



# CONSIDERATIONS FOR ALL SAMPLING METHODS

## INTRODUCTION

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There are certain procedures or protocols that should be followed in most of the sampling methods described in this manual. These include:

- Handling and Storing Samples
- Data Collection and Management
- Safety
- Waste Management



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## HANDLING and STORING SAMPLES

### OBJECTIVE & STRATEGY

Samples collected through a Fisheries Water Quality Sampling program must be handled, stored, and documented properly in order to preserve the integrity of the sample for potential laboratory analysis. Special care must be taken to prevent cross-contamination and to protect chain-of-custody. For samples that will undergo laboratory analysis, the storage medium must ensure that the sample reaches the lab in the condition required for further testing. This may require that samples be chemically preserved, or that they be refrigerated. There may also be minimum size or volume requirements for running laboratory tests; special care should be taken to coordinate these issues with the lab prior to finalizing the sampling plan to ensure that samples will be stored and handled correctly.

### TACTIC DESCRIPTION

#### *Collecting, Handling, and Storing Samples*

Samples collected through a fisheries water quality sampling program may consist of: seawater; whole oil; sediments; whole oil mixed with debris; whole oil attached to a sampling device; whole oil on fishing gear; fish or shellfish (live or dead); or tissues from fish or shellfish. The storage container type, size, storage medium (cool, on ice, with or without preservative), and holding time, will vary depending upon the type of sample, the planned analyses, and the distance from the spill site to the laboratory. Sample containers should be constructed of materials that will not affect the concentration or chemical composition of the sample or any potential contaminants.

It is important to use the proper sample storage containers to avoid contamination of samples. Water samples are usually stored in amber bottles, with or without preservative, depending upon the planned analyses. The laboratory that will be analyzing the sample should be able to specify the necessary sample volume and bottle size, and may also be able to provide the sample bottles. Refer to the Whole Water Sampling Procedure for information regarding Alaska requirements for laboratory analysis of dissolved hydrocarbons.

Whole oil samples may also be stored in amber bottles or in other receptacles provided by the laboratory. Nitrile gloves should be worn at all times when handling samples. Toothpicks or other small, clean devices may be used to extract a small sample of whole oil for storage. Whenever possible, use photographs to document sample handling procedures.



### **Chain of Custody**

Samples collected through a Fisheries Water Quality Sampling program should be treated as evidence under the applicable ADEC standards. Section 8 of the ADEC Enforcement Manual (current edition) includes instruction on transmittal of evidence to laboratories and chain-of-custody procedures. The manual requires that a Request for Laboratory Services (RLS) Form 18-1401 be completed to record the acquisition, chain of custody, and disposition of samples collected as evidence to be transmitted to the laboratory for analysis. It is important that the Chain of Custody Record on the RLS be completed when receiving chain of custody sample containers, and when submitting chain of custody samples to the laboratory for analysis.

## **PROCEDURE**

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- 1. Identify the types of samples to be collected and the laboratory analyses to be performed.**
  - a. Coordinate sample storage and handling procedures with lab based on their analytic procedures.
- 2. Wear nitrile gloves and ensure all storage containers and devices used to handle the samples are clean and free of contamination.**
- 3. Collect samples and store in appropriate container.**
  - a. Seal container.
  - b. Use evidence tape or seal that will prevent tampering.
  - c. Mark each sample with identifying number.
  - d. Store as directed by laboratory (e.g., in cooler, out of direct sunlight, etc.).
- 4. Record data in sample log.**
  - a. Data may include date and time, location where sample was taken, sampler's initials, sample identification number (from chain of custody form).
- 5. Complete chain of custody form.**
  - a. Sampling technician is usually initial custodian of sample.
  - b. May transfer custody to intermediate person (Sampling Group Supervisor, other incident personnel) for secure storage pending laboratory transfer.
  - c. All samples must be stored in a secure location.
- 6. Transfer samples to laboratory.**
  - a. Hand deliveries are preferable but not always feasible.
  - b. If samples are transported by courier or express air, package to avoid damage, loss, or tampering.
  - c. Include copy of chain of custody form with all samples.



## CONSIDERATIONS AND LIMITATIONS

- + Samples may become evidence in criminal proceedings; be diligent in following procedures.
- + Keep duplicate copies of logbooks and custody forms.

## REFERENCES TO OTHER TACTICS

Other methods associated with Sample Handling and Storage include:

- All technical sampling methods
- Data Collection and Management

## EQUIPMENT AND PERSONNEL RESOURCES

Resources for Sample Handling and Storage may include: storage containers, nitrile gloves, coolers, chain-of-custody documentation, and sampling technician(s). The sampling tactics and laboratory analysis being used will determine specific resource needs. Resource sets may need to be refined as site-specific requirements dictate.

