

**EPA FRAMEWORK FOR A
MODEL WASTE MANAGEMENT PLAN
FOR OIL SPILLS OF NATIONAL SIGNIFICANCE (SONS)**

July 24, 2013

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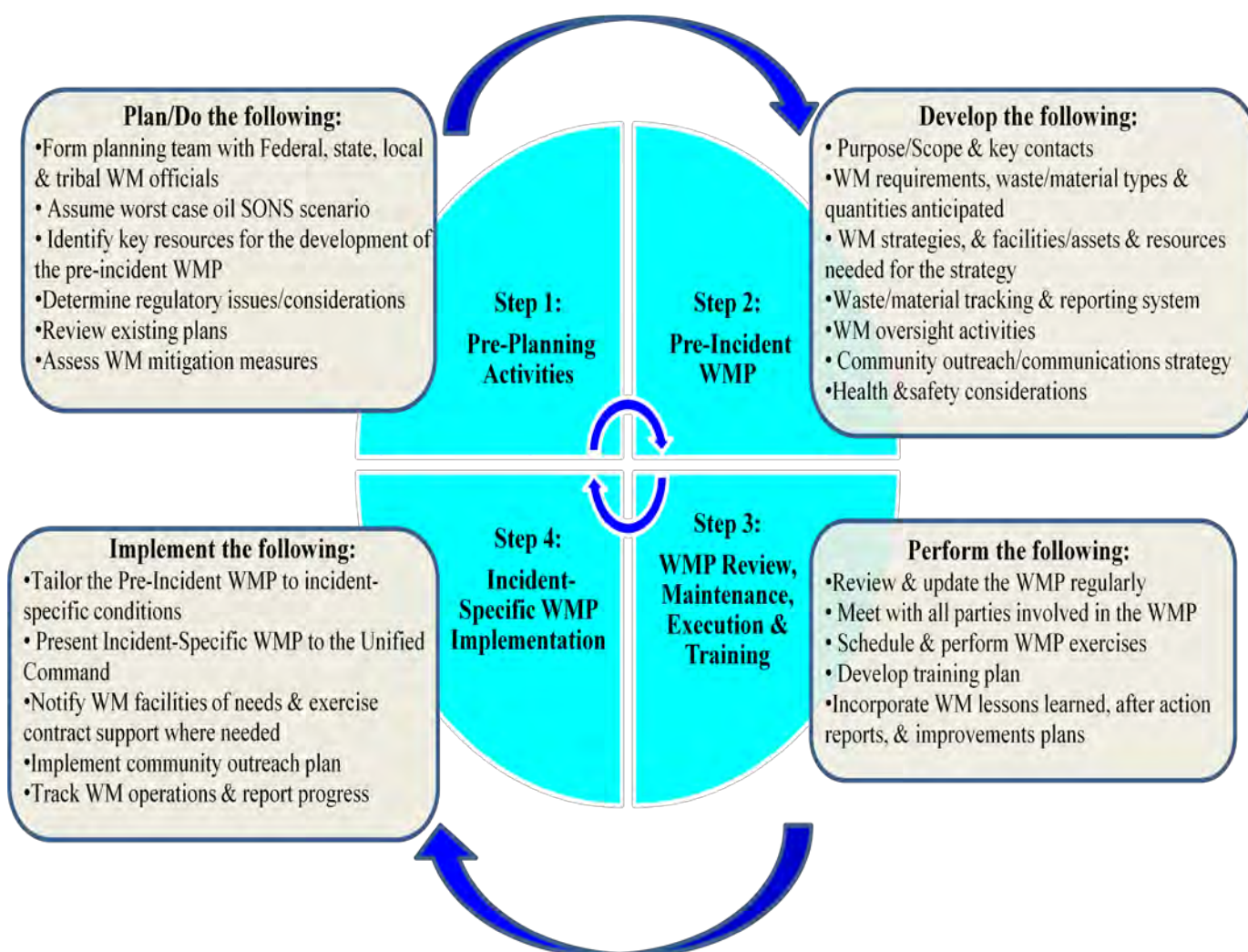
Purpose

The purpose of this framework for a model waste management plan is to provide to EPA emergency managers, planners, and responders the key elements of waste management planning for an oil discharge that is declared a Spill of National Significance (SONS). The National Oil and Hazardous Substances Pollution Contingency Plan's (NCP) contingency planning process utilizes Area Committees comprised of members from federal, state, territorial, and local levels of government (e.g., EPA, U.S. Coast Guard, On Scene Coordinators (OSCs), Regional Response Teams), as well as non-governmental organizations. Other waste management resources (e.g., petroleum industry, waste management facility owners/operators) may also be useful to include in the planning process. These Area Committees are involved in developing Regional Contingency Plans (RCPs) and Area Contingency Plans (ACPs) in accordance with the NCP, 40 CFR Part 300. A SONS is "a spill that, due to its severity, size, location, actual or potential impact on the public health and welfare or the environment, or the necessary response effort, is so complex that it requires extraordinary coordination of federal, state, local, and responsible party resources to contain and clean up the discharge" (NCP, 40 CFR§300.5). Experience with major oil discharges has shown that many of the waste management planning elements are similar and can be planned for ahead of time, which can then be tailored to the site-specific spill conditions at the time of the SONS. Although an oil SONS will likely involve a responsible party, past incidents have shown that these key elements should be planned for by all stakeholders and be documented within a pre-incident waste management plan and made part of appropriate RCPs and/or ACPs. The initial step for regional emergency managers, planners, and responders in preparing this plan should be to collect existing public and private sector emergency response plans that may contain some of the waste management elements that are identified in this document. For example, Debris Management Plans, commonly utilized for natural disasters, and Facility Response Plans, as required in 40 CFR § 112.20 for certain oil-related exploration or production facilities, as well as other emergency response plans, may provide some of the information needed to create a waste management plan for a SONS.

Application

This framework for a model waste management plan for a SONS is intended to reflect the necessary planning elements to prepare for the waste management demands of a SONS as part of inland and coastal RCPs and ACPs. The creation of this plan is part of a four step waste management planning process that covers (1) pre-incident planning activities, (2) pre-incident plan development, (3) training on the various elements of the plan and execution of the plan through operational and tabletop exercises, and (4) incident-specific implementation (Figure 1). Most of the effort in effective waste management planning for a SONS should take place in the pre-incident stage, so that efforts during an incident can focus on tailoring the pre-incident plan to incident-specific conditions as the response unfolds. This framework reflects actual lessons learned and actions taken by the EPA and the U.S. Coast Guard (USCG) during the Deepwater Horizon (DWH) SONS in 2010. This framework also is intended to fulfill a corrective action associated with the EPA's Office of Inspector General Report No. 11-P-0706, "EPA Should Clarify and Strengthen its Waste Management Oversight Role With Respect to Oil Spills of National Significance," September 26, 2011.

Figure 1. Four Step Waste Management Planning Process



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1.0 PURPOSE, SCOPE & KEY CONTACTS

Purpose and Scope of the Waste Management Plan

A waste management plan for an oil SONS response should be a dynamic document that can expand with the incident as it unfolds and is robust enough to address a worst-case scenario. It should include appendices to address state-specific waste management requirements. The purpose and scope of a waste management plan for a SONS response include:

- Protecting human health and the environment associated with waste management activities throughout the affected area;
- Identifying waste management regulatory, staffing, and resource needs across all affected states and regions;
- Identifying the types and quantities of wastes that are likely to be generated from a SONS (estimates can be used from past oil spill experiences);
- Developing a waste sampling and analysis process to characterize the wastes;
- Establishing waste management strategies for each waste type, including collection, segregation, staging, temporary storage, minimization, treatment, and disposal;
- Identifying and assessing waste recycling, treatment, storage, and disposal facilities that can process the amounts of waste anticipated;
- Identifying waste acceptance criteria, sampling, labeling, and tracking requirements for each waste management facility that may be utilized in the waste management response;
- Developing a transportation plan describing how wastes should be transported from their point of generation to a waste management facility;
- Establishing waste tracking and reporting processes to provide transparency in waste management operations;
- Establishing waste management oversight activities and an exit strategy for waste management activities;
- Establishing community outreach and communications processes;
- Establishing health and safety practices in support of waste management activities; and
- Reducing the overall cost of waste management activities through effective waste management planning across the affected area.

