observations

Standard Shoreline Oiling Summary (SOS) Form

The standard Shoreline Oiling Summary (SOS) form is the basic form from which adaptations may be developed. The most commonly used SCAT forms include standard SOS, Wetlands and Mangrove (for marine spills), and River and Stream (for inland spills). This section describes the information and data that are entered on a typical Marine Shoreline Oiling Summary form and the standard terms and definitions that have been developed.

Terms and examples of shoreline characteristics, features, and attributes are provided in Part 5 – River and Marine Shoreline Terms and Definitions.

SOS forms for streams and lakes are provided in Part 5 – Forms.
Figure 6: Example of Marine Shoreline Oiling Summary form
INSTRUCTIONS

Boxes 1 – 3 – GENERAL SURVEY INFORMATION

Complete boxes 1, 2 and 3.

Boxes 4 – 5 – SHORELINE TYPE AND OPERATIONAL FEATURES

The Shoreline Type (Box 4A) is that portion of the shoreline in which oil is stranded. The information on Coastal/Backshore Character and Operational Features (Box 4B, 5) is important for planning and operations in terms of access and staging; see Sediments and ESI Shoreline Types in the SCAT Reference Guides Section.

Box 4A: Select only one primary (P) shoreline type that best describes where the oil is located and any number of other secondary (S) types that apply to the segment.

Box 4B: Select as appropriate.

Box 5: Note any access or staging information that might be useful for the segment.

Box 6 – SURFACE OILING DESCRIPTION

If No Surface Oil Is Present:

➢ check the NO box in “Oil Character”

If Surface Oil Is Present:

STEP 1

Decide if the segment has relatively uniform alongshore and across-shore oiling conditions:

➢ if YES, then go to STEP 2:

➢ if NO, then (a) subdivide the segment into as many alongshore Sub-Segments and/or across-shore Zones as necessary for an accurate description, then (b) go to STEP 2. Use a separate form for each sub-segment.

STEP 2

Determine Width of Oil Band and Distribution of Oil According to the Following Criteria:

➢ Oil Width - Represents the average across-shore (perpendicular to the water line) dimension of the oiled area or band in the shoreline segment. If multiple bands or areas occur across shore, width represents the sum of their widths (these widths can be modified to reflect local conditions).

   Note: enter average width on the form (e.g., 1.5 m) or in tablet and avoid category break values (0.5 m, 3 m, and 6 m).

For data management purposes, oiled band width can be categorized into the following groups as shown in Table 4:

Table 4 Oiled band categories

<table>
<thead>
<tr>
<th>Width Group</th>
<th>Width of Oiled Band</th>
<th>Width of Oiled Band</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small Tidal Range (&lt;2m) and Lakes</td>
<td>Large Tidal Range (&gt;2m)</td>
</tr>
<tr>
<td>Wide</td>
<td>&gt; 2 m</td>
<td>&gt; 6 m</td>
</tr>
<tr>
<td>Medium</td>
<td>1 - 2 m</td>
<td>3 - 6 m</td>
</tr>
<tr>
<td>Narrow</td>
<td>0.3 – 1 m</td>
<td>0.5 – 3 m</td>
</tr>
<tr>
<td>Very Narrow</td>
<td>&lt; 0.3 m</td>
<td>&lt; 0.5 m</td>
</tr>
</tbody>
</table>
➢ **Oil Distribution (DIST)** - Represents the percent of the surface within a band or area covered by oil. In the event of multiple bands, distribution refers to the term that best represents the oil conditions for the segment (Figure 6).

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRACE (TR)</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td>SPORADIC (SP)</td>
<td>1 – 10%</td>
</tr>
<tr>
<td>PATCHY (PT)</td>
<td>11 – 50%</td>
</tr>
<tr>
<td>BROKEN (BR)</td>
<td>51 – 90%</td>
</tr>
<tr>
<td>CONTINUOUS (CN)</td>
<td>91 – 100%</td>
</tr>
</tbody>
</table>

*Note: enter exact percentage (e.g., 60%) and avoid category break values (1%, 10%, 50%, and 90%).*

The above two parameters are combined in the Initial Surface Oil Cover Matrix to determine the Initial Surface Oil Cover category (SCAT Data Manager).

### STEP 3
Determine Oil Thickness According to the Following Criteria:

➢ **Oil Thickness** - Refers to the average or dominant oil thickness within a band or area.

- **TO** (THICK or POOLED OIL) – generally consists of fresh oil or mousse accumulations > 1.0 cm thick.
- **CV** (COVER) – ≤ 1.0 cm and > 0.1 cm thick.
- **CT** (COAT) – ≤ 0.1 cm and > 0.01 cm thick coating, can be scratched off with fingernail on coarse sediments or bedrock.
- **ST** (STAIN) – ≤ 0.01 cm; cannot be scratched off easily on coarse sediments/bedrock.
- **FL** (FILM) – transparent or translucent film or sheen.

Further assessment of the oil is made by noting the character and elevation (location) of the oil within the shore or riverbank zone.

➢ **Oil Character/Debris Type**

- **FR** (FRESH) — unweathered, low viscosity oil.
- **MS** (MOUSSE) — emulsified oil (oil and water mixture) existing as patches or accumulations, or within interstitial spaces.
- **TB** (TAR BALLS or MOUSSE PATTIES) — discrete balls or patties on a beach or adhered to rock or coarse-sediment shoreline. Diameters are generally <0.1 m (balls) and 1.0 m to 0.1 m (patties).
- **TC** (TAR) — weathered Coat or Cover (Oil Thickness) of tarry, almost solid consistency.
- **SR** (SURFACE OIL RESIDUE) — Consists of non-cohesive, oiled, surface sediments, either as continuous patches or in coarse-sediment interstices.
- **AP** (ASPHALT PAVEMENT) — cohesive mixture of oil and sediments.
- **NO** (NO OIL) observed.
- **DB** (DEBRIS) — can consist of logs, vegetation, rubbish or general debris; includes spill response items (sorbents, boom, snares):
  - **LG** = logs
Intertidal Zones (note in Boxes 6 & 7 on the form for surface and subsurface oil)

**SU** Supratidal Zone — *the area above the mean high tide that occasionally experience wave activity. Also known as the splash zone.*

**UI** Upper Intertidal Zone — the upper approximate one third of the intertidal zone.

**MI** Mid Intertidal Zone — the middle approximate one third of the intertidal zone.

**LI** Lower Intertidal Zone — the lower approximate one third of the intertidal zone.

**STEP 4**

Draw sketch map(s) to locate sub-segments, zones, and oiled areas. Take photographs or videos.

**Box 7- SUBSURFACE OILING**

**STEP 5**

Decide if the segment has relatively uniform alongshore and across-shore subsurface oiling conditions:

- if YES, then go to STEP 2
- if NO, then (a) subdivide the segment into as many alongshore *sub-segments* and/or across-shore *zones* as are necessary for an accurate description, then (b) go to STEP 2. **Note:** as needed, use a separate form for each sub-segment.

**STEP 6**

Define the location (Surface Oil Zone), Trench/Pit Depth, Oiled Zone Depth, Oil Character, and Substrate Type(s) for each trench or pit

- **Sheen Color:**
  - **B** Brown
  - **R** Rainbow
  - **S** Silver
  - **N** No Oil observed

- **Subsurface Oil Character/Relative Oil Concentration:**
  Refers to a qualitative description of the degree of oil-filled pore spaces.

- **AP** ASPHALT PAVEMENT — cohesive mixture of weathered oil and sediment situated completely below a surface sediment layer(s) (thickness should be noted during observation).

- **OP** OIL-FILLED PORES — pore spaces in the sediment matrix are completely filled with oil. Often characterized by oil flowing out of the sediments when disturbed.

- **PP** PARTIALLY-FILLED PORES — pore spaces filled with oil, but generally does not flow out when exposed or disturbed.

- **OR/C** OIL RESIDUE – COVER (>0.1 – 1.0 cm) or COAT (0.01 – 0.1 cm) of oil residue on sediments and/or some pore spaces partially filled with oil. Can be scratched off easily with fingernail on coarse sediments or bedrock.
**OR/S**  
**OIL RESIDUE – STAIN** (< 0.01 cm) or film oil residue on the sediment surfaces. Non-cohesive. Cannot be scratched off easily on coarse sediments or bedrock.

**TR**  
**TRACE** — discontinuous film or spots of oil on sediments, or an odor or tackiness with no visible evidence of oil.

**NO**  
**NO OIL** — no visible or apparent evidence of oil.

**Box 8 - COMMENTS**
Add comments on cleanup recommendations, ecological, recreational, cultural, economic issues, and/or constraints and wildlife observations.

Locate pits or trenches on sketch maps. Take photographs or videos.
Figure 7 Visual aid to estimate surface oil distribution
Subsurface Oil Definitions

The following definitions have been developed to address potential problems associated with differentiating between what is considered surface and subsurface oil for oil character categories such as interstitial MS, surface SR, AP, subsurface OP and OR that begins at the surface, etc.:

Fine Sediments (Pebble, Gravel, Sand, Mud)

The subsurface begins at 5 cm in oiled sands. In a pit which has continuous oiled sands from the surface down to 20 cm, the upper 5 cm is classified as surface oil and the remainder as subsurface oil. The oiled interval is recorded as 0 to 20 cm. In the following example the oiled interval is 10 – 15 cm.