### *Sample Handling and Storage*

Equipment	Function	Quantity	Notes
Storage containers	Store samples in appropriate form for laboratory analysis.	Depends upon number of samples to be taken	Coordinate type of storage container with laboratory.
Preservative	Preserve water samples for some types of laboratory analysis.	Varies	Coordinate need for preservative and type/concentration with laboratory.
Storage area for samples	Maintain samples in safe and appropriate environment pending transfer to laboratory.	Varies	Storage may include refrigeration or coolers. Coordinate with laboratory.
Evidence tape or tamper-proof seals	Prevent tampering with samples.	Varies	
Chain-of-custody documentation	Track person responsible for maintaining samples from point of collection until transfer to laboratory.	Varies	May be available from ADEC or from the laboratory.
Nitrile sampling gloves	Prevent contamination of samples.	At least one box per sampling technician	Gloves come in variety of sizes. Do not use latex.
Digital camera	Record images of sampling process and observations.	One per sampling technician	Ensure sufficient batteries, charger, and memory stick storage for length of sampling survey.
Personnel	Function	Quantity	Notes
Sampling technician(s)	Handle and store samples.	Varies	Must coordinate with laboratory to ensure proper handling and storage.



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# DATA COLLECTION and MANAGEMENT

## OBJECTIVE & STRATEGY

Consistent, thorough data collection and management is critical to the success of a water quality sampling program's efforts to provide information to decision makers. Sampling technicians should maintain a detailed log of all sampling activities, recording a previously agreed upon set of data which is kept consistently over time. While different data sets will be collected depending on the sampling tactics used, questions being answered, and resources available, some basic rules of record keeping and data management will always apply. In general, data sets taken in a sampling program will describe what was observed, by whom, when, where, and how sample was obtained.

## CONFIGURATIONS

Data collected by sampling personnel may be recorded by hand in a logbook, electronically in a spreadsheet, as GPS track lines or waypoints, or as videos or photographs. Often, a combination of one or more techniques may be utilized.

The ADEC Enforcement Manual (current edition) requires that a field sample log be maintained by all state employees who are collecting evidence that may be used in criminal proceedings. Ensure that all data, including logs, are maintained in accordance with the procedures described in Section 7 of the Enforcement Manual.

## PROCEDURE

- 1. Design record keeping instruments and disseminate, with instructions, to all sampling technicians.**
- 2. Data collection devices may include any of the following, depending on the tactic(s) used:**
  - a. Logbook,
  - b. Computer,
  - c. Handheld or vessel GPS, and
  - d. Video or still camera.
- 3. The following types of data may be recorded during sampling operations, whether or not oil is found:**
  - a. Location (latitude/longitude coordinates – may be multiple coordinates for towing methods).
  - b. Water depth.



- c. Water temperature (if relevant).
- d. Weather or environmental conditions (if relevant).
- e. Identification number for data point (e.g., tow number, ID number for passive sampler).
- f. Date and time of observation (or sampling activity yielding no observation of oil).
- g. Personnel making observation or conducting sampling activity.
- h. Oil observed (or not): size/quantity, other descriptive qualities (tar ball, sheen, patty, mousse, etc...), mixture with vegetation or dirt, color.
  - i. Document using common terminology, and/or
  - ii. Photograph.
- i. Chain of custody/lab tracking number for samples taken for analysis.

**4. After data is collected, it can be analyzed using the appropriate combination of mapping or statistical analysis to answer questions regarding where oil is found, is not found, and how much is present.**

- a. Data from GPS units should be downloaded and used to verify data in logbooks.
- b. Logbook entries should be compiled in a spreadsheet.
- c. Chain of custody/lab tracking numbers should be compiled.

## **CONSIDERATIONS AND LIMITATIONS**

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- + Simple mistakes can disrupt critical data collection; be sure all necessary materials are present, functioning, and batteries of electronic devices charged.
- + When transferring or copying data, especially from logbooks into spreadsheets, transcription errors may occur. Always proof all data entries.

## **REFERENCES TO OTHER TACTICS**

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Other methods associated with Data Collection and Management include:

- All technical sampling methods
- Handling and Storing Samples



## **EQUIPMENT AND PERSONNEL RESOURCES**

Resources for record keeping and data management may include: logbook, camera, GPS (vessel or handheld), laptop computer, spreadsheet or mapping software, sampling technician(s), and data entry specialists. The sampling tactics being used and resource availability will determine specific resource needs. Resource sets may need to be refined as site-specific requirements dictate.