Key Federal, State, Local, Tribal, and Territorial Contacts

This section should identify the key points of contact for the federal, state, local, tribal, and territorial governments (governments), as well as key asset managers, including owners/operators of key public and private sector waste management facilities. It should include emergency phone numbers and emails of the appropriate waste management officials who will be coordinating and executing the waste management plan.

SECTION 2. WASTE MANAGEMENT REQUIREMENTS, WASTE TYPES & QUANTITIES

This section of the waste management plan should attempt to identify the major waste management requirements for each type of waste that may be associated with a SONS. This should include applicable requirements at the local, state, and federal levels. What makes a SONS unique is that it can span a large geographical area, covering different response regions, territories, and states. While there are federal standards for management of solid and hazardous wastes, most state programs have been approved or authorized to operate in lieu of the federal program. States may also have regulations or requirements that are

more stringent or broader in scope than federal requirements. As a result, it is important that emergency managers, planners, and responders identify and reflect these differences in waste management requirements in waste management plans.

State, Local, Tribal, and Territorial Waste Management Requirements

State, local, tribal, and territorial waste management resources may be overwhelmed in a SONS response. The magnitude of wastes generated, the wide area affected, and the types of wastes generated may make it difficult to find public and private sector waste management facilities that can or will accept the waste. Therefore, it is important that waste management plans are robust enough to address the magnitude of the response needed for a SONS. States and local governments may already have in place administrative orders or emergency declarations that address state or local waste management requirements and operations in response to a SONS. These orders and declarations may already address procedures for establishing staging areas, listing potential landfill sites, identifying waste manifest signature delegation authority for the generator, and prescribing the types of materials that may be sent to particular types of facilities. These orders and declarations may also allow certain additional materials to be disposed of in these facilities, consistent with state laws and any additional measures that need to be taken for this disposal to occur. As a result, it is important that state, local, tribal, and territorial waste management requirements and any private sector waste management plans be reflected in the development of a waste management plan as part of the RCPs and/or ACPs for each state and region. The waste management plans should also be flexible and acknowledge that as the response unfolds affected governments may amend or issue new administrative orders or emergency declarations.

Waste/Material Types Anticipated

Previous large oil spills have provided insights into the types of wastes and materials expected from a SONS, as well as the typical approaches utilized in response to a SONS. However, spills may have unique elements that factor into waste management decisions. These include differences in the physical and chemical properties of the products involved (e.g., light crude, heavy crude, refined oil, shale oil), how the oil is released (e.g., release from a vessel, well blowout, pipeline break), weather conditions, the use of different types of dispersants, and environmental conditions. The typical types of wastes and materials from a SONS are shown in Table 1 below.

Table 1. Waste/Materials Types from a SONS

WASTE TYPE	WASTE DESCRIPTION
Oily Solids	Oil-contaminated material that may include debris, soil, sand, boom, and vegetation; weathered oil (e.g., tar balls); oily personal protective equipment (PPE); disposal equipment; sorbents
Non-oily Solids	Non-oiled material that has been recovered from support operations of the cleanup activities, including office trash, non-oiled beach debris, general garbage, non-oiled vegetation
Medical Waste	Sharps, syringes, PPE, & other medical-related material generated from operations at wildlife rehabilitation centers or command centers

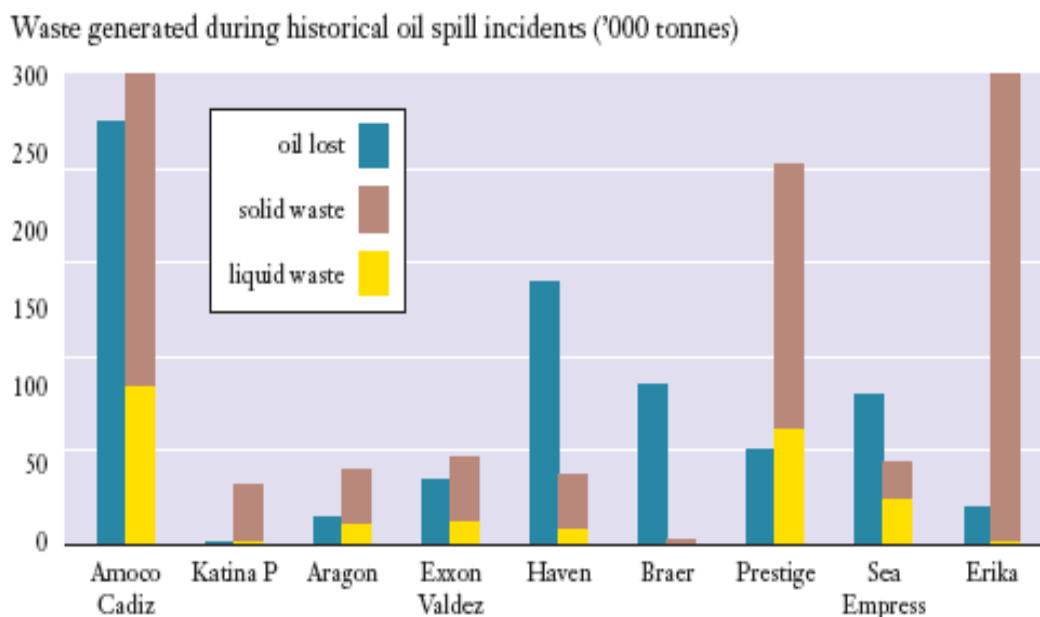
Oily Liquids	Oil and water mixtures or emulsions (e.g., from skimming or oil recovery operations)
Liquids	Primarily water that may have an oily sheen or contain minor amounts of free oil droplets (e.g., onshore decanted water, storm water, decontamination water, treated water)
Recyclable/Recoverable Materials	Plastic bottles, hard boom, aluminum cans, scrap metal, glass, cardboard, soft absorbent boom
Incident/field-related Laboratory Waste	Incident-related wastes generated by decontamination of the sample collection equipment and analysis of samples at on-site incident-related laboratories, including designated research vessels
Hazardous Waste	Non-exempt oil and gas production wastes that are listed hazardous wastes or exhibit hazardous waste characteristics
Animal Carcasses	Animal carcasses identified during shoreline cleanup or generated from operations at the wildlife rehabilitation centers
Laboratory Analysis Waste	Analytical sample wastes generated from the analyses of samples at fixed analytical laboratories
Raw Sewage	Waste generated by the large number of cleanup crews needed in response to an Oil SONS. Typically, this waste is collected in Port-o-Johns placed to support cleanup crews.

Quantities of Different Waste Types Anticipated

Knowledge of the types and sizes of prior oil spills can be valuable in estimating the quantities and types of wastes generated compared to the amount of oil released. The quantities and types of wastes anticipated also are influenced by the physical and chemical properties of the products, the type of release, weather conditions, the use of dispersants, and environmental conditions. IPIECA's historical data (Figure 2) show that oil spills impacting the shoreline can produce up to 30 times more waste than the volume of oil spilled.¹

¹ Guidelines for Oil Spill Waste Minimization and Management, IPIECA, 2004, pg. 3;
http://www.ipieca.org/library?tid=8&tid_1=12

Figure 2. Waste Generated During Historical Oil Spill Incidents



This information, along with the breakdown of different types of waste generated during previous oil spills (Table 2), provides an excellent tool for forecasting the quantities of waste that are likely to be generated during a SONS response. This information also assists in planning for the sampling and analysis of these waste types and quantities.

