All-hazards Waste Management Decision Diagram

Background: Waste management (also referred to as debris management) is a critical part of the response to and recovery from a homeland security incident, such as an act of terrorism involving chemical, biological, or radiological agents, a large-scale natural disaster, and an animal disease outbreak. Waste is generated immediately by the incident itself and continues to be generated by the characterization, decontamination, and cleanup processes. More efficient and effective management of the amounts and types of waste generated can result in a quicker and less costly recovery from an incident.

Purpose: This waste management decision diagram is intended to assist emergency planners and managers in the public and private sectors with the waste management decision-making process after a homeland security incident occurs. It includes considerations that aid in making waste management-related decisions and identifies areas where pre-incident waste management planning can be useful.

Notes about this Decision Diagram:

- This decision diagram is divided into three stages – initial activities, on-site activities, and off-site activities – at which waste management decisions are typically made during an incident. The diagram is intended to be a guide only. While many of these considerations and decisions are part of every response, differences in the waste management decision-making process exist but are not accounted for in this all-hazards decision diagram. Also, many of the steps may occur concurrently during an incident, as well as in a different order. The needs and specifics of the response should guide the decision-making process.

- Planning for waste management, including waste staging, sampling, characterization, packaging, transportation, reuse, recycling, treatment, and disposal, before an incident occurs is very important. Pre-incident planning facilitates the decision-making process during an incident response, assisting with the steps in this flowchart. More information about pre-incident planning can be found in EPA's *Pre-incident All-hazards Waste Management Plan Guidelines: Four-step Waste Management Planning Process* document, which can be found at https://www.epa.gov/homeland-security-waste.

- This diagram does not discuss the Federal Emergency Management Agency's (FEMA's) *Public Assistance Program and Policy Guide*. Review FEMA's eligibility requirements at https://www.fema.gov/media-library/assets/documents/111781 in the event of a federal emergency or major disaster declaration.

- Different waste management requirements may apply to different types of wastes. For example, solid waste that is non-hazardous under the Resource Conservation and Recovery Act (RCRA) would likely take a different route than RCRA hazardous waste, as well as from waste that falls outside RCRA's scope. Alternatively, all waste may be managed under the more stringent requirements for hazardous waste. In addition, states may have more stringent requirements for waste than the federal regulations.

- Reuse and recycling opportunities are potentially available for many different waste streams, including hazardous waste. Legitimate reuse and recycling options, if applicable, should be considered before other waste management options (e.g., landfills) to help lessen the environmental and economic impacts of the incident. Hazardous waste being legitimately recycled still needs to meet the RCRA hazardous waste management requirements, unless specifically excluded from regulation.

All-hazards Waste Management Decision Diagram for Homeland Security Incidents

Initial Activities

Conduct Damage Assessment
- What is the nature of the incident?
- Select Waste Management Plan that aligns to the specific incident, if applicable
- Establish and maintain communication across the whole community (e.g., regulatory agencies, general public)
- Investigation by law enforcement may impact initial waste management activities

→

Identify Generated Materials[1] and Estimate Their Quantities
- Begin identifying potential waste management sites, facilities, and resources if not already pre-identified
- Conduct cost-benefit analysis of waste management options

→

Segregate the Materials as Much as Practicable
- Separate materials that have the potential for reuse or recycling from materials that will be otherwise managed
- May also segregate the materials by type, potential waste stream, receiving facility, contaminant, or required treatment technology

→

Will Materials Be Decontaminated?

Yes →

Decontaminate the Materials with Appropriate Assistance
- Prepare a site sampling and analysis plan
- Establish a clearance level
- Confirm effectiveness of decontamination technology
- Manage waste (e.g., decontamination water generated from the decontamination process)

No →

On-site Activities

Make Waste Determination
- Are materials reusable?
- Develop or update waste sampling and analysis strategy for waste characterization and classification
- How does RCRA status (hazardous vs. non-hazardous) impact storage, documentation, handling, safety, and other considerations?
- How do other EPA statutes and statutes from other federal agencies (e.g., CDC, NRC, USDA) apply?
- How do state/local/tribal/territorial regulations apply to the waste (which may be more stringent than federal requirements)?

Reusable Materials →

Reuse
- Vendor verification suggested

Waste →

Process Waste if Applicable or Feasible
- Consider treatment options
- Waste minimization (e.g., volume reduction, toxicity reduction)
- Biosecurity, chemical agent, and particulate concerns
- Conduct environmental monitoring

→

Will the Waste Be Recycled or Composted Off-site[2]?

No →

Can the Waste Be Disposed of On-site?

Yes →

Dispose of Waste in a Manner that Protects Human Health and the Environment
- Environmental monitoring/controls

Yes →

Prepare Waste for Transport[3]
- Packaging, labeling, and transport requirements (e.g., EPA, DOT, state)
- Other federal/state/local/tribal/territorial regulations may apply
- Any special handling/safety considerations?

Non-recyclable Waste →

Select Appropriate Disposal Facility
- Capacity, cost, permit considerations
- Community concerns and Environmental Justice issues considered?
- Coordinate with stakeholders

→

Can Waste Be Directly Transported to the Facility?

No →

Manage Waste in a Storage/Staging Area
- Segregate the waste
- Remove hazards
- Decontaminate as necessary
- Conduct environmental monitoring
- Volume reduction
- Can be on-site or off-site
- Comply with applicable regulations

Yes →

Recyclable Waste →

Off-site Activities

Recycle
- Vendor verification suggested

Manage Waste in an Appropriate Disposal Facility

[1] "Material" is defined broadly at this point in the process: materials ultimately may be reused, recycled, or disposed of as waste.

[2] In some circumstances, waste can be recycled (e.g., breaking up and grinding concrete on-site for immediate use in backfill) or composted (e.g., in-house composting of poultry) on-site.

[3] Waste identified as hazardous would need to meet the RCRA hazardous waste management requirements for transportation, recycling, storage, treatment, disposal, etc.

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