### ***Data Collection and Management***

<b>Equipment</b>	<b>Function</b>	<b>Quantity</b>	<b>Notes</b>
Logbook (e.g., Rite-in-the-Rain or similar field notebook)	Record findings, location, time, and personnel.	Varies; should be one for each sampling technician	
GPS (handheld or vessel)	Record location of tows, stationary sampling devices, or findings of oil.	Varies	
Laptop computer with spreadsheet or mapping software	Compile and present data for analysis to support decision making.	Varies	Some mapping applications can accept data directly from handheld GPS units. Spare battery.
Still or video camera and batteries or charger	Photograph or video documentation of field observations.	One per sampling technician	
Other data collection supplies, such as pens, dry bags to store cameras, etc.	Support data collection.	Varies	
<b>Personnel</b>	<b>Function</b>	<b>Quantity</b>	<b>Notes</b>
Sampling technician(s)	Deploy equipment, collect data.	Varies	Must be trained in record keeping and data management as relevant to the sampling program.
Data entry specialists	Enter data for analysis using spreadsheet or mapping software.	Varies	Must be competent with relevant software programs.



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## SAFETY



### OBJECTIVE & STRATEGY

Safety is the number one objective for spill response operations. Protection of worker health and safety should be a constant consideration throughout the spill response and monitoring activities. For the purpose of this manual, the safety tactics are directed at providing safety to sampling technicians working in environments where they are subjected to low levels of exposure to crude oil and petroleum products, but are possibly exposed to high levels of physical dangers. Since the primary consideration is on the mitigation of physical dangers in these environments, if significant exposure to oil and petroleum is expected sampling activities should be discontinued in that area.

The objective of this section is to protect the safety and health of sampling technicians, vessel crew and other workers by giving guidance on establishing minimum standards for sampling operations. Safety is always the primary objective of any activity during a response. **Either of the following two documents supersedes this guidance:**

- **Incident-specific Site Safety Plan**
- **Corporate or Agency safety procedures and training for employees/crew/responders**

The decisions regarding the safety of operations and whether or not to continue operations is ultimately the responsibility of the On-Scene Commander with advice and guidance from: The Site Safety Officer, The Field Team Leader, and Unified Command.

### TACTIC DESCRIPTION

#### *Site Safety Assessment*

In most sampling situations the physical hazards present a greater danger to workers than exposure to petroleum. Therefore, sampling operations should include a site specific safety plan that takes into account activities that will take place during all operations.

Before commencing oil sampling operations, a site safety assessment should be completed by a Site Safety Officer, or a properly trained field team member in coordination with the facility or vessel operators. Vessels should be inspected by the USCG and facilities should be compliant with all OSHA regulations. The team should assess the site's



physical hazards as well as chemical hazards so that proper decisions can be made regarding PPE and other safety and health issues. Once the site safety assessment and inspection is completed, the plan should be formalized and all workers and crew briefed and properly equipped.

The physical danger encountered during the sampling activities is similar in nature to that encountered by commercial fishermen. When operations are occurring in this environment, the crew must be proficient at executing emergency procedures and knowledgeable of the vessel's safety features. The technicians and workers must be briefed on the emergency procedures and safety features of the vessel.

The US Coast Guard has established the following "Ready for Sea" check list for individual fishermen to use prior to sailing. It should be used by technicians as well to familiarize themselves with the vessel and ensure safe operations.

- Weather:
  - Evaluated weather forecast. Vessel and crew can handle safely! Can monitor weather reports at sea.
- Crew:
  - Trained and drilled in operation of vessel and safety equipment. Work schedule minimizes fatigue.
- Stability:
  - Scuppers and freeing ports clear. Gear, catch and hatches secured. Limit accumulation of ice.
- EPIRB and Communications:
  - Equipment tested. EPIRB armed and mounted properly. Carry back-up comms.
- Immersion Suits:
  - Crew has donned suits to ensure proper fit & good condition. Suits accessible and lights attached.
- Survival Craft:
  - Capacity for entire crew. Serviced, properly installed and crew trained to launch.
- PFDs Worn on Deck:
  - Crew knows to wear PFDs or inflatable suspenders with lights on deck during operations.
- Damage Control:
  - Bilge pumps work. Damage control equipment on board and crew trained in use.
- Fire Fighting:



- Adequate number of serviced fire extinguishers on board and crew trained in fire fighting.
- Safety Exam:
  - I conducted “Ready for Sea” deck walk/safety inspection and determined vessel safe to sail.

### **Personal Protective Equipment-PPE**

Personal Protective Equipment is designed to protect workers from safety and health hazards, and to prevent injury resulting from incorrect use and/or malfunction of equipment. In general, the greater the level of risk, the greater the level of PPE required.

Throughout the sampling activities the level of exposure to petroleum and other chemical hazards should be minimized. The focus of the sampling plan will be on documenting and collecting representative samples. Large amounts of petroleum should not be encountered and the products that will be encountered will be weathered with most of the acute hazards mitigated. Follow each sampling plan’s directives on proper disposal of excess oil encountered during operations.

During collection and cleaning of equipment exposure will be most acute. PPE that is specific to oil hazards should be utilized during these activities. These activities would require a level of protection which will exclude contact with the oil and protect against cross contamination of personnel and equipment.