Table 2. Waste Types & Quantities for the 2010 Deepwater Horizon Oil Spill

WASTE TYPE	TOTAL	UNITS
Oily Liquid ^a	459,781	Oil Barrels
Liquids ^{a,b}	949,468	Oil Barrels
Oily Solids ^{a,b}	96,279	US Tons
Solid Waste ^a	13,911	US Tons
Recyclables/ Recoverables	4,769	US Tons

a. Material that has been manifested to a recovery or disposal facility

b. Recently verified past data has been incorporated into this report

Source: Deepwater Horizon Website; Data as of December 31, 2011

Waste Sampling and Analysis

Standard sampling and analysis methodologies (Table 3), frequencies of sampling, and data reporting of each of the anticipated waste streams should be identified in a Waste Sampling and Analysis Plan as part of the overall Waste Management Plan. This will allow responders to determine the characteristics of the waste and identify appropriate receiving waste management facilities. This is important because waste management facility permits typically contain facility-specific waste acceptance criteria² and waste generators may be required to complete facility-specific waste profiles before the waste management facility can accept the waste. Sampling and analysis of waste streams also provide information necessary for developing Health and Safety Plans for response workers, waste management facility operators, and waste haulers. As the response unfolds, it may be appropriate to amend the Sampling and Analysis Plan to reflect potential changes in waste streams.

Table 3. Example of a Waste Sampling and Analysis Table Common to an SONS Response

Matrix	Description	Sampling Frequency	Analysis	Handling	Disposal
Solid	Oil-impacted material that may include debris, soil, sand, vegetation; solid weathered oil (e.g., tar balls); PPE; disposal equipment; sorbents; etc. Material shall be drained of recoverable oil, as practicable (oil shall be collected for potential re-processing or other use).	Once per week	TCLP SW 846 1311/ VOCs by SW 846 8260C TCLP SW 846 1311/ SVOCs by SW 846 827070D TCLP SW 846 1311/ Metals by SW 846 6010C & SW846 7471A Paint Filter Test SW846 Method 9095	Appropriate containers (i.e., lined or sealed) transported by approved waste hauler	Approved disposal facility
	Non-oily solids that may include municipal waste material that has been recovered from support operations of the cleanup activities, including trash and garbage.	None required	None	Containers transported by approved waste hauler	Approved disposal facility

² See, for example, August-Richmond County Municipal Solid Waste Landfill Waste Acceptance Criteria, Feb 2007; <http://www.augustaga.gov/DocumentView.aspx?DID=426>

Liquid	Water, oil, and emulsion collected during skimming operations, by vacuum truck from decontamination facilities, management of storm water at land-based decontamination sites, etc. This category also includes excess decontamination water that accumulates during the closed loop decontamination process.	As needed basis based on final disposition of liquid	TCLP SW 846 1311/ VOCs by SW 846 8260C TCLP SW 846 1311/ SVOCs by SW 846 827070D TCLP SW 846 1311/ Metals by SW 846 6010C & SW846 7471A Ignitability by SW846 Chapter 7	Appropriate container (e.g., vacuum truck) transported by approved waste hauler. Storage in frac tanks at staging area prior to transport. Barge transportation and storage.	Approved recovery/disposal facility
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Further information regarding a Waste Sampling and Analysis Plan for a SONS can be found at: http://usresponse.bp.com/external/content/document/2911/963703/1/Appendix_B_Waste_Sampling_Plan.pdf.

Waste Management Quality Assurance

A waste management quality assurance project plan (QAPP) may also be useful for a SONS response because of the amount of waste management data that will be generated from sampling and analysis, as well as for the long period of time over which this data may be collected. A QAPP lays out waste management sampling and analysis objectives; the organization of and responsibility for waste management sampling and analysis efforts; data quality objectives; quality control measures; sampling and analysis procedures; calibration procedures; preventive maintenance; data reduction, validation, and reporting; and performance and system audits. Table 4 contains information commonly included in a QAPP to ensure that the quality measures inherent with specific waste analytical methods are adhered to during sampling and analysis.

Table 4. Example of Analytical Quality Assurance Criteria Common to an Oil SONS

Analyte	Analytical Methods	Matrix	Container	Preservation	Minimum Sample Volume	Holding Time to TCLP Extraction	Holding Time from TCLP Extraction to Analytical Prep	Holding Time for Analytical Prep to Analysis
TCLP VOCs	SW846 1311/8260C	Solid or Liquid Waste	Glass	$\leq 6^{\circ}\text{C}$	16 oz	14 days	NA	14 days
TCLP SVOCs	SW846 1311/8270D	Solid or Liquid Waste	Glass	$\leq 6^{\circ}\text{C}$	16 oz	14 days	7 days	40 days
TCLP Metals	SW846 1311/6010C 1311/7470A	Solid or Liquid Waste	Glass	$\leq 6^{\circ}\text{C}$	16 oz	180 days	180 days	180 days
TCLP Mercury	SW846 1311/7470A	Solid or Liquid Waste	Glass	$\leq 6^{\circ}\text{C}$	16 oz	28 days	28 days	28 days

Ignitability	SW846 Chapter 7	Solid or Liquid Waste	Glass	$\leq 6^{\circ}\text{C}$	16 oz	NA	NA	14 days
Paint Filter Test	SW846 9095B	Solid or Liquid Waste	Glass	$\leq 6^{\circ}\text{C}$	16 oz	NA	NA	NA

Further information regarding a waste management QAPP for a SONS can be found at:

http://usresponse.bp.com/external/content/document/2911/963699/1/Appendix_B_1_QAPP_webversion_CO MBINED.pdf.

SECTION 3. STRATEGIES, FACILITIES & ASSETS

Emergency managers, planners, and responders should evaluate waste management strategies, facilities, and assets (e.g., equipment, supplies, personal protective equipment) to ensure that they can handle the anticipated waste types and quantities to be generated from cleanup operations.

Waste Management Strategies for a SONS

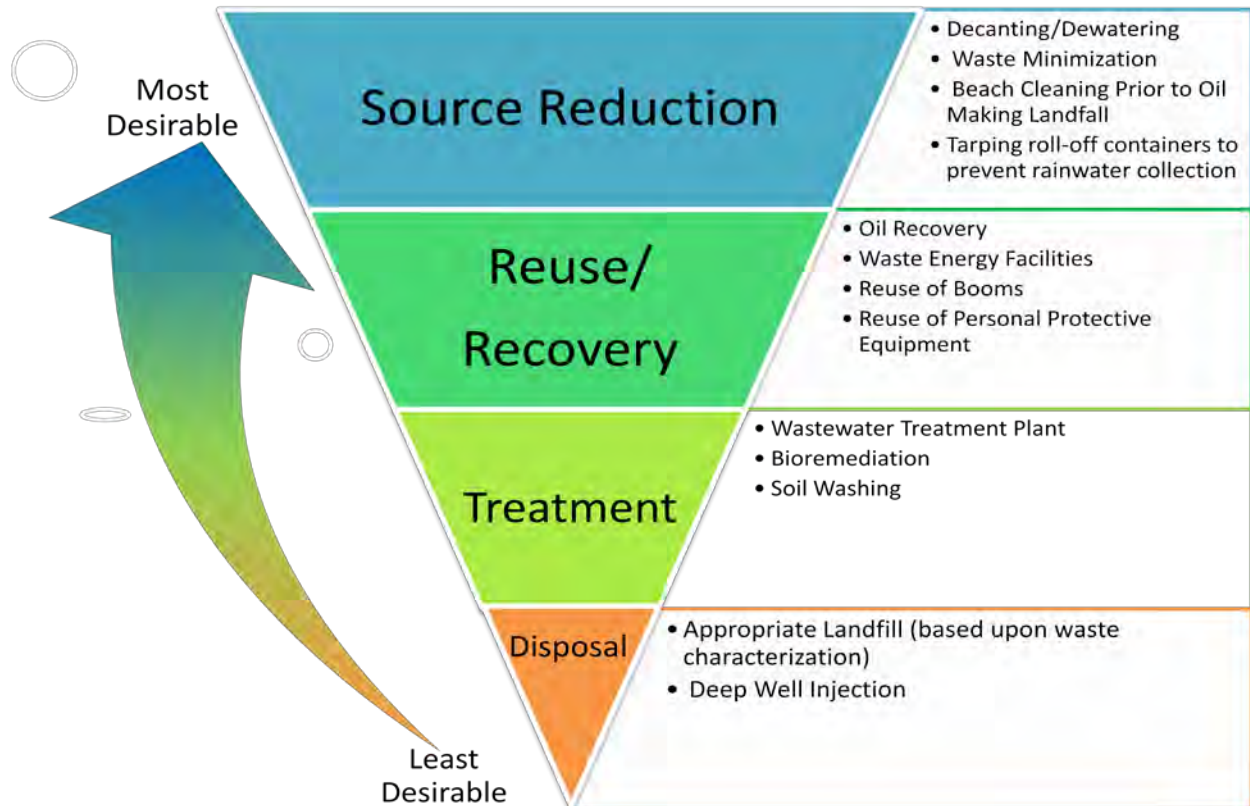
Emergency managers, planners, and responders should pre-identify best waste management practices during a SONS, including, as applicable:

- a. Identifying potential impact sites before oil has reached the shoreline and clear them of debris to reduce the amount of contaminated wastes to be handled;
- b. Segregating different types of wastes (liquid, solid, debris, personal protective equipment (PPE), hazardous, non-hazardous) wherever possible;
- c. Implementing procedures to prevent spills, rainwater infiltration, and runoff at waste management sites;
- d. Labeling all waste containers and identifying the location they came from;
- e. Cleaning and reusing recovery equipment whenever possible, rather than discarding after one use;
- f. Using reusable personal protective equipment wherever possible;
- g. Reducing secondary contamination from the spread of oil by people, transportation, or equipment;
- h. Placing solid waste in lined and bermed areas for subsequent management;
- i. Placing oil-contaminated materials in closed-top, 55 gallon drums, sealed plastic bags, or roll-off boxes for temporary storage, all segregated within lined/bermed secondary containment areas;
- j. Avoiding mixing any oil or oily wastes with non-oiled waste and avoiding mixing hazardous and non-hazardous wastes;
- k. Preventing oily wastes from contaminating soil by using liners underneath drums, tanks, and decontamination sites;
- l. Using sorbent pads and booms until they become moderately oiled;
- m. Minimizing day-to-day non-hazardous waste generated as part of response activities; and
- n. Properly categorizing, segregating, listing and transporting wastes accumulated in temporary storage locations.

Applying Waste Management Strategies in Response to a SONS

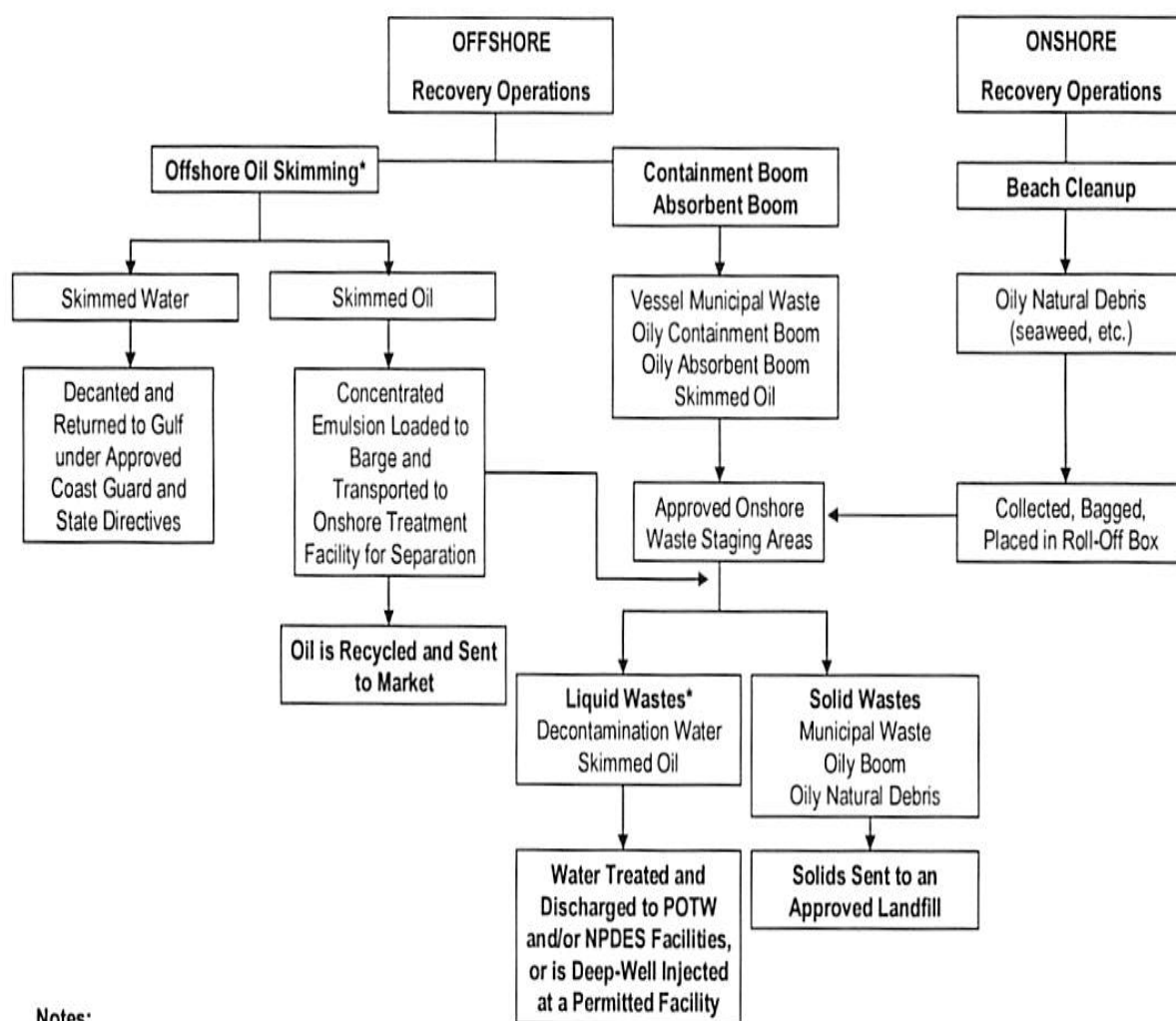
A hierarchy common to waste management operations places source reduction as the preferred option, followed by reuse or recovery and treatment, with disposal being the least desirable, and often the most expensive, option (Figure 3). Applying this hierarchy to an oil SONS waste management plan would commonly result in these best waste management practices:

Figure 3. Waste Management Hierarchy and Practices



Emergency managers, planners, and responders can use these best waste management practices (Figure 3) to develop a strategy for waste management activities. They may develop a waste and material handling flow diagram to identify a “cradle to grave” process flow of waste management activities for a SONS to include where waste will be generated, what waste will be generated, how much will be generated, the rate of waste generation, and the physical state (solid, liquid, gas) of the waste. It also may reflect the proper waste characterization and management approaches that meet all applicable government requirements. The figure below (Figure 4) represents a high-level process flow of wastes and materials management for a SONS. A flow diagram like this enables waste management decisions for a SONS based upon an understanding of the incident, the release, and the overall response strategies.

Figure 4. Typical Waste and Material Flow Diagram for an Oil SONS



Notes:


* Liquid waste management is covered in detail in the Liquids Waste and Materials Management Plan included in Appendix A

POTW - Publicly-Owned Treatment Works

NPDES - National Pollution Discharge Elimination System

Many waste treatment, storage, and disposal facilities and other assets (equipment, supplies, etc.) may be needed to support the types and quantities of waste associated with a SONS. These assets may be needed over a large geographic area, often including facilities and assets outside of the area directly affected by the spill. As a result, emergency managers, planners, and responders may further define this high level strategy to more specifically identify the resources and assets required. Table 5 below provides a useful way of beginning the process of assessing the resources that will be needed to support the high-level strategy outlined in Figure 4.