Coarse Sediments (Cobble, Boulder)

The subsurface begins where the top layer of cobbles or boulders contact the underlying layer of sediments.

Asphalt Pavement

Where AP exists on the surface, the subsurface begins at the bottom of the pavement, irrespective of pavement thickness.
Standard terms and definitions
The Substrate Type (Boxes 6 and 7) are defined as follows:

| R | Bedrock outcrops |
| B | Boulder (> 256 mm diameter) |
| C | Cobble (64 – 256 mm diameter) |
| P | Pebble (4 – 64 mm diameter) |
| G | Granule (2 – 4 mm diameter) |
| S | Sand (0.06 – 2 mm diameter) |
| M | Mud/Silt (< 0.06 mm diameter) |
| A | Anthropogenic/Manmade |

Survey Maps (Field Sketches, Annotated Satellite Imagery)
A survey map, either a field sketch or annotated aerial or satellite imagery, is created for each segment when it is surveyed. Survey maps identify the physical layout of the shoreline and the location of the oil, samples, pits, and photographs. (Note: Within a segment it is also valuable to locate areas of buried oil or product by flags or stakes so that operation crews can easily locate areas to be treated).

A field sketch (Figure 7), or annotated GoogleEarth or aerial imagery, is an illustration that highlights oiled (or affected) areas, characterizes surface and subsurface oiling, and provides operational and logistical information. Aerial photographs or small-scale maps can be traced to create a base map for the sketches in order to enhance their accuracy and scale. Printing imagery from programs such as Google Earth® and sketching on these images can work as an effective map as long as all pertinent information is still included. If only a portion of the segment is sketched or several sketch maps are drawn for a site, include a sketch location map to indicate how the sketches match or overlap.
Summary information can be drawn on digital photographs (Figure 8) which can be annotated with oiling zones, pits, access constraints and other information. Although these can be an extremely valuable visual tool for operations they should not replace the survey or sketch map.
Photographs
The widespread availability and use of digital cameras makes taking, organizing and storing photographs and video easy and a key component of any SCAT survey. Combining digital photographs and video with software that can match the photographs to a GPS track line allows the ability to stamp the geographic position of the photographer onto the photograph.

A critical procedure at the end of each field survey is to give the GPS and digital camera(s) used by the field team to the Data Manager for download. This allows all photographs to be georeferenced through the GPS/camera time codes. DO NOT “AVERAGE” the GPS track. **Use one official camera per SCAT team**

Figure 9  Examples of information summarized on digital photographs
and ensure it has good GPS fixes (and/or synchronize with a field GPS unit that is carried alongside the camera).

**Command Post Data Management and Results**

**Field Documentation and Information Transfer**
Field documentation on oiling conditions may be captured on electronic tablets set-up for SCAT data collection and/or field notebooks in conjunction with GPS tracks, waypoints, and photographs. Field observations may be entered direct into the SCAT database when using tablets or otherwise are provided to the data manager using standardized forms. Examples include the shoreline oiling summary (SOS) and shoreline treatment recommendation (STR) forms found in SECTION 5: Forms. These forms may need to be modified for spilled materials if other than oil.

**Aerial Surveys**
Completed field documents (notes, sketches, videos and photos) from aerial reconnaissance teams are to be provided by the team members and inspected by the Data Manager for QA/QC the same day to ensure that any necessary revisions are made prior to the surveys of the next day.

**Ground Surveys**
The SCAT Field Team Manager and each of the Field Teams are responsible for ensuring that the following tasks and field documentation are completed.

- Complete SOS Form
- Complete STR Form (if necessary)
- Sketch(es) or annotated imagery of the segment if oil is observed
- GPS coordinates of survey start and stop locations, oiled zones, and key site features
- Digital photographs and log including date, time, and location if oil is observed

The completed field documentation (SOSs, STRs, sketches and photos) from the ground survey teams are to be provided to the Field Team Manager (or Data Manager). This documentation must be reviewed at the command post for QA/QC on the same day as the survey to ensure that any necessary revisions are made prior to the surveys of the next day.

All GPS units and digital cameras will be surrendered to SCAT Data Manager immediately upon return to the Command Post for downloading. The Data Manager will ensure that device times are synchronized and that all waypoints, tracklogs, and digital pictures are erased from each device prior to being redeployed the next day with Field Teams.

In order to facilitate planning, the Team Members will notify the SCAT Field Team Manager on a daily basis if any segments are identified that will require Operations mobilization.
Data Management

QA/QC
The SCAT Data Manager receives and logs incoming SCAT field forms, sketches, and other information (photographs, video, etc.) and reviews the field information. The review involves a checking to make sure that all sections of the forms have been completed and that the information appears reasonable and consistent. Any questions regarding missing information or apparent inconsistencies are discussed with the field team members before the next field assignment. After the quality control is complete, forms are copied and distributed as needed and key information is transferred to tables or computer data files.

Data Outputs
The types of data, graphics, and tables that will be generated from the SCAT database may include:

- Maps of shoreline segments and soil/sediment types
- Oiling conditions
- Surface oil volumes, changes in volume through time
- SCAT field survey status
- Treatment recommendations
- Cleanup treatment status
- Lengths of oiled shoreline (by oil category and/or shoreline type)
- Lengths treated (by oil category and/or treatment method)
- Area surveyed

Record Keeping
Original SCAT field forms, sketches, and other information (photos, videotapes, etc.) and data, graphics, and tables generated during the incident will be provided by the SCAT Data Manager to the Documentation Section for retention. Only copies of these records will be distributed for use by stakeholders (i.e. RP, NEMA, and other relevant government agencies.).

Cleanup and Treatment Completion Recommendations
All spills have a point at which active cleanup and removal gives way to the natural degradation of the oil. In many cases, this termination point is developed through a process lead by the SCAT Coordinator (Cleanup Treatment Completion Criteria Stakeholder Group) and formalized by the Unified Command. In most cases, the treatment completion will be assumed to have been reached when worker safety would be compromised or the remaining oil presents less of a risk to the community or the resources than the treatment methods available.

After the Operations Division Supervisor or Shoreline Supervisor considers that cleanup in a segment has been completed, the segment will be inspected by a Sign-Off team which will (a) determine
whether the cleanup criteria have been met and (b) make a recommendation to the Unified Command regarding that segment. The team will use the treatment completion criteria (see examples outlined in Table 4) to make this determination. At the time of the inspection, the land manager or representative will accompany the team and a Segment Inspection Report (SIR) form will be completed. The Land Manager or representative may add notes in the “COMMENTS” text block on the SIR.

If the SCAT team (in consultation with the land manager) determines that no oil is present in the segment or that the cleanup has met the treatment completion criteria, then the members of the SCAT team representing the UC will sign the SIR and forward a No Further Action recommendation to the UC for approval. Note that a determination that treatment completion have been reached does not indicate that the segment is necessarily recovered or restored; which should be evaluated and determined by the Kenya Environmental Management Authority (NEMA).

If the SCAT team determines that a segment fails to meet the cleanup criteria the team will indicate this on the SIR. They will specify where work is still required in order for the segment to pass inspection and will forward the form to the Operations Section Chief via the SCAT Coordinator and the EUL.

The SCAT signoff process is intended to be a consensus-based team assessment. If, however, the team members are not in agreement regarding whether or not the endpoint criteria are met, then a sheet listing the reasons for disagreement is attached to the SIR and forwarded to the UC for resolution.
### Table 5  Example of guidelines for selecting cleanup methods and treatment completion criteria (modified from Whelan et al 2014)

<table>
<thead>
<tr>
<th>Basis for Treatment</th>
<th>Applicable Habitats</th>
<th>Treatment Methods</th>
<th>Example Primary Treatment Completion Criteria</th>
<th>Guidelines for NFT Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of Public Health and Safety</td>
<td>- High public use areas</td>
<td>- Whatever needed to remove threats: excavate, cut, flush, remove/replace</td>
<td>- No visible oil</td>
<td>- When oil residues are no longer a threat to human health and safety</td>
</tr>
<tr>
<td></td>
<td>- Residential areas</td>
<td></td>
<td>- No detectable oil (sight or smell)</td>
<td>- Falls below threshold odor or exposure limits</td>
</tr>
<tr>
<td></td>
<td>- Groundwater supplies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection of Sensitive Resources and Habitats</td>
<td>Wetlands, bird-nesting areas, T&amp;E species habitat, wildlife refuges, national parks, other protected areas</td>
<td>- Gross oil removal using vacuum, skimming, manual removal using walking boards in soft substrates - Passive recovery of sheens</td>
<td>- No free-floating black oil or mousse on the water surface - No accessible oiled debris - No oil in sediments that are used for nesting, hibernating grubbing for food</td>
<td>- Usually determined by resource manager or land manager experts - Case studies that show habitat damage from aggressive treatment - Particular sensitivity of a species or habitat - Inability to replace habitat</td>
</tr>
<tr>
<td>Removing Aesthetic Impacts in High-use Areas</td>
<td>- Hard substrates such as bedrock, gravel, seawalls, riprap - Beaches - Vegetation - Debris</td>
<td>- Wipe, high-pressure, high-temperature flush, cut, remove/replace</td>
<td>- No visible oil - No more than 20% Stain or Coat</td>
<td>- Less aggressive removal during seasonal low-use periods could allow natural processes to work - Consider how long before the oil weathers - Public information campaign concerning remaining staining required</td>
</tr>
<tr>
<td>Removing Contact Hazard (both humans and wildlife)</td>
<td>- Hard substrates such as seawalls, riprap, bedrock - Vegetation - Debris - Soil</td>
<td>- Wipe, flush, cut, sorbent barriers, remove/replace</td>
<td>- No longer rubs off on contact - No oil that rubs off on sorbents</td>
<td>- Consider how long before the oil will weather to a non-sticky Stain or Coat - Avoid excessive vegetation removal - Falls below known limits for hazards - Public information campaign concerning remaining staining required</td>
</tr>
</tbody>
</table>