This is typically referred to as Level D protection and consist of:

- Coveralls
- Gloves
- Boots/shoes - chemical resistant, steel toe and shank
- Boots - covers appropriate to spill product
- Safety glasses or chemical splash goggles
- Hard hat
- Hearing protection
- Face shield
- Personal Flotation Device (PFD)

Operations occurring on and around bodies of water require the use of a personal floatation device at all times when on the vessel deck or other exposed situations.





## **CONSIDERATIONS AND LIMITATIONS**

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- + Request a "safety briefing" from the vessel captain or your team leader before conducting any sampling activity.
- + Maintaining adequate supplies of PPE is often difficult. Team Leaders should provide and supply anticipated PPE needs on a regular basis.
- + Assure proper fastening and fit for PPE and PFD.
- + Establish plans to avoid contamination of the vessel and facilities used in sampling activities.
- + When underway the vessel master is responsible for safety of the passengers and crew.
- + Good communications during deck operations are critical to safe operations.
- + Hard hats must be worn at any time overhead operations are taking place.
- + Report all suspected unsafe operations.
- + Never work on a vessel deck alone.
- + Never leave the vessel cabin/house without informing others.
- + Have a designated and easily accessed survival suit available to all persons aboard.
- + A planned schedule of communications with Unified Command should be in place to establish the vessel safety when underway. Procedures must be in place to address missed communications.

## **REFERENCES TO OTHER TACTICS**

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Other methods associated with Sampling Safety include:

- Handling and Storing Samples
- All technical sampling methods



# WASTE MANAGEMENT

## OBJECTIVE & STRATEGY

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Waste Management is important to ensure that all oil and oily waste generated by the sampling program be appropriately disposed of as part of the incident waste stream. Before developing a sampling program, a copy of the incident Waste Management Plan should be reviewed to ensure that sampling program waste management fits into the overall waste management strategy. For the purpose of this manual, the Waste Management strategy describes those procedures that may be used to collect and store waste generated by the sampling program and to transfer that waste into the incident waste stream according to the incident waste management plan.

This strategy applies to all types of oily waste, including liquid and solid waste, and any materials (e.g., gloves, equipment) that have been contaminated by oil. Non-oily wastes should be disposed of properly and according to either the incident waste management plan or local regulations.

## TACTIC DESCRIPTION

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### ***Deployment Configurations***

Proper waste management and disposal require appropriate containers. These may be small or large plastic bags that can be closed securely. A means of documentation is also required, such as a logbook for recording the date, time, and location of waste collection, and the volume of oily waste collected.

Any oil or oily waste generated by the sampling program and not retained as a sample must enter the incident waste stream.

## PROCEDURE

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Segregate all wastes into liquid or solid.

### ***Liquid Waste Management***

- 1. Place liquid oily waste in approved container (e.g., 55-gallon drum, slop tank, etc.). Water and decontamination solution used to decontaminate oiled sampling equipment should be treated as oily waste.***
- 2. Document:***
  - a. Date.
  - b. Time.
  - c. Volume of waste generated (estimate).



- 3. Dispose of liquid oily waste according to incident waste management plan.**
- 4. It is against the law to discharge oily wastes directly to water or land.**

**Solid Waste Management**

- 1. Place solid oily waste in approved container (e.g., waste bag).**
- 2. Document:**
  - a. Date.
  - b. Time.
  - c. Volume of waste generated (estimate).
- 3. Dispose of solid oily waste according to waste management plan.**

**CONSIDERATIONS AND LIMITATIONS**

- + Personal protective equipment, such as gloves, should be used as necessary when handling oily waste.
- + Sampling personnel who come into contact with oil or oily waste must have the requisite hazardous materials training.
- + Adequate storage must be on hand at all times for proper disposal of oily waste.

**REFERENCES TO OTHER TACTICS**

Other methods associated with Waste Management include:

- Data Collection and Management
- Safety

**EQUIPMENT AND PERSONNEL RESOURCES**

Required resources include appropriate containers, documentation materials, and trained sampling technicians. Specific resources required will be determined by spilled oil type and volume, area of coverage, and resource availability. Resource sets may need to be refined as site-specific requirements dictate.

**Waste Management**

Equipment	Function	Quantity	Notes
Approved containers	Store oily wastes until disposal under waste management plan is possible.	Depends on anticipated type and volume of oil encountered	
Log books and data collection supplies	Record data regarding oil observations, conditions, etc.	Varies	Refer to Data Collection and Management Procedure.
Digital camera	Record images of sampling process and observations.	One per sampling technician	Ensure sufficient batteries, charger, and memory stick storage for length of sampling survey.
Personnel	Function	Quantity	Notes
Sampling technician(s)	Collect waste and data.	Varies	Technicians must have sufficient Hazmat certification and familiarity with waste management plan.