Table 5. Resource Needs to Support Waste Management Strategies for a SONS Response

Generation Location or Retrieval Activity	Waste/Material Type	Verification / Manifesting	Transport	Quantity and Quality?	Disposition
					
Operations Staging Areas	Solid Wastes	On-site consolidation, transfer to waste staging area for further consolidation and manifesting	Roll-off box	Generally not sufficient quantity of uniform material to be considered for recycling	Approved landfill
Vessels of Opportunity Deployment Locations	Solid Wastes Oily Solids	On-site consolidation, transfer to waste staging area for further consolidation and manifesting	Roll-off box	Generally not sufficient quantity of uniform material to be considered for recycling	Approved landfill
On-Shore Decontamination Stations	Solid Wastes Oily Solids Liquids Oily Liquids	On-site consolidation, transfer to waste staging area for further consolidation and manifesting	Roll-off box (solids) Vacuum truck (liquids)	Generally not sufficient quantity of uniform material to be considered for recycling	Approved landfill (solids) Approved recycling, treatment, or disposal facility (liquids); water is separated, treated and discharged via POTW.
Shore-line Cleanup Operations	Solid Wastes Oily Solids	On-site consolidation and manifesting, or transfer to waste staging area for further consolidation and manifesting	Roll-off box	Oily solids that are uniform and have sufficient quantity of oil for recovery are sent for recycling	Approved landfill (solids); oily solids may be segregated for potential future recovery efforts
Skimming Operations	Oily Solids Liquids Oily Liquids	On-site consolidation, transfer to waste staging area for further consolidation and manifesting	Barge or vessel	Materials that are uniform and have sufficient quantity of oil for recovery are sent for recycling	Approved landfill (solids) Approved recycling facility; oily solids (e.g., sorbent boom) may be centrifuged and separated oil sent for recycling Approved recycling, treatment, or disposal facility (liquids); water is separated, treated and discharged via POTW.

Waste Management Facilities & Assets

The history of oil spill responses shows the potential need for the following waste management facilities and equipment, which should be pre-identified and planned for to support a SONS response:

- a. Waste staging and storage locations;

- b. Equipment staging and storage locations;
- c. Decontamination stations (for boom, vessels, personnel, equipment, recovered water, etc);
- d. Oil recovery and recycling facilities;
- e. Water recovery facilities;
- f. Solidification facilities;
- g. Wastewater treatment facilities;
- h. Hazardous and solid waste treatment facilities and landfills;
- i. Waste transfer stations;
- j. Deep well injection facilities;
- k. Medical waste incinerators;
- l. Municipal solid waste or hazardous waste incinerators;
- m. Vacuum trucks;
- n. Barges, private boats, and other vessels;
- o. Off-road vehicles, aircraft, and helicopters;
- p. Oil skimming devices;
- q. Oil tankers or barges for collecting skimmed oil;
- r. Oil/water pumps, separators, tanks, and trucks;
- s. Waste and dump trucks and front end loaders;
- t. Roll-off bins;
- u. Plastic bags, carboys, booms, and spill control equipment;
- v. Sampling equipment and supplies; and
- w. Personal protective equipment.

To manage and monitor a waste management operation during a SONS, the Federal On-Scene Coordinator (FOSC) may want to maintain tables³ to track all of the waste management facilities utilized during the response. The FOSC may find it helpful to maintain maps⁴ showing the location of these facilities on a publicly accessible website to enhance public transparency.

To ensure that the proper waste management method is applied for each waste type, emergency managers, planners, and responders should evaluate the technical considerations for each of the waste management techniques above and any others to be incorporated in the waste management plan.⁵ Fortunately, there is a substantial amount of information available from past large oil spills on the capacity, uses, and equipment needs, as well as the pros and cons for each of these different methods.⁶ Additional waste management planning resources are included at the end of this model waste management plan.

In addition to the types of waste management facilities needed, it may be useful to preliminarily identify specific facilities that may be used during the response. As noted in Figure 5, there are not many hazardous waste management facilities across the country. So, depending upon where the incident occurs and the types of wastes generated, transporting waste to an appropriate facility may be a significant issue. In addition, each waste management facility has operating permits issued by the appropriate federal or state waste management authority. Each facility has specific waste acceptance criteria and waste characterization requirements that must be met before waste may be shipped to it.

³ Table of Deepwater Horizon Waste Management Facilities, Accessed on the Deepwater Horizon Oil Spill Website, Feb 2012; http://usresponse.bp.com/external/content/document/2911/995083/1/Waste_Disposal_Locations%20%2012511.pdf

⁴ Maps accessed on the Deepwater Horizon Oil Spill Website, Feb 2012; <http://usresponse.bp.com/go/doc/2911/962795/Location-of-staging-areas-and-landfill-disposal-facilities>

⁵ Guidelines for Oil Spill Waste Minimization & Management, IPIECA, 2004, pgs 15-16; http://www.ipieca.org/library?tid=8&tid_1=12

⁶ Oil Spill Response Manual, ExxonMobil, 2008, Section 14.6; http://www.crrc.unh.edu/dwg/exxon_oil_spill_response_field_manual.pdf

Figure 5. US Hazardous Waste Landfills, Incinerators & Low Level Radiological Waste Facilities



Source: RCRA Info, 2008

In addition to the hazardous waste management facilities in Figure 5, there are many solid waste management facilities across the country that are permitted and overseen by state, local, and tribal waste management officials. These facilities also have different designs, acceptance criteria, and permit conditions so utilization of a solid waste management facility for a SONS still calls for coordination, approval, and perhaps emergency authorizations from state, local, and tribal waste management officials.

Evaluation of Waste Management Facilities & Assets

A response to a SONS is a highly visible event that can be expected to draw intense attention from the public and the media, as well as federal, state, local, and tribal waste management officials. As a result, emergency managers, planners, and responders may want to evaluate potential waste management facilities (e.g., landfills, staging and decontamination areas, recyclers, waste water treatment plants, deep well injection sites) and equipment prior to an incident and document this within the pre-incident waste management plan. This will make it much easier and faster to include them in the incident-specific waste management plan that will be approved by the Incident Command (IC) or Unified Command for use during a SONS response. This assessment should include the following considerations (Table 6):

Table 6. Considerations for Evaluation of Potential Waste Management Facilities

• Waste Compatibility	• Insurance	• Site Closure Planning
• Facility Capacity	• Safety Record	• Adjacent Properties

• Facility Acceptance	• Community Relations	• Storm-water Controls
• Financial Status	• Public Acceptance	• Spill Control Plans
• Distance	• State Concerns	• Drum/Container Storage
• Costs	• Environmental Monitoring	• On-site Laboratory
• Compliance History	• Environmental Justice	• Recordkeeping

The plan should identify the potential waste management facilities and equipment that may be needed to manage the waste from a SONS, taking into account the considerations identified in Table 6. These facilities and equipment are owned by both the public and private sectors, and, therefore, those stakeholders should be included as part of this planning process. Taking the time to identify these resources with the key stakeholders that own and operate them is one of the most important indicators as to whether an RCP or ACP is sufficient to support a SONS response. The other key component is actually testing the waste management plan during exercises that include the key waste management stakeholders. An example of a spreadsheet that emergency managers, planners, and responders may want to develop and include as part of this plan is identified in Figure 6.