*Version: January 2020*
<table>
<thead>
<tr>
<th>Basis for Treatment</th>
<th>Applicable Habitats</th>
<th>Treatment Methods</th>
<th>Example Primary Treatment Completion Criteria</th>
<th>Guidelines for NFT Determination</th>
</tr>
</thead>
</table>
| Mitigating Persistent Sheens | - Rivers, streams, other flowing water bodies  
- Lakes, ponds, other standing water bodies  
- Seasonally flooded wetlands | - Actively remove the major sources of sheens (excavate, dredge, flush, cut, remove/replace)  
- Passively contain/recover sheens with booms and sorbents | - No longer generates sheens that affect sensitive resources  
- No longer generates black oil or mousse during flushing operations  
- No longer generates black oil or mousse during high-water events | In low-use areas:  
- Consider seasonal use and processes (e.g., flooding) that speed natural removal  
In high-use areas:  
- Education on considerations between aggressive removal and chronic sheens  
- Site specific studies to assess receptor risk |
| Mitigating Intermittent Sheens (triggered by rainfall, temperature changes, etc.) | - Rivers, streams, other flowing water bodies  
- Lakes, ponds, other standing water bodies  
- Seasonally flooded wetlands | - Actively remove the major sources of sheens (excavate, dredge, flush, cut, remove/replace)  
- Passively contain/recover sheens with booms and sorbents | - No longer generates sheens that affect sensitive resources | In low-use areas:  
- Education on considerations between aggressive removal and chronic sheens  
In high-use areas:  
- Education on considerations between aggressive removal and chronic sheens  
- Site specific studies to assess receptor risk |
| Mitigating Sediment/Soil Contamination | - Upland soils  
- River/lake bed sediments  
- Wetland sediments | - Actively remove gross contamination (excavate, dredge, remove/replace)  
- Passively contain/ recover remobilized oil with booms and sorbents  
- In-situ techniques such as aeration, tilling, phytoremediation, adding nutrients | - No visual oil greater than Stain or Coat  
- Does not release black oil when disturbed  
- Agriculture or pasture for human use may need a ppm target to determine treatment completion | - High risk of erosion or excessive sedimentation  
- Unacceptable changes in surface topography  
- Avoid excessive change in sediment/soil quality, e.g., organic matter content, grain size  
- Potential permanent change to the habitat type e.g., wetland to open water |

1 Secondary treatment completion criteria should include “Or, as low as reasonably practicable considering net environmental benefit.”

2 No Further Treatment
Health and Safety

The Site Safety Plan prepared by the Site Safety Officer addresses the principal safety and health hazards from boat and water operations and shoreline assessment and cleanup operations. The site safety plan covers training, equipment safety, protective clothing and equipment, decontamination, and first aid and medical evacuation procedures to be used during the response. A generic Job Safety Analysis (JSA) is provided in Figure 9.

Specific safety considerations for SCAT operations include the following:

- Follow the Site Safety Plan
- Attend daily safety tailgate meetings regarding SCAT work
- Wear personal protective equipment
- Use personal flotation devices when transiting across water and review safe boating practices
- Watch for slips, trips, and falls
- Wear hearing protection when designated
- Watch for heat / cold stress
- Avoid interaction with wildlife
- Protect hands
- Operate equipment according to instructions
- Practice good housekeeping in work areas
### Example of a General JSA for SCAT Operations

**SCAT — GENERAL (w/BOAT TRANSIT) (w/out BOAT TRANSIT) Circle One**

**SITE SPECIFIC JSA**

<table>
<thead>
<tr>
<th>JOB SAFETY ANALYSIS</th>
<th>TEAM LEAD:</th>
<th>LOCATION:</th>
<th>DATE:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Instructions:**
1. First, complete sequence of job steps from start to finish (column 1 only). Limit basic steps to 10-15.
2. Then for each job step, list the hazards and control measures (columns 2 and 3).
3. Get proper reviews & signoffs (can be electronic).

**SPECIFIC JOB TASK/WORK ACTIVITY:**

**REQUIRED PERSONAL PROTECTIVE EQUIPMENT:**

<table>
<thead>
<tr>
<th>Eye Protection</th>
<th>Head Protection (Hat)</th>
<th>Hand Protection</th>
<th>Hot weather protection (Sunscreen/Skin protection/Insect repellant)</th>
<th>Foot Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rain Gear</th>
<th>Personal Flotation Device</th>
<th>Walking Stick</th>
<th>Cold weather protection (Gloves/Hat/Clothing layers)</th>
<th>OTHER PPE: Cross Contamination Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nitrile Gloves</td>
</tr>
</tbody>
</table>

**SEQUENCE OF BASIC JOB STEPS (Col. 1)**

1. **Transfers:**
   - Dock to boat.
   - Boat to dock.

   - Falling overboard; Slips, Trips and Falls; Pinch Points; Wind exposure; poor dock/pier condition. Abrupt boat handling; bumping dock or bank too hard on approach; excessive current and/or direction; insecure ladders/brows.

2. **Transfers (dry):**
   - Boat to shore.
   - Shore to boat.

   - Falling overboard; Slips, Trips and Falls; Pinch Points; excessive bow to ground height; insecure ladders/brows.

**POTENTIAL HAZARDS (Col. 2)**

*Examples: caught in machinery, cuts, back strain, slips/falls, struck by, elec. shock, fire, chemical exposure, etc.*

**CONTROL MEASURES (Col. 3)**

*Hierarchy: elimination, substitution, re-engineering, warning signs & systems, training/procedures, & PPE*

Falling overboard; Slips, Trips and Falls; Pinch Points; Wind exposure; poor dock/pier condition. Abrupt boat handling; bumping dock or bank too hard on approach; excessive current and/or direction; insecure ladders/brows. Approved PFD must be worn at all times, Follow direction of vessel Captain and crew at all times, Maintain three point hold on boat at all times (i.e., two hands, one foot), Keep hands and feet clear of pinch points, motors, and other moving equipment.