Figure 6. Waste Management Facilities and Asset Preparedness Spreadsheet

Recovery, Recyclers, Treatment, Disposal, and Other Facilities*

Name of Facility	Type of Facility	Waste Description	Permits	Type of Liner?	Has leachate collection system?	Permitted/ Average Capacity per Day	Total Remaining Capacity	Compliance/ Permit /Groundwater Monitoring Issues History (last three years)	Environmental Justice /Community Concerns (3 mi study area)	Contacts	Source
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* Landfills (hazardous and non-hazardous), Oil Recovery and Recycling, Wastewater Treatment, Deep Well Injection, Medical Waste Incinerator, Water separation/recovery and solidification, Waste Transfer Stations, Municipal solid waste or hazardous waste incinerator

Staging, Decontamination Facilities and Other Assets**

Name of Facility	Type of Facility or Asset	Material Staged/Activity/ Waste Description	Environmental Justice/Community Concerns? (3 mi study area)	Contacts	Source
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** Waste/Equipment staging and storage locations; Decontamination stations; Vacuum Trucks; Private Boats; Off-road vehicles; Oil Skimming devices; Oil Tankers/Barges; Oil/Water pumps, separators, tanks and trucks; Waste /Dump Trucks; Front end loaders; Roll off bins; Beach Cleaning Equipment; Plastic bags, carboys, booms, and spill control equipment; Sampling equipment/supplies, PPE

Transportation Considerations

During the waste management activities for a SONS response, operations will often occur on shore (beaches, ports, marshes, etc.), at sea or on inland waterways, and inland. A SONS response will involve

transportation of a tremendous amount of different types of waste in many different kinds of vehicles, vessels, and containers. Transportation of waste may be regulated by EPA and approved or authorized states, as well as the federal Department of Transportation and state departments of transportation, which may call for a great deal of pre-planning, logistics, and oversight. A SONS response may involve the use of dump trucks, front-end loaders, pump trucks, all-terrain vehicles, aircraft, boats, skimmers, helicopters, oil tankers, private boats, and other vehicles and vessels. As a result, emergency managers, planners, and responders may want to develop a transportation plan to support waste management activities, including sources of these vehicles and vessels and advance agreements for their use. The transportation plan should include the following considerations, as appropriate:

- a. Types of vehicles to be utilized, categorized by waste type, media (i.e., soil or sediment, water, air), and areas in which they will be operating (e.g., states, tribal areas, ACP Region);
- b. Waste haulers, permits, placarding, and documentation (e.g., EPA or state ID numbers, waste manifests, waste profiles) by vehicle, waste type, and area of operation;
- c. Insurance requirements for vehicles;
- d. Spill response plan for vehicles;
- e. Inter- and intra-state transportation routes;
- f. Inspections; and
- g. Decontamination of vehicles during the response and at the end of the response.

SECTION 4.0 WASTE/MATERIAL TRACKING & REPORTING

The national hazardous waste management framework is based upon a “cradle to grave” system designed to ensure the proper management of hazardous wastes and the protection of public health and the environment. In addition, the IC that is set up in response to a SONS will likely establish tracking and documentation of waste management activities to keep the IC informed of the progress of cleanup and waste management operations. As a result, a waste and material tracking and reporting system can often be an important element of a waste management plan for a SONS.

As previously mentioned, a SONS involves the generation of large volumes of waste, often exceeding what waste management facilities typically handle in the course of an entire year or years of operation. In addition, this waste may be managed over a very large geographic area, involving many state and local governments, as well as a large number of waste management facilities. In order to assure the public, the media, and federal, state, local, and tribal officials that the waste from a SONS is being managed appropriately, it may be important to demonstrate that a waste tracking and reporting system is in place. Accomplishing this goal calls for careful pre-incident planning to identify who is responsible for keeping the tracking system updated with accurate information, establishing data management and data quality control methods to ensure the accuracy of the reporting, and verifying that this system will provide the IC the information necessary to effectively oversee the waste management activities associated with a SONS. A waste and material management tracking and reporting system may include, as feasible:

- a. Reporting of waste sampling and analysis results by location;
- b. Uniform tracking of waste and materials, covering recovered product and liquid and solid wastes;
- c. Tracking the quantity and volume handled at each waste management location, including where waste is temporarily (e.g., staging areas) or permanently (e.g., disposal site, recovery operation) located;
- d. Reporting on the status of waste management activities on a daily and cumulative basis for each type of waste and material;
- e. Cost recovery of waste management activities;

- f. Online web posting showing how and where each category of waste and material is being managed and the quantities accepted at each location; and
- g. Archived posting of the Incident Command System (ICS) reports (e.g., ICS 209, “Oil Spill Incident Status Summary”).

This waste management data may be used to answer information requests from senior governmental officials, the media, and the public. To maximize transparency, the IC may want to provide waste management information to the public as it becomes available. A SONS may involve hundreds of thousands of waste management data points as a result of sampling and site visits conducted on waste management facilities where waste and material were staged, stored, treated, and disposed. Having a system in place to track and report out that information allows for a “cradle to grave” waste management system from points of generation, to staging, storage, treatment, recycling, and disposal. It also allows those involved in the response, as well as waste management officials, the media, and the public, to visualize the waste management process. A typical report produced from this tracking system is included in Table 7, which includes ICS Form 209, “Oil Spill Incident Status Summary.”

Table 7. Example Waste Management Tracking System For an Oil SONS

Staging Areas				Disposal Facilities			
State	WM Staging Area	WM Profile ID	Manifest Date	Manifest ID	Weight Disposed	UOM	WM Disposal Facility
AL	Foley				2.0	Tons	
					0	Tons	
		103663AL - Trash			0	Tons	
	Theodore	105363AL - Crude Cont. Debris			0	Tons	
					2.0	Tons	
FL	Pensacola	103663AL - Trash			0	Tons	
		105363AL - Crude Cont. Debris			2.0	Tons	
			6/2/2010	00063867	2.0	Tons	Chartang
	Pensacola				0	Tons	
		103669FL - Trash			0	Tons	
MS	Pensacola	105363FL - Crude Cont. Debris			0	Tons	
					2.2	Tons	
		103663MS - Trash			2.2	Tons	
	Pecan Grove	105363MS - Crude Cont. Debris	6/2/2010	00063785	2.2	Tons	Pecan Grove
					0	Tons	
	Pecan Grove	103663MS - Trash			0	Tons	
		105363MS - Crude Cont. Debris			0	Tons	
					0	Tons	

Form ICS 209 Cumulative Total to date		UOM
Liquid	0.0	BBLS
Oil	0.0	BBLS
Oily Liquid	0.0	BBLS
Oily Solid	55.6	Tons
Solid	334.3	Tons

Form ICS 209 Definitions	
Oily Solids - Waste Streams sent for disposal at WM landfills containing Oil	
Crude Oil contaminated natural debris (e.g. trees, seaweed)	
Crude Oil contaminated shoreline substrate (e.g. beach sand)	
Crude Oil contaminated industrial type waste (e.g. batteries, tires)	
Crude Oil contaminated spill response equipment	
Solids - Non-Oil contaminated, MSW, Trash, etc. resulting from clean-up efforts	

Notes: Report summarizes the amount of waste disposed on a daily basis

Total weight disposed, by State.
Total weight disposed, by Staging Area.
Total weight disposed, by Waste Type.
Total weight disposed, by Manifest.

Additional information involving a waste and material tracking system for an oil SONS can be accessed at: <http://usresponse.bp.com/go/doc/2911/963567/Waste-and-recoverable-material-tracking>.

Data Management Associated with Waste Management Activities

Data management is an important element of the waste management planning process. The magnitude of this effort is easy to underestimate. A SONS response may involve hundreds of thousands of data points in tracking the entire waste management process. The IC may want to update data regularly throughout the response and also potentially for extended periods beyond that, depending upon the timeframe of the long term recovery plan. This waste management data typically includes data on sampling and analysis; staging and storage; transportation tracking; waste manifests; waste acceptance; chain of custody; treatment and disposal; health and safety; site visits; waste type, designation and categorization; waste shipment logs; and waste weight tickets. The data management plan is often part of the QAPP referred to in Section C. A particular concern for management of waste management data is to define common units of measurement (e.g., tons, cubic yards) in which data will be reported to facilitate timely posting of data from different sources. The suggested content for a data management plan includes:

- a. Description of the data generation, chain of custody, and management process (i.e., from generation to final disposition);
- b. Description of or reference to recordkeeping procedures and document control, data storage, retrieval, and security systems;
- c. Identification of data handling equipment and procedures to process, compile, and analyze data;
- d. Discussion of data handling procedures to detect and correct errors and loss during data processing;
- e. Examples of any forms or checklists to be utilized;
- f. Identification of any specific computer hardware and software performance requirements and how configuration acceptance will be determined;
- g. Description of how data management requirements will be satisfied;
- h. Identification of the names of individuals responsible for data validation, verification, and website posting;
- i. Identification of any protocols for the timeliness of data posting; and
- j. Identification of website formats and reporting formats, as well as frequency of reports and archiving of data.

SECTION 5.0 OVERSIGHT ACTIVITIES & EXIT STRATEGY

A SONS response will likely involve large scale waste management activities that involve many contracts for waste management services. Waste management officials may find that part of their response role is oversight of waste management activities, contractors' performance, and cost accounting associated with these efforts. This may involve oversight of waste management operations conducted either by a responsible party or by federal, state, and local emergency responders. This can be a large effort during a SONS due to the potential for a large number of waste management sites and facilities. As a result, it is recommended that these oversight efforts be planned ahead with a shared responsibility between federal, state, local, and tribal waste management resources. The waste management plan should also include a draw-down or exit strategy for oversight activities.

Waste Management Oversight Activities

During a SONS, waste management officials may be involved in many different types of waste management oversight activities. This section is intended to facilitate planning for waste management oversight activities and approaches. These activities may include:

- a. Review and approval of the responsible party's waste management plans;
- b. Review and approval of the proposed waste management facilities;
- c. Independent sampling and analysis of waste streams;
- d. Site visits or inspections of waste management facilities and sites (e.g., staging, storage, and decontamination sites, landfills); and
- e. Reporting and posting of waste sampling results on an oil spill response website.

These waste management oversight activities generally call for development of plans in support of these activities, taking into account quality assurance and data management considerations, development of forms for the information gathered, and reporting formats to make the information collected publically available.

Waste Management Oversight Exit Strategy/Transition Plan

Since waste management activities associated with a SONS can go on for extended periods of time it is important for the FOSC to also plan an exit strategy for federal waste management oversight. Basically, this is a plan for transitioning from increased oversight associated with the spill back to the routine oversight conducted by state, local, and tribal agencies. The waste management oversight exit strategy should address the oversight activities performed during spill response, who performs them, and the frequency and then the proposed transition of these activities back to their normal routine prior to the SONS. Typically, this involves a transition of all activities back to the state in which these facilities are located. The transition plan should be attached to the overall waste management plan.

SECTION 6.0 COMMUNITY OUTREACH & COMMUNICATIONS

Community outreach and communications associated with waste management activities are a key part of effective waste management operations during a SONS and should be a part of the waste management plan. Community outreach issues related to waste management may include environmental justice concerns, informing the public about waste management operations, establishing processes that allow the public to communicate concerns about waste management operations, and addressing those concerns. While a responsible party may conduct some of this community outreach and communication, federal, state, and local waste management officials can expect to be involved in these activities and should have plans in place ahead of time that address how they intend to meet these waste management related community outreach and communication issues.

Waste Management Community Outreach Activities

The EPA has decades of experience in community relations associated with oil and hazardous waste responses around the country. This experience has shown the importance of community involvement to the overall success of environmental cleanup actions. The same is true for a response to a SONS, with the main differences being that during a SONS the number of people involved is much greater and the demand to respond quickly to requests for information from officials, the media, and the public is tremendous. Having processes and plans in place to handle the magnitude of this effort will enhance the success of a response. A waste management community outreach plan may include the following objectives:

- a. Identify and assess individual community information needs related to waste management operations and respond appropriately with relevant information and actions;

- b. Seek the participation of local elected officials and other community leaders in community outreach efforts related to waste management operations;
- c. Identify stakeholders that should be kept informed and engaged on an ongoing basis during waste management operations;
- d. Develop accurate and timely waste management information to be disseminated to the community in a variety of methods and languages, including print and a publically accessible website;
- e. Identify the appropriate tools and personnel to reach out to key stakeholders; and
- f. Implement appropriate processes to respond in a timely manner to any potential concerns or complaints from the communities affected about waste management operations.

Waste Management Communications

A waste management communications plan should also be developed as part of the waste management plan. Past major oil spills have shown that federal, state, local, and tribal waste management representatives, as well as other agencies, spend thousands of hours in Emergency Operations Centers (EOC), Incident Command Posts, joint field offices, public meetings, and other venues responding to numerous requests for waste management related information. This includes requests from senior leadership throughout federal, state, local, and tribal governments, as well as from Incident Commanders, EOCs, the public, and the media. Due to the magnitude of this effort, a strategy should be developed for communications as early as possible to ensure the proper coordination and flow of timely and accurate waste management information. This involves close coordination and communication between the waste management resources in EOCs; the FOSC in the IC, as well as the Incident Command Planning and Operations Section Chiefs; the Public Information Officer; and, state, local, and tribal waste management officials. A waste management communications plan template should establish these lines of communications and expectations for information in the form of situation reports, media inquiries, and requests for information from Incident Commanders and senior leaders ahead of an event. Communication procedures and processes can be developed, documented, and demonstrated to work during training and exercises to ensure that they will work in a real incident. In addition, frequently asked questions and answers should be included in the waste management plan. Fact sheets that provide information on specific waste types, waste facilities, or waste management operations are another effective communications tool.⁷ It may be useful to have generally anticipated questions and information pre-scripted and coordinated ahead of time and attached to the waste management communications plan template. It should be translated into alternative languages used at the incident location to ensure inclusiveness.

SECTION 7.0 HEALTH & SAFETY CONSIDERATIONS

Health and safety of responders take on an increased importance during waste management operations that are part of a SONS response because of the amount of waste generated and the potential hazards from waste management activities. The health and safety considerations are associated with the use of petroleum related compounds, dispersants, detergents, disinfectants, fumigants, and degreasers; the length of time of the response; the large geographic area; the large number of facilities and equipment utilized; and the number of response personnel (federal, state, and local officials, contractors) involved. In addition, response actions conducted under the NCP⁸ must comply with the provisions of the Occupational Health and Safety Administration's (OSHA's) Hazardous Waste Operations and Emergency Response (HAZWOPER)

⁷ Fact Sheet on Oil Clean-up Waste Disposal, MS Department of Environmental Quality;
[http://www.deq.state.ms.us/mdeq.nsf/pdf/Main_WasteDisposalFactSheet/\\$File/Waste%20Disposal%20Fact%20Sheet%202.pdf?OpenElement](http://www.deq.state.ms.us/mdeq.nsf/pdf/Main_WasteDisposalFactSheet/$File/Waste%20Disposal%20Fact%20Sheet%202.pdf?OpenElement)

⁸40 CFR 300.150.

Standard, under 29 C.F.R. §§ 1910.120 and 1926.65. These health and safety provisions apply even though some of the waste may not be considered hazardous waste under the Resource Conservation and Recovery Act or applicable state law.

OSHA's HAZWOPER regulations require employers to have detailed Health and Safety Plans (HASP) to protect workers involved in cleanup operations in accordance with the NCP. As a result, a waste management HASP needs to be prepared that addresses the potential hazards from handling waste contaminated with oil or by-products of materials utilized in the response to the SONS. The OSHA goals include ensuring that these workers receive appropriate briefings, training, and protective equipment for the potential hazards and exposures that exist during waste management operations. A HASP for waste management operations associated with a SONS response should consider the following items:

- a. Situational overview of the SONS;
- b. Key personnel involved and contact information;
- c. Hazard assessment of all waste management operations and potential exposures;
- d. Training requirements associated with waste management operations;
- e. Personal protective equipment (PPE) requirements associated with each specific waste management operation;
- f. Monitoring and management of temperature extremes;
- g. Medical surveillance requirements;
- h. Exposure monitoring and air sampling;
- i. Site safety control measures;
- j. Decontamination and waste management operations;
- k. Emergency Response/Contingency Plan;
- l. Confined space entry;
- m. Spill containment;
- n. Documentation requirements;
- o. Material Safety Data Sheets for chemicals utilized during waste management operations; and
- p. HASP coordination and approval.

Many resources exist to assist in the development of a HASP for a SONS including resources from the National Institutes of Environmental Health Sciences⁹ and OSHA. OSHA has developed many fact sheets and information applicable to an oil SONS, which is discussed further in the waste management tools and resources section below. Emergency managers, planners, and responders should be aware of the differences between OSHA's and EPA's HAZWOPER Standard as it applies to uncompensated workers and volunteers and ensure those are reflected in the appropriate and applicable waste management HASPs.¹⁰

RECOMMENDED WASTE MANAGEMENT PLAN ATTACHMENTS

The sections above constitute the main elements of a Waste Management Plan. In addition to these, most emergency response plans contain a "toolbox" of information in attachments to the main plan. These attachments often represent key information items that are important enough to have available before an event occurs versus having to develop it during an incident.