Falling overboard; Slips, Trips and Falls; Pinch Points; excessive bow to ground height; insecure ladders/brows. Approved PFD must be worn at all times, Follow direction of vessel Captain and crew at all times, Maintain three point hold on boat at all times (i.e., two hands, one foot), Keep hands and feet clear of pinch points, motors, and other moving equipment, hand personal equipment to crew; if needed ensure approved ladders/brows are properly secured.
<table>
<thead>
<tr>
<th>SEQUENCE OF BASIC JOB STEPS (Col. 1)</th>
<th>POTENTIAL HAZARDS (Col. 2)</th>
<th>CONTROL MEASURES (Col. 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>List task steps from start to finish (limit to 10 - 15 steps)</td>
<td>Examples: caught in machinery, cuts, back strain, slips/falls, struck by, elec. shock, fire, chemical exposure, etc.</td>
<td>Hierarchy: elimination, substitution, re-engineering, warning signs &amp; systems, training/procedures, &amp; PPE</td>
</tr>
<tr>
<td>3. Transfers (wading): Boat to shore. Shore to boat.</td>
<td>Falling overboard; Slips, Trips and Falls; Pinch Points; Rip tides and dangerous currents; Sun/Wind exposure; Cold water exposure; Dangerous marine life; dangerous wave height and/or direction; insecure ladders/brows.</td>
<td>Approved PFD must be worn at all times, Follow direction of vessel Captain and crew at all times, Maintain three point hold on boat at all times (i.e., two hands, one foot), Keep hands and feet clear of pinch points, motors, and other moving equipment, hand personal equipment to crew, help each other to board.</td>
</tr>
<tr>
<td>4. Transfers: Boat to boat.</td>
<td>Falling overboard; Slips, Trips and Falls; Pinch Points; Uneven elevations; Wind exposure; dangerous wave height and/or direction; insecure ladders/brows.</td>
<td>Approved PFD must be worn at all times, Follow direction of vessel Captain and crew at all times, Maintain three point hold on boat at all times (i.e., two hands, one foot), Keep hands and feet clear of pinch points, motors, and other moving equipment, hand personal equipment to crew, help each other to board.</td>
</tr>
<tr>
<td>5. Transits:</td>
<td>Falling overboard, Slips, Trips and Falls, Pinch Points, Mechanical – Motor, Weather - Sudden Storms, Fog. Grounding; striking submerged objects.</td>
<td>Approved PFD must be worn at all times, When working outside cabin, Wear proper foul-weather PPE if working outside of cabin, personnel remain seated on permanently affixed seat inside cabin while vessel is in-transit. Maintain three point hold on boat at all times (i.e., two hands, one foot), ensure all equipment is securely stowed. Keep hands and feet inside boat until docked and secured, Keep hands and feet away from motors or other moving equipment. Maintain radio communications. Keep alert for changes in weather. Seek shelter if adverse weather threatens.</td>
</tr>
<tr>
<td>6. Transportation to and from beach by automobile or foot</td>
<td>Heavy traffic and pedestrian congestion around roadways. Congested beaches.</td>
<td>Drive the speed limit. Pay attention - do not drive and talk on radio or cell phone. Watch for potentially dangerous situations.</td>
</tr>
<tr>
<td>SEQUENCE OF BASIC JOB STEPS (Col. 1)</td>
<td>POTENTIAL HAZARDS (Col. 2)</td>
<td>CONTROL MEASURES (Col. 3)</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
| **7. Loading and Unloading UTV from trailer** | Other vehicles in parking lot or loading area Equipment Failure (i.e. Trailer Hitch coming off ball) Back strain or pinch point when lifting /lowering ramps especially that don’t have spring assist. Inadvertent movement of trailer during loading or unloading UTV. | Use spotters as appropriate Hooking trailer to vehicle  
- Insure ball size is appropriate for hitch  
- Use spotter to back vehicle into position  
- Open coupler, place over ball (must completely cover ball), close coupler device  
- Insert locking safety pin  
- Verify safety chains crossed and provide sufficient slack for turns but not dragging  
- Conduct a Jack Test on the hitch – once trailer is hooked to vehicle crank jack leg down until up force is placed on hitch and ball and the hitch does not pop off the ball. Once verification is done, jack stand all the way up to ensure proper ground clearance while trailering.  
Use proper lifting technique and lift from the end of the ramp to get the most leverage; keep hands and fingers clear of hasp and lock pin slot. When necessary, two people are required to raise or lower ramps.  
Ensure UTV is properly secured on trailer using ratchet Straps at approved tie off points.  
Drivers should visually inspect trailer prior to UTVs driving on or off the trailer.  
Trailer/truck wheels properly chocked.  
Have proper PPE for Hooking up trailer and securing UTV. (i.e., abrasion gloves). |
<p>| <strong>8. Transportation to and from area by UTV</strong> | Congested site / survey area (workers/public). Other vehicle or heavy equipment traffic near site. Soft terrain. Wildlife. Accumulation of CO within enclosed UTV. | Do not exceed the speed limit. As appropriate, slow down for specific road conditions. Maintain safe distance between your vehicle and other vehicles while underway. Pay attention – do not drive and talk on radio or cell phone. Watch for potentially dangerous situations – verify depths of breaches before crossing. UTV’s must be operated in a manner so as to minimize disturbance to all wildlife and wetlands. Do not idle UTV while enclosure is in place. |</p>
<table>
<thead>
<tr>
<th>SEQUENCE OF BASIC JOB STEPS (Col. 1)</th>
<th>POTENTIAL HAZARDS (Col. 2)</th>
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<td>Hierarchy: elimination, substitution, re-engineering, warning signs &amp; systems, training/procedures, &amp; PPE</td>
</tr>
<tr>
<td><strong>9. Subsurface investigation of segment.</strong> [This step involves digging pits with shovel].</td>
<td>Back injuries. Foot injuries. Abrasions, blisters to hands (e.g., shoveling).</td>
<td>Always use proper digging technique - Use your legs. Wear proper footwear (boots with ankle support, puncture proof, etc). Wear proper PPE for the task (e.g., gloves).</td>
</tr>
<tr>
<td><strong>10. Subsurface Investigation Using Heavy Machinery w/Auger</strong></td>
<td>Head Injuries. Foot injuries. Caught in Machinery. Struck by equipment. Elevated noise levels.</td>
<td>Except for the operator and spotter, workers should not be near the auger when it is operating. Remain a safe distance of 10 meters in each direction (cones set up) from the auger when auger is running. Keep safe distance until operator shuts down auger and gives the all clear for investigation. When inspecting pits, do not get underneath boom arm. If team decides that auger needs to go deeper, then team vacates the 10 m perimeter and process starts over.</td>
</tr>
<tr>
<td><strong>11. Conduct general hazard assessment of area to be surveyed.</strong> [Discuss hazards with team before the start of bank/shore assessment].</td>
<td>Weather: Sudden Storms, fog; exposure to hot or cold weather conditions. Trash (broken glass, etc.), Sharps (hypodermic needles), Chemical Totes/Containers Slips, trips and falls – uneven surfaces – sink holes Quick sand type at water’s edge Fatigue. Injury while isolated. Potential dehydration (even in cold weather). Wildlife, Insects, Aquatic life that wash up on the beach. Muscle strains.</td>
<td>Keep alert for changes in the weather and adhere to Inclement Weather Plan. Wear proper clothing for conditions. Stay away from / do not handle Scan area for trip hazards and eliminate or avoid area. Use of proper body positioning. Wear proper boots for task. Watch footing, be aware of surroundings, min. two points of contact when removing boots. Take breaks as needed or as condition warrant. Work in pairs (two person teams). Rehydrate, at least 500ml water an hour during active field work. Avoid all wildlife. Use insect repellents. Try to use unscented soaps, laundry detergents, deodorants, perfumes, etc. Avoid disturbance to shore or river banks, watch where you step, wear the appropriate gloves.</td>
</tr>
</tbody>
</table>

Sign:
Recent Additions to the SCAT Process
Several developments in SCAT implementation have evolved over the past few years, some or all of which may be appropriate for specific spill conditions. The SCAT Coordinator should evaluate the need and benefit of using the following adaptations and implement where and as appropriate.

Drones
Unmanned Aerial Systems (UAS or “drones”) can be used to augment SCAT team visual observations. UAS must be flown by certified pilots and within airspace restrictions as defined for a spill area. For SCAT work, UAS are most effective when deployed to survey areas with difficult or unsafe access. Compiled imagery from programmed grid overflights can be used to develop high resolution aerial mosaics for Operations with detailed oil location information.

Canines
K9 SCAT was implemented in a formal manner during spill response in Canada in 2016-2017. Dogs trained specifically to locate and signal presence of oil are part of a K9 SCAT team, together with a SCAT Team Lead and the dog handler. The K9 SCAT team can be deployed to conduct Wide Area Search surveys to detect and/or clear areas with No Detectable Oil. K9 SCAT teams would not be appropriate in areas with obvious surface oil. K9 SCAT also can be used for oil delineation surveys particularly for buried oil, thereby reducing the need for extensive exploratory pits, trenches, or boreholes and allowing SCAT teams to focus on specific target locations. K9 SCAT teams can be used for to reconfirm target cleanup locations before Operations implement an STR and post-cleanup to clear areas as part of Shoreline Inspection Report (SIR) surveys. (see http://www.k9scat.com and API Technical Report 1149-4, 2016)

Sunken Oil SCAT
A methodology for systematic surveys, documentation, and management of oil conditions in cases where oil has sunk to the bottom of a river, lake, or the seabed has been developed in Canada through Environment and Climate Change Canada. The uSCAT Guide (Underwater Seabed Cleanup Assessment Technique for Sunken Oil) outlines a standardized procedure and process for the detection, assessment and documentation of sunken oil. The Guide assumes that uSCAT will be managed as a component of SCAT. As such, the uSCAT Guide is consistent with the SCAT process and procedures that would be applied in Kenya if needed. Snorkel SCAT, SCUBA SCAT, and other variations to detect, delineate, and characterize oil (or other heavy products) on bottom sediments should follow general SCAT principles when needed for a particular spill scenario.

SCAT-Ops Liaison
On large or complex cleanup incidents, the role of SCAT-Ops Liaison ensures that all levels of field operations fully understand the recommendations, objectives and constraints of the Shoreline Treatment Recommendations (STRs), so that any questions and concerns can be addressed directly. The SCAT-Ops Liaison reports to the SCAT Coordinator and typically deploys to the field with Operations cleanup supervisors to ensure a shared understanding of STRs, endpoints and operational constraints.
Checklists for SCAT Field Work
The following checklists should be reviewed by each field team.

Field Equipment Checklist
The following is a checklist of equipment that can be used by the field teams.