⁹ Oil Spill Cleanup Training Tool, NIEHS; <http://tools.niehs.nih.gov/wetp/index.cfm?id=2495>

¹⁰ Training Oil Spill Response Workers under OSHA's HAZWOPER Standard, 2010; <http://www.osha.gov/Publications/3172/3172.html>

The following are useful attachments recommended for a SONS Waste Management Plan. These items have been useful in past major oil spill responses and, if prepared ahead of time, can greatly assist in the response and recovery efforts associated with a SONS:

- Waste Management Facility Assessment Checklist;
- Waste Management Oversight Exit Strategy/Transition Plan;
- Maps & Tables of Approved Oil Reclamation and Waste Management Contractors & Facilities (Contacts, Capabilities/Capacities, Waste Acceptance Criteria, Costs, Pre-approved contracts, etc.);
- Waste Staging/Storage/Decontamination Area Location Maps (Construction Materials, Equipment Needs, Operational & Spill Control Procedures, Site Closeout Checklist);
- Waste Management Documentation/Tracking Forms (Waste Profiles, Manifests, ICS Forms & Reporting Format);
- Waste Management Oversight Reporting & Cost Reimbursement Forms; and
- Individual State Requirements, Emergency Declaration/Orders, etc.

WASTE MANAGEMENT PLANNING TOOLS AND RESOURCES

This section describes some valuable waste management tools and resources that are important to be aware of before a SONS. These tools and resources have been developed to assist emergency managers, planners, and responders, as well as Incident Commanders and waste management officials, during the waste management decision making process involved in a SONS response. Many of these resources and tools have been developed or updated to address gaps in capabilities identified by stakeholders in the emergency response community and are frequently updated. A short description and additional information on each is presented.

Waste management and disposal decisions: U.S. EPA's National Homeland Security Research Center developed the "Incident Waste Assessment System and Tonnage Estimator" (I-WASTE) to assist individuals responsible for making decisions associated with handling, transport, treatment, and disposal of wastes from different incidents. The I-WASTE is location-specific to help identify specific facilities and contacts for disposal. The I-WASTE provides quick reference to technical information, regulations, and other information to provide decision makers with assistance in guiding waste management decisions that are important for the protection of public health, first responders, and the environment. Access to the I-WASTE can be requested through the sign on page at: <http://www2.ergweb.com/bdrtool/login.asp>.

Waste management information: U.S. EPA's Office of Resource Conservation and Recovery maintains the website for "Waste Management from Homeland Security Incidents," found at <http://epa.gov/waste/homeland/>. Homeland security incidents include incidents requiring a national response (e.g., SONS); acts of terrorism perpetrated with, for example, radiological dispersal devices or chemical or biological warfare agents; large-scale natural disasters, such as Hurricane Katrina; and animal disease outbreaks. This site provides waste management information that can be used by emergency managers, planners, and responders in planning before a homeland security incident occurs and in decision-making during and after an incident occurs.

Tracking: DrumTrak is a software tool designed to assist in the process of drum and container management. It captures physical drum data (drum type, closure, layers, location, markings, etc.). In addition, DrumTrak processes analytical results to determine hazardous characteristics and assists users in creating bulk groups for disposal. http://www.ertsupport.org/DrumTrak_Home.htm

Transportation options: U.S. DOT hosts a Hazardous Materials Information Center (HMIC), which can be reached at 1-800-467-4922. The HMIC can provide help on use of the DOT's Hazardous Materials

Regulations 49 CFR Parts 100-185. The specific regulations pertaining to packaging, shipping, and transport of hazardous materials can be found in 49 CFR Parts 171-180. <http://www.phmsa.dot.gov/hazmat/info-center>

Hazardous waste treatment, storage, and disposal facilities regulations: This web-based document serves as a user-friendly reference in locating and understanding the current RCRA hazardous waste treatment, storage, and disposal facility (TSDF) regulations. The information is organized by the type of hazardous waste management activity, which encompasses hazardous waste treatment, storage, and disposal, and includes information on containers, incinerators, landfills, land treatment, surface impoundments, tank systems, and waste piles. This reference can be an important resource in developing a waste management plan for hazardous waste streams. A copy of this document can be found at: <http://www.epa.gov/epawaste/hazard/tsd/permit/tsd-regs/tsdf-ref-doc.pdf>.

Public health emergencies: The Centers for Disease Control and Prevention has a website on Emergency Preparedness and Response. This website is a source of information and resources for preparing for and responding to public health emergencies. This site keeps the public informed about public health emergencies and provides vital information on those emergencies. This site is located at: <http://www.bt.cdc.gov/>. The Agency for Toxic Substances and Disease Registry (ATSDR) is another federal public health agency of the U.S. Department of Health and Human Services. ATSDR serves the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. Their website also has valuable information on emergency response and is located at: <http://www.atsdr.cdc.gov/>.

Emergency preparedness and response: The OSHA Emergency Preparedness and Response website highlights OSHA standards, preambles to final rules, directives (instructions for compliance officers), official letters of interpretation of the standards, other documents, and other federal standards related to emergency preparedness and response. This site is located at: <http://www.osha.gov/SLTC/emergencypreparedness/>.

Oil spill response: The Oil Spill Solutions site provides a large quantity of useful information on the subject of oil spill responses. The developer of the website has responded to some of the world's largest oil spills for over 30 years, covering spills from oil tankers, offshore platforms, and pipelines onshore and offshore. The site is located at: <http://oilspillsolutions.org/>.

Oil spill response: IPIECA is the global oil and gas industry association for environmental and social issues. The IPIECA has many publications dealing with waste management, contingency planning, as well as health and safety associated with oil spill response. The site is located at: <http://www.ipieca.org/>.

Technical advice: The International Tanker Owners Pollution Federation (ITOPF) provides technical advice and information on all aspects of pollution response and the effects of spills on the marine environment. Their technical services include on-site cleanup advice, pollution damage assessment, assistance in spill response planning, and the provision of training and information. ITOPF has many technical publications, including information on spills involving oil and chemicals. The site is located at: <http://www.itopf.com/>.

SUMMARY

Experience in responding to major oil spills (e.g., Deepwater Horizon Oil Spill) as well as major natural and man-made incidents (e.g., anthrax letters, Hurricane Katrina, Japanese tsunami and nuclear power plant incident) over the past decade has continued to show the importance of pre-incident waste management planning as a measure of being prepared to respond to major incidents like a SONS. These experiences have shown that many waste management planning elements are similar regardless of the type of incident and can be planned for ahead of time and then tailored to the site-specific incident. The common elements that drive the need for planning include: larger quantities of waste, wider area of impact, the need for community engagement, and the reality that large scale incidents quickly draw greater public scrutiny, as well as national and international media attention.

Waste management planning is a dynamic process and involves a great deal of complexity and integration of people, processes, and systems. This framework for a model waste management plan for a SONS is intended to build upon the lessons learned from major incidents in the past and to identify those planning elements needed to improve waste management preparedness for major incidents in the future. Even though SONS may not occur frequently, the elements of this planning process can assist a community in being prepared for other major natural and man-made incidents that involve the same waste management planning elements. Effective pre-incident waste management planning can lead to a more timely and cost effective response to and recovery from major incidents such as SONS.

EPA hopes to continue to improve upon waste management planning for incidents like a SONS. As a result, we are interested in your feedback so that we can continue to improve upon this framework, as well as develop other waste management tools and resources. To contact us, the U.S. EPA's Office of Resource Conservation and Recovery maintains the website for "Waste Management from Homeland Security Incidents," found at <http://epa.gov/waste/homeland/>. Comments can be submitted to us directly through that website or alternatively to Mr. Mario Ierardi, (703) 308-8894, at EPA's Office of Resource Conservation and Recovery.