All team members
- Dress for the weather & walking on the shores
- High-visibility vest or coat required
- Personal flotation device (PFD)/exposure suit, floater suit/floater coat
- Other PPE per Safety Plan
- Rain gear, insect repellent, sun glasses, sun screen, hat, water
- Rubber boots, non-skid soles
- Gloves and liners - waterproof, work type, high quality

SCAT toolkits (1 per team)
- GPS (plus download cable and extra batteries)
- Digital camera (extra batteries) (NOTE: An appropriate digital field tablet may replace the need for a separate GPS and digital camera)
- Rangefinder
- Tape measure (for pits and scale)
- Shovel (field, collapsible or small)
- Waterproof paper for field forms and sketch maps, field notebooks (waterproof)
- Office supplies – pencils, waterproof markers, rulers, paperclips, clipboard
- Segment maps and base sketch maps (if available), topographical or nautical charts of area
- Compass
- Maps of area to be surveyed showing local names, segments, and other features (if available)
- First aid kit
- Water
- Day pack (waterproof)
- For remote areas: EPIRB (Emergency Position Indication Radio Beacon) and survival equipment (hunter’s survival kit or better)

Steps in On-Site Data Collection
- Reconnoitre the site to gain an overview perspective
- Define segment (sub-segment and zones) boundaries
- Describe shoreline type and character within the segment
- Describe surface oiling conditions
- Describe subsurface oiling conditions
- Draw sketch or map
- Take photos or video
Field Data Checklist

The following data are considered essential for a successful SCAT shoreline field survey:

☑ Shoreline Oiling Summary Form or other appropriate Standard Oiling Form (Attachment)
☑ General survey and shoreline characteristic information
☑ Surface and subsurface oiling
☑ Comments and treatment recommendations
☑ Survey Map, either a field sketch or annotated aerial or satellite imagery
  o Locations of surface and subsurface oiling (pits)
  o Access, staging, operational and safety concerns
  o Scale, north arrow, coordinates
  o Photographs
  o General shoreline/backshore characteristics
☑ General oil zone and detailed oil zone photos with scale
☑ Pit photos with scale
☑ Access points, identifying features and any other operational points of interest
SCAT Team Role Checklists

**SCAT Coordinator**
- Conducts reconnaissance to determine scope of shoreline oiling issues
- Integrates field observations and Shoreline Response Plan with existing RP and ACP, GRPs and/or pre-spill SCAT segments and related geodatabases (see Figure 9)
- Develops a survey and reporting schedule to produce survey results in time for incorporation into the Incident Action Plans
- Sets SCAT field objectives
- Serves as the primary point of contact for all SCAT activities
- Coordinates development of treatment recommendations and cleanup endpoints for Command approval, possibly with the assistance of a Shoreline Treatment Advisory Group (see below)
  - Leads the evaluation of treatment methods and cleanup endpoints and modifies them as necessary
- Works with Operations Section on implementation of cleanup method recommendations
- Attends tactics meetings as appropriate to help provide SCAT input into IAP development
- Briefs the IMT on issues raised by SCAT, particularly where cleanup methods must be modified to increase effectiveness or decrease impacts
- Coordinates with other members of the response effort with concerns on shoreline assessment to optimize data sharing, including team assessing overall damage on resources
- Integrates cleanup concerns of the various resource agencies and managers into the decision-making process, possibly through a Cleanup Endpoint Stakeholder Group

**SCAT Field Manager (may be combined with SCAT Coordinator)**
- Serves as the primary point of contact for all SCAT field-based activities
- Develops daily assignments for each team
- Assigns SCAT teams to meet SCAT field objectives
- Ensures that teams use proper terminology and apply guidelines uniformly
- Ensures that all teams have the necessary representation and all members have the necessary training, equipment and transportation.
- Helps the team reach consensus and reports dissenting opinions when consensus is not reached to SCAT Coordinator
- Conducts briefings with SCAT team members as needed
- Ensures adequate data is collected and communicated
- Communicates physical location of SCAT teams to OPS, SO & others
- Verifies that all SCAT field teams return at the end of the day
- Receives reports from field teams and synthesizes them into a daily summary for SCAT Coordinator

**SCAT Field Team Leader**
- Participate in shoreline assessment surveys to document shoreline character and oil types
- Act as team leader for an interagency field team
- Ensure that the team is briefed on and follows the safety plan (daily JSA)
KENYA SCAT Guidance Manual

☑ Decide on survey procedures and explain the objectives of the survey at each site
☑ Ensure that the team reaches consensus on the oiling observations
☑ Complete the Shoreline Oiling Summary form and take representative photographs of the site and the oiling conditions
☑ Take GPS way points of oiled locations
☑ Develop shoreline treatment recommendations and inspect shorelines after cleanup to ensure that they meet end point criteria
☑ Provide all forms, photographs and GPS tracks each day to the Data Manager upon completion of the survey

**SCAT Data Manager**

☑ Ensures dataflow meets OPS and Planning needs
☑ Provides SCAT data entry forms and field manuals to field teams
☑ Reviews daily SCAT forms for completeness and consistency
☑ Enters or supervises the entry of daily SCAT data
☑ Conducts data QA/QC; identify common data problems and train SCAT members how to prevent future problems
☑ Generates daily summary reports, maps, and data summaries
☑ Maintains an archive of all SCAT data, forms, photographs, GPS data, etc.

**Scheduler / Logistics Coordinator – Optional**

☑ Works with Data Manager, SCAT Coordinator, and SCAT Field Team Manager to determine where SCAT Field Teams should deploy.
☑ Submits requests for field supplies, equipment, personnel, and transportation through the Logistics Unit
☑ Develops and maintains a SCAT Calendar.
☑ Ensures property access agreements are obtained and adhered to

**SCAT GIS Analyst**

☑ Works with Data Manager, SCAT Coordinator, and SCAT Field Team Leaders to ensure data (GPS) downloads are complete and any maps produced can be reviewed.
☑ Assists team leads to load segment waypoints into GPS units as reference for field locations
☑ Provide maps for field teams (segments, previous survey results, transects, waypoints for special features)
☑ Maintain display of segment oiling summary maps, segment status and progress maps, and others as required
☑ May work in coordination with SIT Unit and Ops to provide updates on SCAT survey activities in conjunction with treatment
SCAT Reference Guides

Shoreline Sediments Types

<table>
<thead>
<tr>
<th>R</th>
<th>Bedrock outcrops</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Boulder (≥ 256 mm in diameter)</td>
</tr>
<tr>
<td>C</td>
<td>Cobble (64-256 mm)</td>
</tr>
<tr>
<td>P</td>
<td>Pebble (4-64 mm)</td>
</tr>
<tr>
<td>G</td>
<td>Granule (2-mm)</td>
</tr>
<tr>
<td>S</td>
<td>Sand (0.06-2 mm)</td>
</tr>
<tr>
<td>M</td>
<td>Mud (silt and clay, &lt;0.06 mm)</td>
</tr>
<tr>
<td>RR</td>
<td>Riprap (man-made permeable rubble)</td>
</tr>
</tbody>
</table>

Sediment Types (from NOAA, 2013)
<table>
<thead>
<tr>
<th>ESI No.</th>
<th>Estuarine</th>
<th>Lacustrine</th>
<th>Riverine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Exposed rocky shores</td>
<td>Exposed rocky shores</td>
<td>Exposed rocky banks</td>
</tr>
<tr>
<td>1B</td>
<td>Exposed, solid man-made structures</td>
<td>Exposed, solid man-made structures</td>
<td>Exposed, solid man-made structures</td>
</tr>
<tr>
<td>1C</td>
<td>Exposed rocky cliffs</td>
<td>Exposed rocky cliffs</td>
<td>Exposed rocky cliffs</td>
</tr>
<tr>
<td>2A</td>
<td>Exposed wave-cut platforms in bedrock, mud, or clay</td>
<td>Shelving bedrock shores</td>
<td>Rocky shoals; bedrock ledges</td>
</tr>
<tr>
<td>2B</td>
<td>Exposed scarps and steep slopes in clay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A</td>
<td>Fine- to medium-grained sand beaches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3B</td>
<td>Scarps and steep slopes in sand</td>
<td>Eroding scarps in unconsolidated sediments</td>
<td>Exposed, eroding banks in unconsolidated sediments</td>
</tr>
<tr>
<td>4</td>
<td>Coarse-grained sand beaches</td>
<td>Sand beaches</td>
<td>Sandy bars and gently sloping banks</td>
</tr>
<tr>
<td>5</td>
<td>Mixed sand and gravel beaches</td>
<td>Mixed sand and gravel beaches</td>
<td>Mixed sand and gravel bars and gently sloping banks</td>
</tr>
<tr>
<td>6A</td>
<td>Gravel beaches</td>
<td>Gravel Beaches (granules and pebbles)*</td>
<td>Gravel bars and gently sloping banks</td>
</tr>
<tr>
<td>6B</td>
<td>Riprap Gravel Beaches (cobbles and boulders)*</td>
<td>Riprap</td>
<td>Riprap</td>
</tr>
<tr>
<td>6C</td>
<td>Riprap, man-made erosion control structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Exposed tidal flats</td>
<td>Exposed tidal flats</td>
<td></td>
</tr>
<tr>
<td>8A</td>
<td>Sheltered scarps in bedrock, mud, or clay</td>
<td>Sheltered scarps in bedrock, mud, or clay</td>
<td></td>
</tr>
<tr>
<td>8B</td>
<td>Sheltered, solid man-made structures</td>
<td>Sheltered, solid man-made structures</td>
<td>Sheltered, solid man-made structures</td>
</tr>
<tr>
<td>8C</td>
<td>Sheltered riprap</td>
<td>Sheltered riprap</td>
<td>Sheltered riprap</td>
</tr>
<tr>
<td>8D</td>
<td>Sheltered rocky rubble shores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8E</td>
<td>Peat shorelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8F</td>
<td>Rias</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9A</td>
<td>Sheltered tidal flats</td>
<td>Sheltered sand/mud flats</td>
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</tr>
<tr>
<td>9B</td>
<td>Vegetated low banks</td>
<td>Vegetated low banks</td>
<td>Vegetated low banks</td>
</tr>
<tr>
<td>9C</td>
<td>Hypersaline tidal flats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10A</td>
<td>Salt- and brackish-water marshes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10B</td>
<td>Freshwater marshes</td>
<td>Freshwater marshes</td>
<td>Freshwater marshes</td>
</tr>
<tr>
<td>10C</td>
<td>Swamps</td>
<td>Swamps</td>
<td>Swamps</td>
</tr>
<tr>
<td>10D</td>
<td>Scrub-shrub wetlands; Mangroves</td>
<td>Scrub-shrub wetlands</td>
<td>Scrub-shrub wetlands</td>
</tr>
</tbody>
</table>
ESI No. | PALUSTRINE*
---|---
10B | Grassy
10C | Reeds
10D | Woody (shrubs/trees)

* Palustrine environment ESI codes are assigned based on the United States National Wetland Inventory (NWI) habitat classification system.

The classification scheme is based on an understanding of the physical and biological character of the shoreline environment, in addition to substrate type and grain size. Relationships among physical processes, substrate type, and associated biota produce specific geomorphic/ecologic shoreline types, sediment transport patterns, and predictable patterns in oil behavior and biological impact. The concepts relating natural factors to the relative sensitivity of coastline, mostly developed in the estuarine setting, were slightly modified for lakes and rivers. The sensitivity ranking is controlled by the following factors:

1. Relative exposure to wave, current, and tidal energy
2. Shoreline slope
3. Substrate type (grain size, mobility, penetration and/or burial, and trafficability)
4. Biological productivity and sensitivity
Example Descriptive Freshwater Habitats

- Sand Gravel Beach
- Emergent sandbar
- Deep Marsh Annual
- Deep Marsh Perennial
- Floodplain Forest
- Open Water
- Rooted Floating Aquatics
- Sedge Meadow
- Shallow Marsh Annual
- Shallow Marsh Perennial
- Submerged Aquatic Vegetation
- Wet Meadow
ESI Shoreline Examples

1. Exposed Rocky Shores

2. Exposed Rocky Platforms

3. Fine-grained Sand Beaches

4. Coarse-grained Sand Beaches

5. Mixed Sand and Gravel Beaches

6a. Gravel Beaches

6b. Riprap Structures

7. Exposed Tidal Flats

8a. Sheltered Rocky Shores

8b. Sheltered Artificial Structures

9. Sheltered Tidal Flats

10a. Salt to Brackish Marshes

10b. Freshwater Marshes

10c. Swamps

10d. Mangroves
### Treatment Options for Shorelines Habitats

(see additional matrices in NOAA API 1994, and NOAA 1993)

<table>
<thead>
<tr>
<th>Response Method</th>
<th>Bedrock</th>
<th>Man-Made</th>
<th>Sand</th>
<th>Vegetated Shores</th>
<th>Gravel</th>
<th>Gravel</th>
<th>Mud</th>
<th>Wetlands</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL RESPONSE METHODS</strong></td>
<td>1, 2, 8*</td>
<td>1.6</td>
<td>3.4</td>
<td>9</td>
<td>5</td>
<td>6</td>
<td>7.9</td>
<td>10</td>
</tr>
<tr>
<td>Natural Recovery</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Booming</td>
<td>-</td>
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</tr>
<tr>
<td>Skimming</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>Barriers/Berms</td>
<td>-</td>
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<tr>
<td>Physical Herding</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Manual Oil Removal/Cleaning</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Mechanical Oil Removal</td>
<td>-</td>
<td>-</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>D</td>
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<td>I</td>
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</tr>
</tbody>
</table>

*Key to ESI codes in Table 5 on page 12.

The following categories are used to compare the relative environmental impact of each response method for each oil type, using the following definitions:

A = May cause the least adverse habitat impact.

B = May cause some adverse habitat impact.

C = May cause significant adverse habitat impact.

D = May cause the most adverse habitat impact.

I = Insufficient information - impact or effectiveness of the method could not be evaluated at this time.

* = Not applicable for this oil type.
River Terms and Definitions
(From Owens 2013)

Valley Form (setting - general overall character)
- V-Shaped (River formed)
- U-Shaped
- Rift Valley
- Canyon/Ravine (Steep-sided)
- Gully (for smaller streams)
- Flood Plain

Channel Pattern (geomorphological classification of the river)

Single Channel
- Straight
- Sinuous
- Meander

Sinuosity is calculated as the length of the stream divided by the length of the valley. A perfectly straight river would have a meander ratio of 1 (it would be the same length as its valley), whereas the higher this ratio is above 1, the more the river meanders.
The sinuosity index has been used to separate single channel rivers into three general classes:
- straight (SI < 1.05),
- sinuous (SI = 1.05-1.5), and
- meandering (SI > 1.5).

**Multiple Channel (connected)**
- Slough
- Anastomosed (or anabranching)
- Braided
- Both are multi-threaded channels.
- The terms are not mutually exclusive – anastamosed channels can be braided

Source: http://w3.salemstate.edu/~lhanson/gls210/gls210_streams2.htm

**Channel Form (classification of channel water flow character)**
- Cascade (water falls) or step - involves a vertical water drop. Can result from bedrock outcrops (fall) or a line of interlocking boulders or cobbles across a channel (step).
- Rapids - fast, turbulent flow section of channel with intermittent white water
- Riffle - a section of shallow water without the turbulence that causes breaking waves (whitewater)
- Glide or Run - has swift water with little or no surface agitation or turbulence.
- Pool - has low flow or standing water.

(from http://www.njflyfishing.com/)
Classification of Kenya’s wetlands and their components

<table>
<thead>
<tr>
<th>Formation</th>
<th>System</th>
<th>Sub-system</th>
<th>Hydrology</th>
<th>Description</th>
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<tr>
<td>Coastal and Marine</td>
<td>Marine</td>
<td>Subtidal</td>
<td>Shallow marine waters</td>
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<td>Marine aquatic beds</td>
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<td>Coral reefs</td>
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<td>Estuarine</td>
<td>Subtidal</td>
<td>Estuarine waters</td>
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<td></td>
<td>Intertidal</td>
<td>Rocky marine shores</td>
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<td>Sand/shingle beaches</td>
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<tr>
<td></td>
<td>Lacustrine/palustrine</td>
<td>Permanent/seasonal</td>
<td>Brackish/saline lagoons</td>
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<td></td>
<td>Coastal fresh lagoons</td>
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<tr>
<td>Natural</td>
<td>Riverine</td>
<td>Perennial</td>
<td>Permanent rivers/streams</td>
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<td>Inland deltas</td>
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<td>Intermittent</td>
<td>Intermittent rivers/streams</td>
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<td>Floodplain wetlands</td>
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<td>Inland</td>
<td>Lacustrine</td>
<td>Permanent</td>
<td>Permanent freshwater lakes</td>
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<tr>
<td></td>
<td></td>
<td>Seasonal</td>
<td>Seasonal freshwater lakes</td>
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<td></td>
<td>Permanent/seasonal</td>
<td>Permanent/seasonal saline lakes and marshes</td>
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<tr>
<td></td>
<td>Palustrine</td>
<td>Permanent</td>
<td>Permanent freshwater ponds and marshes</td>
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<td>Open peat bogs, fens</td>
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<td>Shrub dominated swamps</td>
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<td>Freshwater swamp forests</td>
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<td>Peat swamp forests</td>
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<td>Seasonal</td>
<td>Freshwater springs, oases</td>
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<td>Seasonal freshwater marshes</td>
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<td>Human-made</td>
<td>Aquaculture</td>
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<td>Fish, shrimp ponds</td>
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<td>Farm ponds, small tanks</td>
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<td>Salt exploitation</td>
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<td>Seasonally flooded arable land</td>
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<td>Urban and industrial</td>
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<td>Reservoirs, barrages</td>
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<td>Sewage treatment plants</td>
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</table>

(from MEMR, 2012, Kenya Wetlands Atlas)
**Freshwater Environments Definition**

In freshwater environments, the shoreline zones are defined in relation to seasonal or annual water levels and swash zones.

Table 6  Freshwater Environments Definition

<table>
<thead>
<tr>
<th>TIME INUNDATED</th>
<th>MARINE</th>
<th>LAKE – POND</th>
<th>RIVER – STREAM</th>
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<tbody>
<tr>
<td>RARELY</td>
<td>BACKSHORE: terrestrial vegetation zone above the limit of marine processes</td>
<td>BACKSHORE*: terrestrial vegetation zone above the limit of lake processes</td>
<td>BACKSHORE*: terrestrial vegetation zone above the active floodplain</td>
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<tr>
<td>PERIODICALLY</td>
<td>SUPRATIDAL: above Mean High Water (MHW): salt tolerant species, inundated during spring tides and/or storms</td>
<td>SUPRASWASH: continuous terrestrial vegetation, inundated during seiche events and/or storms</td>
<td>SUPRACHANNEL: active flood plain between the bankfull level and the backshore, continuous terrestrial vegetation, inundated during high discharge events</td>
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<tr>
<td>REGULARLY</td>
<td>INTERTIDAL ZONE: between Mean Low Water (MLW) and MHW: alternately exposed and inundated during each tidal cycle</td>
<td>SWASH ZONE: inundated for extended periods of time</td>
<td>ACTIVE CHANNEL ZONE: between the bankfull level and channel margin** (waterline); alternately exposed and inundated as discharge varies</td>
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<tr>
<td>ALWAYS</td>
<td>SUBTIDAL: below MLW: almost always under underwater</td>
<td>LITTORAL: almost always underwater</td>
<td>CHANNEL: almost always underwater</td>
</tr>
</tbody>
</table>

* In aquatic environments, the “Backshore” is above the limit of water (marine, lake or river) processes and only is subject to rare or catastrophic hydrological events. For riverine environments, backshore is defined as the terraces and uplands above the ‘active floodplain’. Long-term operational staging should use the backshore zone. Short-term staging can utilize the floodplain-supra-swash zone bearing in mind that this zone may be inundated rapidly during a high-water level event.

** The channel margin is the land/water edge of the real time channel and can change with water flow variations.
References


Part 5: Forms

Pre-spill SCAT Survey Form

**Pre-Spill SCAT segment survey form (page 1)**

### 1 GENERAL INFORMATION
- **Location:**
- **Segment:**
- **Survey Date:**
- **Survey Time:**
- **Tide Level:**
- **Observer Name:**
- **Participants:**
- **Weather/Wind Conditions:**

### 2 PHYSICAL CHARACTER
- **Segment Length:**
- **Width (intertidal):**
- **Width (backshore):**

**POTENTIAL OIL BEHAVIOR:**
- natural alongshore movement barrier: yes / no
- man-made alongshore barrier: yes / no
- natural bay or embayment: yes / no
- tidal inlet or channel: yes / no
- tidal lagoon or estuary: yes / no
- sand shoreline/potential for burial: yes / no
- overwash into lagoon or marsh: yes / no
- pebble-cobble shoreline/penetration potential: yes / no
- mrap, boulder shoreline/penetration-renobilization potential: yes / no
- marsh-wetland/potential for oiling meadow area: yes / no
- other:

### 3 RESOURCE ISSUES:
- **Environmental**
- **Cultural**
- **Human Use/ Economic**

### 4 OPERATIONAL CHARACTERISTICS
- **Surrounding Human Use Activities (if any):** Natural / Agricultural / Commercial / Residential / Recreational
- **Potential nearby access:** fixed-wing helo padlanding boat landing ATV
- **Access constraints/limitations:**
- **Describe the amount of pre-impact debris pickup/relocation work?** (light / moderate / heavy) No. of bags? (estimate # of bags)
- remote: yes / no
- nearshore shoals/reefs: yes / no
- narrow intertidal zone: yes / no
- staging areas: yes / no
- exposed coast: yes / no
- shore zone suitable for machinery: yes / no
- road access: yes / no
- strong currents: yes / no
- backshore cliff: yes / no
- alongshore access: yes / no
- wetlands: yes / no
- high tidal range: yes / no

### 5 OPERATIONAL SAFETY CONSIDERATIONS
- **Note Safety Constraints Beyond Normal — or N/A:**

(form revision: August 2012)
### Pre-Spill SCAT segment survey form (page 2)

**GENERAL INFORMATION**

Survey Date:

**RESPONSE GOALS**

1. Prevent contact with shore or resource(s) at risk
2. Minimize contact
3. Prevent oil movement to adjacent segment(s)
4. Contain stranded oil
5. Prevent oil transport into inlet, estuary, or channel
6. Other:

**SEGMENT PROTECTION STRATEGIES**

1. Contain oil spill on water
2. Alter direction of movement of oil on water
3. Prevent oil movement (landward) on foaming tides
4. Tract/contain and collect oil at the shoreline
5. Prevent remobilization of stranded oil
6. Prevent overwash into the backshore or a lagoon
7. Pre-impact shoreline debris removal
8. Other:

**SHORELINE CLEANUP/TREATMENT OBJECTIVES**

1. Allow natural recovery
2. Restore shore to pre-oiling condition
3. Accelerate natural recovery
4. Restore with minimal removal of material
5. Minimize oil remobilization
6. Minimize damage to dune, marsh, or salt bag
7. Other:

**SHORELINE CLEANUP/TREATMENT STRATEGIES**

1. Monitor
2. Act quickly to remove stranded oil before burst
3. Remove bulk oil only
4. Minimize waste generation using in-situ treatment methods
5. Manual techniques preferred
6. Salt marsh fringe/rook treatment strategies
7. Man-made backshore (spat) treatment techniques
8. Other:

**METHODS**

(Check all that are appropriate and feasible)  
(mark “?” if possibly useful; mark “X” if not recommended or inappropriate)

**POTENTIAL PROTECTION OPTIONS**

1. Nearshore containment/recovery
2. Nearshore reduction (away)
3. Nearshore reduction (towards)
4. Excision boom
5. Shoreline (interidal) protection boom
6. Shoreline barrier/berm
7. Contact barrier
8. Channel boom/barrier

**POTENTIAL CLEANUP/TREATMENT OPTIONS**

1. Natural recovery
2. Flooding
3. Low-pressure, cold wash
4. Low-pressure, hot/warm wash
5. High-pressure, cold wash
6. High-pressure, hot/warm wash
7. Steam cleaning
8. Sandblasting
10. Vacuums
11. Mechanical removal
12. Vegetation removal
13. Passive sorbent
14. Tilling/Aeration
15. Saf washing/Sediment reworking
16. Burning
17. Dispersants
18. Shoreline cleaners
19. Goodiers
20. Bioremediation/Nutrient enrichment

**OPERATIONAL ISSUES**

Enter “No” or “Yes”

<table>
<thead>
<tr>
<th>Spill Site Access</th>
<th>Trucks</th>
<th>Heavy Equip.</th>
<th>2X4 PU</th>
<th>Backhoes</th>
<th>ATVs</th>
<th>Vessel</th>
<th>Runabouts</th>
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**HEAVY EQUIPMENT USE FEASIBILITY**

Enter “Good,” “Fair,” “Poor,” or “No” based on ability to operate

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<th>Grader</th>
<th>Bulldozer</th>
<th>Front-end Loader</th>
<th>Backhoe</th>
<th>Bobcat</th>
<th>4x4 PU</th>
<th>ATVs</th>
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<td>Access Alongshore</td>
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<td>Bearing Capacity</td>
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<td>Beach Slope/Width</td>
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</tbody>
</table>

Maximum Distance to Temporary Storage from Cleanup Site? (metres)

**COMMENTS**

**VISUALS**

SKETCH Attached: yes no
PHOTOS Attached: yes no
roll # frames to
VIDEO: yes no tape #: Minutes to Storage Location

Page 2 of 2
**Marine (tropical) SOS Form**

<table>
<thead>
<tr>
<th>MARINE TROPICAL (SOS) FORM (ver. Mod)</th>
<th>Incident:</th>
<th>Page of</th>
</tr>
</thead>
</table>

**1. GENERAL INFORMATION**
- **Date (dd/mm/yyyy):**
- **Time (24h standard/daylight):**
- **Tide Height (m):**
- **Low:**
- **High:**
- **Segment ID:**
- **Segment Name:**
- **Ops Zone:**
- **Survey Type:**
- **STR:**
- **Survey By:** (Foot, ATV, Boat, Helicopter, Other)
- **Weather:** (Sun, Clouds, Fog, Rain, Windy, Calm)

**2. SURVEY TEAM**
- **Name**
- **Organization**
- **Team Number**

**3. SEGMENT**
- **Total Length:**
- **Length Surveyed:**
- **Datum:**

**4a. SHORELINE TYPE:**
- **Indicate only ONE Primary (dominant) type and ALL Secondary types. CIRCLE those OILED.**
- **BEDROCK:** Cliff, Ramp, Platform
- **MAN-MADE:** Solid, Permeable
- **Sediment:** BEACH: Sand, Mixed, Pebble/Cobble, Boulder
- **Sediment FLAT:** Mud, Sand, Mixed, Pebble/Cobble/Boulder
- **Description:**
- **WETLAND:**

**4b. COASTAL/BACKSHORE CHARACTER**
- **Indicate only ONE Primary (P) and ANY Secondary (S) types.**
- **Cliff/Hill:**
- **Sloped:** (>5')
- **Man-Made:**
- **Bare:**
- **Cored Debris:** Yes / No
- **Type:**
- **Amount:** (bags/trucks)
- **Direct backshore access?** Yes / No
- **Suitable for backshore staging?** Yes / No
- **Access Description / Restrictions:**
- **Current Dominated Channel?** Yes / No

**5. OILING DESCRIPTION:**
- **Use letters A-Z, Indicate 100% overlapping oil zones in different tidal zones by numbering them (e.g. A1, A2).**

<table>
<thead>
<tr>
<th>Zone ID</th>
<th>WP # Start</th>
<th>WP # End</th>
<th>Tidal Zone</th>
<th>Area Distribution</th>
<th>Size</th>
<th>Oil Cover</th>
<th>Oil Thickness</th>
<th>Oil Character</th>
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<tbody>
<tr>
<td></td>
<td>Li M Ul Su</td>
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</tbody>
</table>

**6. SUBSURFACE OILING CONDITIONS:**
- **Format:** Indicate Zone ID in Pit #, e.g., A-1, B-2, C-3. (Use only number if not in zone e.g. 4.5)

<table>
<thead>
<tr>
<th>Pit #</th>
<th>WP #</th>
<th>Substrate Type</th>
<th>Tidal Zone</th>
<th>Oil Depth</th>
<th>Oiled Interval</th>
<th>Subsurface Oil Character</th>
<th>Water Table</th>
<th>Sheen Color</th>
<th>Clean Below</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Li M Ul Su</td>
<td>cm-cm</td>
<td>cm-cm</td>
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<td>Yes / No</td>
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<td>Li M Ul Su</td>
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<td>Li M Ul Su</td>
<td>cm-cm</td>
<td>cm-cm</td>
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<td></td>
<td></td>
<td>Yes / No</td>
</tr>
</tbody>
</table>

**7. COMMENTS:**
- Cleanup Recommendations, Ecological/Recreational/Cultural/Economic Issues; Wildlife Observations; Other Descriptions
- *Use supplemental river SOS form for additional oiling zones, pits, and comments/sketches.*
- **Sketch / Map:** Yes / No
- **Photos/Video:** Yes / No
- **Numbers:** (-)
- **Photographer Name:**

Version: January 2020
Mangroves Oiling Summary Form

MANGROVE OILING SUMMARY FORM for __________ spill  Page ___ of ___

1 GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Segment ID:</th>
<th>Date (dd/mm/yy)</th>
<th>Time (24H):</th>
<th>Tide Height (m/ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ops. Division:</td>
<td>Daylight: __hs to __hs</td>
<td>Rising/falling</td>
<td></td>
</tr>
</tbody>
</table>

Survey by: foot/ ATV/ Boat/ Helicopter/ Overlook/ Others

Sun/ Cloud/ Rain/ Windy/ Calm

2 SURVEY TEAM # __________

Team members: Name, Organisation, Contact Phone number

3 SEGMENT

<table>
<thead>
<tr>
<th>Start GPS</th>
<th>Total Length (m)</th>
<th>Length Surveyed (m)</th>
<th>Datum:</th>
</tr>
</thead>
<tbody>
<tr>
<td>End GPS</td>
<td>Lat: __o __min</td>
<td>Long: __o __min</td>
<td>Area (m²)</td>
</tr>
<tr>
<td>Lat: __o __min</td>
<td>Long: __o __min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4A SHORE FEATURE

- Delta
- Lagoon
- Estuary
- Delta
- Fringe
- Estuarine Lagoon
- Estuarine Delta

4B MANGROVE TYPE

- Overwash
- Riverine
- Hammock
- Fringing
- Basin
- Scrub

4C ROOT TYPES

- Stilt Roots
- Pneumatophores
- Buttress Roots

4D BACKSHORE CHARACTER

Select only ONE oiled primary (P) type and any secondary (S)

- Delta
- Tidal Inlet
- Wetland
- Barrier beach
- Dune
- Channel
- Others

5 OPERATIONAL FEATURES

Suitable backshore or alongshore staging Y / N

Direct backshore access Y / N

Surface bearing capacity suitable for:

to

Access restriction Y / N

If YES – add note in Comment Box #1 (Circle only those applicable)

6 SURFACE OILING CONDITIONS

Enter Oil on Substrate versus Oil on Vegetation on different lines, using (S) or (V) after the Zone ID. Indicate the position of each ZONE on the cross-section below.

7 SUBSURFACE OILING CONDITIONS

If ‘Y’, describe in Comment Section (box 8) and indicate location in cross-section

8 COMMENTS

Cleanup recommendation ecological / recreational / cultural / economic issues & constrains / wildlife

Approx Total Oiled Area __________ km²

Show:

- High tide level (HTL)
- Low tide level (LTL)
- Surface oil (SO)
- Subsurface oil (SSO)
- Key vegetation zones

Scale

Supratidal zone   Intertidal zone
# Inland Water SOS (Rivers / Streams / Lakes) Form

**RIVER BANK (SOS) FORM (ver. 15Feb13)**

<table>
<thead>
<tr>
<th>Incident:</th>
<th>Page of</th>
</tr>
</thead>
</table>

### 1. GENERAL INFORMATION

- **Date (dd/mm/yyyy):**
- **Time (24hr standard/daylight):**
- **Water Level:** Low / Mean / Bankfull / Overbank
- **Survey By:** Foot / ATV / Boat / Helicopter / Other
- **Weather:** Sun / Clouds / Fog / Rain / Snow / Windy / Calm

### 2. SURVEY TEAM

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
</table>

### 3. SEGMENT

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>Bank:</th>
<th>Segment Name</th>
<th>Op:</th>
<th>Survey Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>STR:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team Number</th>
<th>Total Length:</th>
<th>Survey Start GPS:</th>
<th>Survey End GPS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>meters</td>
<td>LAT:</td>
<td>LAT:</td>
</tr>
<tr>
<td></td>
<td>meters</td>
<td>LON:</td>
<td>LON:</td>
</tr>
</tbody>
</table>

### 4a. RIVER BANK TYPE

- **BEDROCK:** Cliff / Ramp / Shelf
- **MAN-MADE:** Solid / Permeable
- **UNCONSOLIDATED:** Clay / Mud / Sand / Mixed Fine / Shell
- **Description:** Marsh / Swamp / Peat / Organic / Wooded / Vegetated
- **ESI Code (primary):** (secondary)
- **Other:** Undercut Bank (Y / N) or

### 4b. OVERBANK / BACKSHORE TYPE

- **Cliff/Bluff:** Height: m
- **Flat/Lowland:** Field: Dune / Inlet/Channel / Delta / Lagoon / Marsh/Wetland
- **Sloped:** > (5°) 15° 30°
- **Man-Made:**
- **Other:** Wooded / Vegetated

### 4c. RIVER VALLEY CHARACTER

- **Channel Width:** < 10 m 10-100 m >100 m estimate m
- **Water Depth:** < 1 m 1-5 m >5 m estimate m
- **SHOAL substrate:** silt / sand / mixed / cobble / boulder / bedrock / debris
- **CHANNEL FORM:** Cascade / Rapids / Pool / Riffle / Glide / Jam / Other
- **RIVER FORM:** Straight / Meander / Anastomosed / Braided / Other
- **VALLEY FORM:** Canyon / Confined / Leved / Channel / Flood Plain / Valley / Other

### 5. OPERATIONAL FEATURES

- **Oiled Debris:** Yes / No
- **Type:**
- **Amount:** (bags / trucks)
- **Direct backshore access:** Yes / No
- **Alongshore access from next segment:** Yes / No
- **Suitable for backshore staging:** Yes / No

### 6. OILING DESCRIPTION

- **Zone ID:**
- **WP Start:**
- **WP End:**
- **River Bank Zone:**
- **Oil Cover:**
- **Oil Character:**

### 7. SUBSURFACE OILING CONDITIONS

- **Pit #**
- **Substrate Type:**
- **River Bank Zone:**
- **Pit Depth:** cm
- **Oil Depth (cm-cm):**
- **Subsurface Oil Character:**
- **Water Table:** cm
- **Sheen Color:**
- **Clean Below:**

### 8. COMMENTS

*Use supplemental river SOS form for additional oiling zones, pits, and comments / sketches.

**Sketch / Map:** Yes / No **Photos / Video:** Yes / No **Numbers:** ( ) **Photographer Name:**
Shoreline Treatment Recommendation (STR) Template

**INCIDENT NAME**
Shoreline Treatment Recommendation
Operational Permit to Work

<table>
<thead>
<tr>
<th>Segment:</th>
<th>Survey Date:</th>
</tr>
</thead>
</table>

| Start Latitude: | End Lat: |
| Start Longitude: | End Long: |
| Length (m): |

Shoreline Type: Primary Secondary

**Oiled Areas for Treatment:**
Auto entry directly populated from data base of:
Zone, Shoreline Type, L x W, Oil % Dist, Oil Character, Oil Thickness, Oiling Category
- e.g. Zone A: Salt marsh, 200 m x 1 m, 10% Fresh oil, pooled, Oiling Category: Heavy

**Cleanup Recommendations:**
(Use standard terms and definitions from a Word document or populate database with these standard statements)

**Staging and/or Logistics Constraints/Waste Issues:**

**Ecological Concerns:**

**Cultural / Historical Concerns:**

**Safety Concerns:**

Attachments: □ Segment Map □ Sketch □ SCAT Form □ Fact Sheet □ Other

Prepared by: __________________ Date Prepared: __________

Date Time
to SOSC to Land Mgr to SHPO to EU Leader to __________

**Final Approval**
State OSC Rep Federal OSC Rep EU Leader

**Submitted** to OPS __________

** When Treatment is completed, send a Segment Completion Report to SCAT **
Segment Inspection Report (SIR) Form

SEGMENT INSPECTION REPORT

INCIDENT NAME

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>Segment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic Name</td>
<td></td>
</tr>
<tr>
<td>Operations Division</td>
<td></td>
</tr>
</tbody>
</table>

Date of Survey: ___________________________
Time of Survey: ___________________________
Tide Stage: ___________________________
Weather: ___________________________

Inspection Completed Along Entire Segment?

YES  NO

SCAT Team ( ) Members
If no further treatment is required, each UC rep sign below:

Name                      Signature
__________________________  RP rep.    ____________________________
__________________________  Lead Agency rep.  ____________________________
__________________________  County Gov. rep.  ____________________________
__________________________  Other rep.  ____________________________

Treatment Endpoint Criteria:


Is treatment or further treatment required? (circle one)

YES - define below specific treatment action(s) and specific locations within the segment where required. Provide sketches, maps, GPS coordinates to Ops

NO FURTHER TREATMENT required - each UC rep sign appropriate signature box above

Comments:


