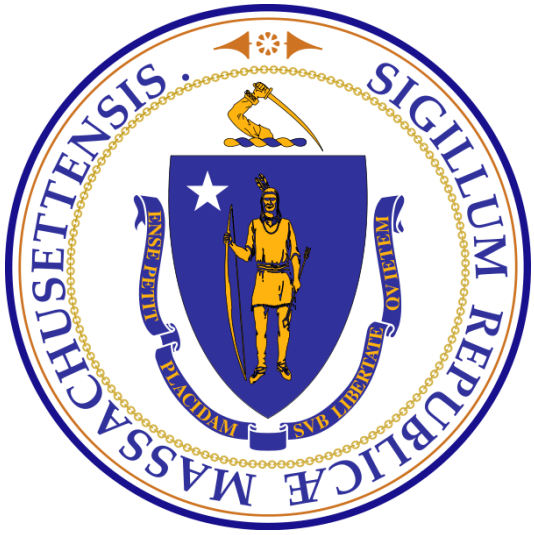
# COMMONWEALTH OF MASSACHUSETTS




# State Debris Management Plan

## August 2022

Final Version August 2022

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# 1.0 Introduction

The State Disaster Debris Management Plan (hereinafter referred to as "the Plan") is an annex to the Massachusetts Comprehensive Emergency Management Plan (CEMP). The Plan describes an organizational framework designed to rapidly and safely separate, remove, collect, recycle and dispose of disaster-related debris; and minimize debris-related threats to public health and safety and to the environment.

Implementation of the Plan will be coordinated by the Massachusetts Emergency Management Agency (MEMA), utilizing state agencies and organizations working in Emergency Support Functions (ESFs), and contracted vendors. In addition, the Plan offers guidance to local communities to better manage disaster debris in conjunction with state efforts.

The Plan anticipates and considers debris management needs that may result from any type of disaster that could create extensive debris management challenges that may temporarily overwhelm existing solid waste, recycling, and composting programs.

## 1.1 Purpose

The purpose of this Plan is to support those communities or regions unable to adequately manage disaster-related debris. The Plan addresses all types of debris-generating events, from debris impacting a single community, to statewide catastrophic events.

The Plan goals are:

1. To provide a framework for the Commonwealth of Massachusetts to respond and recover from a debris-generating event.
2. To utilize a tiered response approach that outlines state actions when municipalities are overwhelmed, and state assistance is needed.
3. To provide debris management guidance to municipalities before, during, and following a debris event.

## 1.2 Scope

The Plan is intended for local governments, tribal, state, federal and non-governmental agencies involved in debris management operations impacting the Commonwealth.

The Plan also emphasizes the need to safely manage different types of debris, including infectious waste and hazardous materials, in a manner that will protect public health and the environment, while enabling communities to return to pre-disaster conditions as quickly as possible.

## 1.3 Authority

MEMA is responsible for coordinating all aspects of disaster and emergency management as outlined in the Massachusetts Civil Defense Act, Chapter 639 of the Acts of 1950, Codified, Appendix 33. Additionally, Massachusetts Executive Order 144, September 27, 1978 directs State agencies to provide personnel and resources at MEMA's volition to enhance coordinated response.

The Massachusetts Department of Environmental Protection (MassDEP) is responsible for determining necessary waste disposal capacity as set out in the Solid Waste Act of 1987, M.G.L. Chapter 16, Section 21. MassDEP's Solid Waste Master Plan provides a hierarchy of waste management alternatives that maximize recycling and minimize disposal of waste and ensure that waste that does

need to be disposed is safely managed to protect the public health, safety and the environment and reduce pressure on limited in-state disposal capacity. Following a major disaster, emphasis will be placed on recycling, composting, and otherwise diverting debris from disposal to the greatest extent possible.

### 1.4 Policies

The State's policy, as it relates to debris clearance, following a State Emergency Declaration is as follows:

- State resources may be utilized to perform temporary repairs and/or clear debris from impacted roadway surfaces and other public property when local resources have been depleted.
- Permanent repairs and/or removal of the cleared debris, and ultimate storage and/or disposal, are the responsibility of the affected governmental entity. (Clearance means that roads/lanes are passable for emergency vehicles; debris may be in the highway right-of-way. Removal means that debris is removed from the highway right-of-way and properly disposed.)
- State missions shall be assigned on a prioritized basis, according to the following order of priorities:
    1. To re-open transportation corridors to enable the passage of emergency vehicles.
    2. To re-open transportation corridors and other property to allow utility crews access to facilitate repairs of the utility infrastructure and restore power.

Regarding public messaging, messages disseminated by the Commonwealth will be equally accessible to and effective for individuals with disabilities and those who have limited English proficiency. All agencies and organizations with roles and responsibilities for public messaging must ensure their messaging and systems also ensure equal access and effective communications for these populations as well.

## 2.0 Situation and Planning Assumptions

### 2.1 Situation

Massachusetts has identified and prioritized hazards that can affect the state via the Hazard Identification and Risk Assessment (HIRA), and Threat Hazard Identification and Risk Analysis (THIRA) process. These hazards are included and addressed in the Massachusetts CEMP.

Massachusetts has experienced various disasters throughout the years that have generated quantities of debris that have exceeded local capability, resulting in requests from municipalities to the state for assistance. Guidance on estimating debris amounts, a description of the types of hazards that could generate large amounts of debris, and the types of debris that would typically be generated by each, can be found in the appendices section of this Plan.

### 2.2 Planning Assumptions

- A large-scale disaster may overwhelm a local community’s ability to remove and manage debris.
- Initial debris removal operations will focus on the clearance of roads for emergency responders and lifesaving activities.
- Disasters can generate different types and combinations of debris which may present a challenge in removing and managing that debris.

- Regular waste management approaches may be inadequate following a disaster which generates large amounts of debris.
- Hazardous material and environmental issues will have to be addressed throughout the debris management operation.

# 3.0 Debris Management Phases

## 3.1 Debris Clearance

During the first 24 to 72 hours after the disaster, debris activities include clearing roads for emergency access by pushing debris to the edge of the right-of-way, rather than restoring roads to pre-event conditions. This phase is generally concurrent with the response phase. In general, this phase will be managed and directed by the local Emergency Management Director (EMD) or Incident Commander (IC), and supported by local or locally contracted resources, mutual aid, and other resources.

## 3.2 Debris Removal and Recovery

Debris removal operations are defined as the “cradle to grave” activities to collect eligible disaster related debris from the public right of way (ROW) and facilities and transport the debris to a temporary or permanent disposal site. Other activities associated with recovery operations may include sorting the construction and demolition (C&D) related materials, processing vegetative debris, recycling materials, as practicable, and the segregation of hazardous and special waste materials.

Debris removal operations typically begin within a few days following a major debris generating event and can take weeks or months to complete.

## 3.3 Debris Monitoring

When a disaster event occurs that produces large amounts of debris, coordination between local and state agencies will be required to ensure that debris removal operations are efficient, effective, and eligible for Federal Emergency Management Agency (FEMA) Public Assistance grant funding. In addition, monitoring debris removal operations will require comprehensive observation and documentation of debris removal work performed from the point of debris collection to final disposal.

# 4.0 Concept of Operations

## 4.1 Request for Assistance

In the event a local community requires state assistance, a request for assistance will be directed to the appropriate MEMA regional office or Regional Emergency Operations Center (REOC). Once received, the request will be assessed by MEMA’s regional staff. If the request can be fulfilled at the regional level, the responding MEMA regional office or REOC will manage it. If the request cannot be fulfilled at the regional level, it will be submitted to MEMA Headquarters or the State Emergency Operations Center (if the SEOC is activated) for further review and determination.

## 4.2 Plan Activation

The Plan may be activated when the MEMA Director, the State Emergency Operations Center (SEOC) Manager, or their designee determines that at one of the following triggers has been met:

- A municipality has exceeded its capacity to clear and remove debris and has requested state assistance.
- A major disaster is imminent (e.g., hurricane) and the need for state debris clearance and removal assistance is likely.
- The SEOC is activated and clearing and removing disaster debris from an impacted area(s) is identified as an incident objective.

### 4.3 Notification

Once the MEMA Director or SEOC Manager has made the decision to activate the Plan, MEMA will notify the point of contact (POC) for the agencies and organizations that have operational roles and responsibilities under the Plan. Depending on the operational needs of the incident, a representative from those agencies and organizations may be requested to support the SEOC.

In the event a vendor contract for debris clearance and removal is needed MEMA will contact the vendor(s) on state contract and advise them of MEMA's intent to activate the contract(s). The vendor(s) will begin coordination and mobilization immediately following notification per the contract terms and conditions; this may include the deployment of essential vendor staff to the SEOC.

### 4.4 Notice Events

For a notice event (e.g., a hurricane) which has the potential to generate a significant amount of debris, MEMA may activate the Plan, and convene agencies and organizations with roles and responsibilities under this Plan to begin the process of planning for a debris event. Debris management preparation activities may include but are not limited to:

- Identifying the hazard and potential impacts.
- Identifying available state resources and any resource gaps.
- Verifying state contracts and confirming availability for stand-by or activation.
- Identifying state Debris Management Sites (DMS).
- Coordinating the deployment of personnel and pre-positioning equipment.
- Confirming the specific data needed to be collected from municipalities.
- Contacting local communities to determine if debris management support will be needed.

In addition, pre-event debris management guidance to local communities will be coordinated and facilitated by MEMA's Recovery Unit. Support may include meeting with local officials to provide information on reimbursement, reviewing reimbursement requirements, and managing local expectations.

### 4.5 Direction and Control

Once the Plan is activated, the Massachusetts Department of Environmental Protection (MassDEP) will serve as the lead coordinating agency for all state debris clearance and removal activities. MEMA will support MassDEP to ensure that all state disaster debris management activities are carried out. In general, state debris management activities will include:

- Coordination of resources.
- Ongoing communication with impacted communities, debris management vendors, and all other agencies and organizations acting in support of the Plan.
- Maintaining situational awareness.

As needed, MEMA will engage partners at the state, local, and non-governmental levels to support the operation. If the SEOC is activated, a Debris Management Group may be stood up within the Operations Section to oversee and coordinate debris management response activities.

## 4.6 Organization

In the event the SEOC is activated, a Debris Management Group may be stood up under the Operations Section. In general, the Debris Management Group will have a direct report to either the Operations Section Chief, or the Deputy Operations Section Chief for ESFs. In the event the SEOC Operations Support Branch is activated, a Debris Management Group may be stood under this Branch with a direct report to the Branch Director. See Figure 1 and 2 below for how the Debris Management Group may be organized within the SEOC.

**Figure 1: Option A- SEOC Debris Management Group**

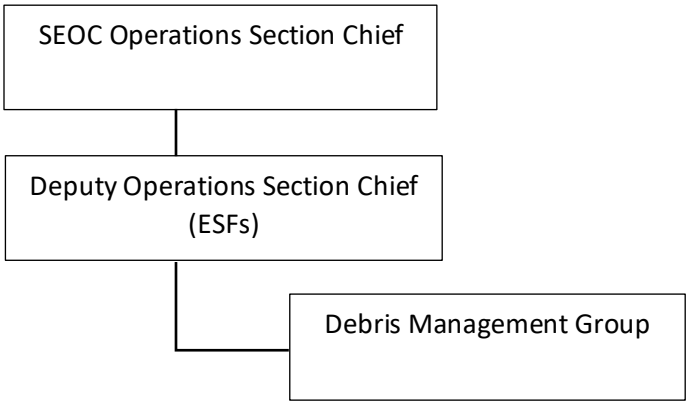
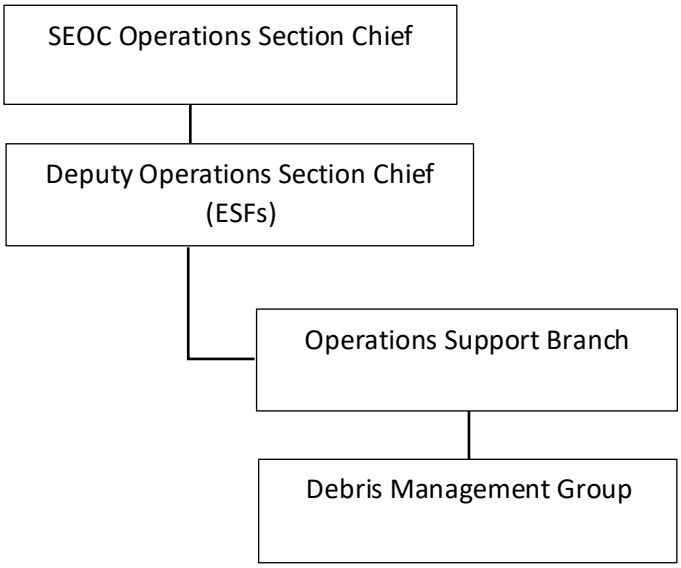



**Figure 2: Option B- SEOC Debris Management Group**



### 4.6.1 Debris Management Group

The Debris Management Group will be led by MassDEP and may include, but is not limited to, representatives from the following agencies and organizations:

- MEMA
- Massachusetts Department of Agriculture (DAR)
- Massachusetts Division of Capital Asset Management and Maintenance (DCAMM)
- Massachusetts Department of Conservation and Recreation (DCR)
- Massachusetts Department of Transportation (DOT)
- Massachusetts Department of Public Utilities (DPU)

If activated, the Debris Management Group will be responsible for the following activities:

- Provide input on policy and decision making to the SEOC, as it relates to the overall debris operations.
- As needed, liaison with FEMA Public Assistance staff.
- As needed, participate in the preliminary damage assessments.
- Provide information related to statewide debris activities.
- Provide assistance to estimate debris quantities.
- Monitor debris-specific resource requests and track available resources.
- Coordinate with impacted communities to gather information on the status of debris clearance activities and any support needed.
- Monitor contracted-mission costs to ensure they remain in scope and budget and/or that contracts and budgets are adjusted to meet changing needs.
- If a state DMS is needed, coordinate with DCAMM to select, assess, and secure a state property.
- Coordinate with the SEOC Public Information Officer (PIO) to provide information for Massachusetts residents and businesses on debris removal activities impacting the state roadways, parks, and facilities.

## 4.7 Damage Assessments

Following an event, state agencies will conduct Rapid Impact Assessments (RIAs) which is typically performed by means of a street-by-street survey. Each agency will deploy its own assessment teams and visually estimate the quantity of debris on roadways, public and private property. Ineligible debris is not included in the estimate. Ineligible debris includes debris such as white goods previously designated for disposal, residential and commercial demolition materials not generated by the disaster event, and items such as old tires.

The Initial Damage Assessment (IDA) process begins when conditions are considered safe enough for personnel and equipment to travel. As it relates to debris, IDAs are used to determine the location and extent of damages, an estimate of the types and quantities of debris, and an estimate on the cost to remove the debris from public property and rights-of-way. In addition, IDAs are used to prioritize the impacted areas and the resources available. For more information, refer to the Massachusetts Damage Assessment Plan.

## 4.8 Disaster Debris Tiers

Disaster Debris Tiers have been established to identify and categorize the scope and severity of a debris event. The information gathered from local officials and RIAs will help determine which Disaster

Debris Tier will be applicable for the event. The Disaster Debris Tier Table below should be used to determine the scope and scale of a debris event and what resources should be used to respond. Because every disaster event is different, the Disaster Debris Tiers are flexible in terms of the resources that can be used to respond to a debris event, and the level of government assistance that may be required to support debris clearance and removal activities.

**Table 1: Disaster Debris Tiers**

| | Tier 1 | Tier 2 | Tier 3 | Tier 4 |
|---|---|---|---|---|
| **Impacts** | Local Event, Single Community | Local Event, Request State Assistance | Regional Event, Multiple Communities | Statewide |
| **Resources** | Local resources and vendors | Local resources, vendors, and mutual aid | State mutual aid and state contracts activated | State contracts activated |
| **Organization** | Local government departments | MEMA Regional Offices with MEMA Operations Unit | SEOC Partial Activation | SEOC Full Activation |

## 4.9 Debris Management Actions

This section of the Plan expands on Section 3.0 which outlines the phases of a debris event. As needed, the following actions will be carried out by the agencies and organizations with operational roles and responsibilities under this Plan.

### 4.9.1 Debris Clearance Actions

State resource priorities will be focused on interstate highways, state routes and roads. During the debris clearance phase, there is no attempt to physically remove or dispose of the debris from the roadway, only to clear key access routes to facilitate public safety, emergency access and egress, restoration of essential services/utilities, and damage assessment. Debris clearance actions include:

- Prioritization of critical route clearance for:
    - Interstate highways
    - State and US routes/roads
    - Other municipal roadways
    - Emergency access to hospitals and other identified key critical infrastructure

- Clearing emergency access routes:
    - Clearance should be performed 24 hours/day until access opened
    - Assets committed will depend on the nature of event
    - To the extent possible, clear curb cuts, fire hydrants, valves, and catch basins

  *State resources will be withdrawn after roads are cleared for emergency access and/or before local resources are withdrawn.*

- Coordinating with utility companies to:
    - Ensure “cut and clear” operations are being performed until downed lines are de-energized

- Check for generators operating in area that could energize street lines
- Confirm status of impacted facilities (i.e., power lines, gas lines, etc.)

### 4.9.2 Debris Removal Actions

The following activities should occur during the Debris Removal phase:

- Document all actions and costs (continue work documentation and monitoring through all debris management activities).
- Update and revise damage assessments as needed.
- Divide the disaster area into manageable clean-up zones.
- Monitor debris removal activities.
- If necessary, activate state contracts for debris removal and monitoring.
- Support local officials in informing the public of debris clean-up schedules, separations, and other major aspects of the operation.
- Properly close debris management sites and return to pre-disaster conditions.

To ensure that debris removal is completed adequately, MEMA, in coordination with an inter-agency procurement team, established a statewide contract, PSE03, for disaster debris removal services and for operation of temporary debris management sites that may be accessed by all municipalities. In addition, the contract includes requirements for vendors to assist contracting entities with recordkeeping and tracking systems to efficiently track debris removal work and expenses.

i. Private Property

Debris removal on private property is the responsibility of the individual property owner which may be aided by insurance settlements and other forms of assistance. In limited circumstances, based on the severity of the impact of an incident and whether debris on private property is so widespread that it threatens public health and safety or the economic recovery of the community, FEMA may determine that private property debris removal (PPDR) is eligible under the Public Assistance Program (PA). FEMA requires a written request that demonstrates legal authorities and indemnification or immediate threat to the public.

### 4.9.3 Debris Monitoring Actions

The following activities should occur during the Debris Monitoring phase:

- Liaise with FEMA on applicant eligibility
- Provide guidance to local officials on monitoring debris removal operations and documenting eligible quantities and reasonable expenses, in accordance with the FEMA Public Assistance Debris Monitoring Guide. This includes constant crew oversight, truck measurements, load ticket preparation and issuing, and documenting that crews are performing work.

To ensure that debris monitoring is completed adequately, MEMA worked with an inter-agency procurement team to establish a statewide contract, PSE02, for disaster debris monitoring and management services that may be accessed by all municipalities. The contract includes requirements for vendors to assist contracting entities with recordkeeping and tracking systems to efficiently track debris amounts and expenses.

### 4.10 State Debris Sites

DCAMM manages state properties that may be utilized as state debris sites. DCAMM maintains a list of state properties, including some that meet MassDEP's debris management site criteria. DCAMM updates its list of state properties annually.

In the event a state debris site(s) is needed, the SEOC Debris Management Group will use the State-Owned Debris Management Site Standard Operating Procedure (SOP), found in Appendix A, to identify and select a site. Additional guidance on debris site requirements, operations, and closures can be found in Appendix B.

### 4.11 Demobilization

As state debris operations conclude, MEMA and ESF personnel will be released from the SEOC when they are no longer needed to support debris clearance and removal efforts. The SEOC Operations Section will continue to track deployed resources and ensure any ongoing issues are resolved. The MEMA Recovery Unit will continue to provide reimbursement guidance to local and state agencies throughout the recovery phase as needed.

i. State Debris Contracts
   Upon completion of assigned tasks, the contract vendor is responsible for closing out all related operations, including but not limited to, removing equipment, closing out any Debris Management Sites, and restoring any property used by the vendor to its original condition prior to the disaster event.

## 5.0 Roles and Responsibilities

### 5.1 Local

Local government is responsible for debris management throughout the lifecycle of the event, to include collecting debris and establishing debris management sites during the ongoing response and recovery phases. Municipal personnel, equipment and resources may be augmented by contractors, volunteers, and mutual aid from neighboring communities. Local resources should be fully utilized before state resources are requested.

In addition, impacted municipalities will be responsible for regularly assessing and monitoring the condition of all roads to determine priority for possible deployment of available state resources. Roads will be assessed according to the following rating system:

1. Impassable
2. Passable, but right-of-way not usable (shoulder, large debris piles etc.)
3. Normal/ "clean" (pre-disaster condition)

### 5.2 State

#### 5.2.1 Massachusetts Department of Environmental Protection (MassDEP)

MassDEP is assigned under this Plan as the lead state agency for debris management operations. Below are MassDEP's primary roles and responsibilities:

- Lead the debris cleanup operation for hazardous waste sites.
- Commit available MassDEP resources in support of response efforts.
- Provide guidance to DCAMM when updating list of state-owned property to be used for state debris management sites.

- Coordinate with MEMA's Recovery Unit to provide guidance to municipalities on debris clearance, management, and removal.
- Ensure compliance with Massachusetts laws, regulations, and executive orders from local government requesting debris management sites.

### 5.2.2 Massachusetts Emergency Management Agency (MEMA)

- Activate Disaster Debris Management Plan as needed.
- Process resource requests from municipalities needing assistance for debris clearance and removal.
- Assist local municipalities in identifying potential contractors and/or provide contracting assistance and guidance.
- Support debris operations through activities related to payroll, contract procurement, cost tracking, retention of all invoices and records related to the debris operations, and invoice reconciliation.
- Maintain statewide debris monitoring and management contracts with vendors.
- Conduct statewide coordination calls for situational awareness.
- Provide guidance to municipalities on debris clearance, sites, management, and removal.
- Develop and disseminate public information messages related to the Commonwealth's debris management operations.

### 5.2.3 Department of Conservation and Recreation (DCR)

- Ensure all DCR operated regional parks, roadways, and recreational systems in the Boston metropolitan area, state forests, watershed areas at the Quabbin and Wachusett Reservoirs are cleared of debris following an event.
- Commit available resources to support response efforts, including utilizing equipment and personnel to assist in removing debris from the public right-of-way.

### 5.2.4 Division of Capital Asset Management and Maintenance (DCAMM)

- Coordinate with the SEOC to provide available state-owned properties that could be used for state debris management sites.
- Maintain, share and update (at least annually), a vetted list of state-owned property that could be used as state debris management sites.

### 5.2.5 Massachusetts Department of Agriculture (DAR)

- Coordinate with MassDEP and the Department of Fish and Wildlife (DFW) on the safe disposal of dead animals/ animal carcasses following a debris event.

### 5.2.6 Massachusetts Department of Transportation (MassDOT)

- Clear debris from agency buildings and maintain state owned and operated highways, roads, and bridges.
- Coordinate with MBTA and MassPort to ensure debris is cleared and removed for the following services:
    - Bus
    - Trolley, to include trackless trolleys
    - Rapid transit
    - Aviation (e.g., Logan International Airport)

- Maritime (in the Port of Boston)

### 5.2.7 Massachusetts Department of Public Health (DPH)

- Coordinate with MassDEP on the safe disposal of infectious wastes following a debris event.

### 5.2.8 Massachusetts Port Authority (MassPort)

- Clear debris from, and maintain commercial aviation facilities at Logan International Airport, Hanscom Airfield, maritime facilities in the Port of Boston, and the Tobin Bridge.

### 5.2.9 Massachusetts Bay Transportation Authority (MBTA)

- Coordinate debris management activities for all its services to included, buses, trackless trolleys, and rapid transit.

### 5.2.10 Massachusetts Department of Public Utilities (DPU)

- Coordinate with electric utilities providing debris clearance to restore power to communities and critical facilities.
- Coordinate with the SEOC on the status of impacted facilities and services (i.e., power lines, gas lines, etc.).

### 5.2.11 Massachusetts Department of Fish and Wildlife (DFW)

- Coordinate with MassDEP and DAR on the safe disposal of dead animals/ animal carcasses following a debris event.

### 5.2.12 Massachusetts National Guard (MANG)

- Commit available resources to support response efforts, including utilizing equipment and personnel to assist in removing debris.
- Commit available resources to support Logistics Support Areas, including utilizing equipment and personnel to assist with operations of these areas.

## 5.3 Federal

As needed, the Commonwealth of Massachusetts works in coordination with federal agencies in the execution of the debris management process following a disaster. The federal agencies that may participate in a disaster debris generating event are described below along with a summary of the types of assistance each agency may provide. This assistance ranges from technical assistance, debris removal assistance or grant monies to aid the state, and its municipalities to achieve a full recovery. Coordination with all federal agencies would occur between MEMA and the impacted municipal government.

### 5.3.1 Federal Emergency Management Agency (FEMA)

The Robert T. Stafford Disaster Relief and Emergency Assistance Act authorizes FEMA to provide assistance to eligible applicants, following a Federally Declared Disaster. FEMA provides reimbursement for eligible expenditures that a government entity incurs for debris removal activities which protects the public health and safety, eliminates the immediate threats of significant damage to improved public or private property, and that ensures the economic recovery of the affected community at large. FEMA establishes policy and guidance on debris removal eligibility and required

documentation for the reimbursement process. FEMA may also provide direct assistance to the state through a mission assignment to another federal agency, when requested by the state.

#### 5.3.2 United State Coast Guard (USCG)

USCG may provide federal coordination for the removal of oil and hazardous materials within the coastal zone of the state. The USCG is also responsible through the Ports and Waterways Safety Act (33 U.S.C §1221) to keep waterways safe and open.

#### 5.3.3 United State Army Corps of Engineers (USACE)

The USACE, if tasked through a federal mission assignment, may provide all debris removal operations in a devastated area. The USACE will coordinate with the state or municipal government to determine the priority needs of the state. The federal government may also authorize the USACE to remove debris from publicly maintained commercial harbors, as well as removal of obstructions in navigable waterways in emergency situations. The USACE is also a permitting agency for work (dredging) conducted in the navigable waterways. The USACE can provide technical assistance on the debris operations, as requested by the state.

#### 5.3.4 Environmental Protection Agency (EPA)

The EPA may provide technical assistance and debris removal related to oil contaminated debris or debris consisting of hazardous substances. Whereas the USCG has authority for coastal zones, the EPA's authority is related to inland zones. Coordination occurs between the federal government and MassDEP.

### 5.4 Other Agencies and Organizations

Depending on the needs of the mission, other agencies and organizations may be called upon to support debris management preparation activities and/or operations. Those agencies and organizations may include but are not limited to:

#### 5.4.1 Massachusetts Highway Association

As needed, coordinate with the SEOC Debris Management Group to confirm resources are available from other municipalities via intrastate mutual aid programs for a debris event.

#### 5.4.2 Massachusetts Voluntary Organizations Active in Disasters (MAVOAD)

Volunteer agencies may provide an additional layer of support in the state's recovery from a declared disaster. Specific to debris, these volunteer groups may assist private property owners that do not have the means to recover from the disaster impacts. Volunteer services may include debris removal and demolition. Volunteer groups work with the State Volunteer Liaison or municipalities to coordinate these recovery efforts.

## 6.0 Communication

The SEOC Public Information Officer (PIO) will lead the coordination of public information and messaging about the Commonwealth's debris management operations. The SEOC PIO, the SEOC Recovery Section, Mass DEP, and relevant representatives from the impacted communities will work collaboratively to craft accurate, accessible, and consistent messages to the general public. The type of information that will be communicated will relate to debris operations, including information on resident health and safety, environmental considerations, and debris segregation and set-out roadside

procedures. Depending on the recovery and debris operations, impacted communities may have varying plans and processes for their residents to follow therefore, the messages may need to be tailored by community. Various public information outreach methods will be used to disseminate the information to reach as many people as possible, particularly given any communications systems disruptions from the emergency. These methods may include, but are not limited to:

- Press releases to media
- Social media
- Website content
- Public forums
- Direct mail / direct distribution
- Billboards
- Local community resources
- Notification systems
- Collaboration with other partners and local organizations

At a minimum, the messaging will address the following:

- How debris will be collected (i.e., curbside and/or collection centers)
- Specifics regarding dates, hours, locations, routes, etc. for drop off, allowable types and quantities of debris
- Segregation requirements for debris
- Household hazardous waste considerations
- Location of the local debris management facilities that will be used
- Contact information for any additional questions and concerns

## 7.0 Contracts

Managing a large quantity of debris may require municipalities and state agencies to obtain additional resources. Municipalities and state agencies have four options for purchasing debris management services:

- Mutual aid agreements with other municipalities within the designated counties. The costs would be reimbursed through the municipality requesting mutual aid.
- Use an existing municipal contractor to provide services if the original contract's estimated dollar value will not be exceeded.
- Use an existing state contract to manage debris. State Contracts are administered through the MA Operational Services Division and are open to cities and towns.
- Establish new contracts specifically for the purpose of managing the disaster debris.

The Commonwealth of Massachusetts has Master Service Agreements for Disaster Debris Management (PSE03) and Disaster Debris Monitoring (PSE02) in place that can be used by any state agency or municipality for Tier 3 or 4 events. Contract FAC103, landscaping and other heavy equipment services, has multiple vendors that can be used by municipalities to address Tier 1 and Tier 2 events. Municipalities can contract with these vendors in advance so that contracts are in place ahead of time. Municipalities do not need MEMA permission to contract against these vendors or to contract on their own. Municipalities requesting assistance that have not utilized contracts may be directed to do so before state assistance is provided.

MEMA's Fiscal Unit has developed State Contract User Guides for both PSE03 and PSE02 to provide state and local officials information on how to use each contract. These user guides are available upon request by MEMA's Chief Administrative Officer or Fiscal Office Coordinator.

# 8.0 Administration and Logistics

## 8.1 Plan Maintenance

This Plan will be reviewed in accordance with MEMA's Emergency Management Program Administrative Policy, by participating agencies and organizations in a manner conforming to the review and maintenance guidelines contained in the State CEMP. MEMA's Planning Unit will provide administrative support for the review process, including identifying plan stakeholders, inviting participants, developing meeting agendas, facilitating meetings, compiling, and distributing meeting notes/minutes, and developing the draft plan.

## 8.2 Training and Exercise

This Plan will be exercised on a regular basis, either via a stand-alone exercise or as part of a larger exercise that incorporates the coordination of a debris event. All exercises will follow Homeland Security Exercise and Evaluation Program (HSEEP) guiding principles for developing, executing, and evaluating exercises.

## 8.3 Expenditures and Reimbursement

Individual agencies and organizations will be responsible for tracking costs incurred and maintaining associated supporting documentation for possible reimbursement via applicable funding sources.

# 9.0 Authorities

The State has the authority to respond to debris generating disaster events – in order to clear public property, roads, and facilities of debris in a safe and efficient manner and dispose of debris in compliance with federal and state environmental regulations. The Plan is developed, and maintained under the following statutes and regulations:

State

- Chapter 639 of the Acts of 1950, The Massachusetts Civil Defense Act
- Massachusetts Executive Order 144, September 27, 1978
- Chapter 584 of the Acts of 1987, An Act Relative to the Management of Solid Waste and the Abatement of Pollution Resulting Therefrom
- Massachusetts General Laws Chapter 16, Section 21
- Massachusetts Department of Environmental Protection – Solid Waste Master Plan

Federal

- Public Law 100-707, The Robert T. Stafford Disaster Relief and Emergency Assistance Act
- Code of Federal Regulations (CFR) Title 44
- Code of Federal Regulations (CFR) Title 23, Highways
- Public Law 94-580, The Resource Conservation and Recovery Act of 1976
- Americans with Disabilities Act of 1990, Title II

# Appendix A: State-Owned Debris Management Site Standard Operating Procedure

## Purpose

This document provides a Standard Operating Procedure (SOP) for personnel serving in the Debris Management Group in the SEOC. The SOP provides guidance on actions to be taken to identify, select, assess, secure, and manage a temporary state-owned property for the purposes of debris management activities.

## Scope

This SOP is to be utilized by the SEOC Debris Management Group as needed to identify, select, assess, and secure a state-owned property to be temporally used as a state Debris Management Site (DMS).

## Reporting and Coordination

The Debris Management Group reports to the SEOC Deputy Operations Section Chief for ESFs or to the Operations Support Branch Director, depending on the level of SEOC activation. As needed, the Debris Management Group coordinates with:

- MEMA Legal Counsel
- DCAMM Legal Counsel
- MEMA Finance and Administration or the SEOC Finance and Administration Section Chief
- MEMA Recovery Unit or SEOC Recovery Unit
- State Vendor for Debris Management (i.e., Ashbritt)
- State Vendor for Debris Monitoring (i.e., O'Brien's Response Management Inc.)

## Identifying Available State-Owned Properties

To leverage a state-owned property for the purposes of debris management the following actions should be taken by the Debris Management Group:

- Contact the Massachusetts Division of Capital Asset Management and Maintenance (DCAMM) Director of Property Operations to request an updated list of state-owned properties.
    - DCAMM maintains a list of properties, which includes information about property such as the address, and number of acres.
- Provide DCAMM with any specific DMS requirements or data sets needed for the debris management mission. (e.g., acres needed, or a certain location within the state.)
- Ensure DCAMM is utilizing the DMS criteria listed in Appendix B: Debris Management Site Operations.
    - The DMS criteria are recommendations only and sites do not have to meet every part of the criteria.
    - A request for DCAMM-owned property (for debris management specific purposes) may take up to 1-2 days to fulfill.

### Property Selection

From the list of state-owned properties provided by DCAMM, select a DMS. When selecting a property consider the following:

- Narrow the list of state-owned properties down to 3-5 sites.

- Ensure the final 3-5 sites meet all the debris management mission-specific requirements.
- Consult with DCAMM to answer any questions or concerns about a property (e.g., open or closed parcels on property.)

### Site Assessment

When a final selection of a state-owned property is made, the following steps should be taken:

- Assemble a team to deploy and conduct a property site assessment.
    - Consider leveraging state personnel already in the field to conduct the assessment.
    - If no field personnel are available, recruit staff from the SEOC, REOC, MEMA (non-activated), DCAMM, and MassDEP.
    - Consult with MassDEP before deploying to review any potential issues or concerns with the state property that would require an alternative selection.
- Once on site the assessment team should document and take pictures of the site. Pictures should be saved and uploaded, to the appropriate file location in the ESF folder on Microsoft SharePoint, as directed SEOC Deputy Operations Section Chief for ESFs or to the Operations Support Branch Director.
- Determine if the property meets the need of the debris mission.
    - If not, return to the list of DCAMM state-owned properties selected and repeat the site assessment process.
- Complete the MassDEP Disaster Debris Management Site Selection Worksheet (attached to this SOP) and submit a copy to the Solid Waste Section Chief in the appropriate MassDEP regional office.

### Site Selection and Final Approval

- Once a DMS is selected, consult with the Deputy Operations Section Chief for ESFs, or the Operations Support Branch Director, for final approval.
- Notify DCAMM and MassDEP of the approved DMS location.

### Secure Agreement for the Approved Site

- Coordinate and convene a meeting with DCAMM Legal, MEMA Fiscal, MEMA Legal, MEMA Operations, and a representative of the approved DMS site to discuss and write a license agreement.

### Management of DMS

Once a leasing agreement is in place with the property owner/ state agency, the following steps will be used:

- Activate state contract for debris monitoring, if not already done.
- Coordinate with the representative of the State Vendor for Debris Monitoring to discuss staffing issues or concerns about the site.
- Establish a reporting structure with deployed Vendor staff to ensure ongoing situational awareness.
- Review demobilization process for the DMS(s) and draft a demobilization plan. Use the Monitoring Contract User Guide, and the State Disaster Debris Management Plan, as references.

## Contact Information

- DCAMM Primary: Director of Property Operation.
- State Vendor for Debris Management: See Monitoring Contract User Guide
- State Vendor for Debris Monitoring: See Monitoring Contract User Guide

## SOP Maintenance

This SOP will be reviewed and updated annually by the SEOC Operations Support Branch and/or Debris Management Group.

# Disaster Debris Management Site Selection Worksheet

## Section 1: Site Information

Site Name:
Site Address:
Estimated Site Size in Acres:
Estimated Volume of Debris Able to Hold (cubic yards):

*Note: assume up to 16,000 cubic yards/acre and only 40 percent of site available for debris storage.*

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## Section 2: Site Contact Information

Primary Local Government Point of Contact:
Name _____Phone _____Email _____

Secondary Local Government Point of Contact:
Name _____Phone _____Email _____

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## Section 3: Preferred Disaster Debris Management Site Criteria

1. The site is owned or controlled by municipal or state government.
   The site has easy access, including being near the area of debris generation, easy to enter and exit, and near transportation arteries.
2. The site is ready to use as a debris management site without extensive site modifications.
3. The debris storage and handling areas would be at least 100 feet from property lines.
4. To the maximum extent possible, the site location minimizes potential environmental and public health impacts, including considering setbacks from public water supplies, surface water bodies, and residential dwellings and avoiding areas such as flood plains, Zone II drinking water areas, and Areas of Critical Environmental Concern.

If any of these criteria are not met, please explain why not, and how any concerns regarding each criterion would be addressed:

---

## Section 4: Anticipated Site Activities

*Note: intended for use only in declared disaster, NOT for routine operation.*

1. A site plan and layout has been prepared that considers the management and operating practices recommended in this guidance (**check Yes__ or No__**)

2. What types of disaster debris do you expect to manage at this site? (e.g., vegetative waste, C&D debris, hazardous household products, etc.)

3. What debris processing or other handling activities do you expect to conduct at this site? (e.g., sorting and transfer for recycling, chipping vegetative waste, transfer of trash for disposal, etc.)

4. Summarize any other benefits or concerns with using this site as a debris management site.

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## Section 5: Submit Completed DMS Worksheet

Submit a copy of this completed DMS worksheet to the Solid Waste Section Chief, MassDEP Regional Office.

# Appendix B: Debris Management Site Operations

The information below is based on MassDEP's Disaster Debris Planning Guidance. For more information visit the following websites:

https://www.mass.gov/doc/disaster-debris-management-planning-an-introduction-for-local-government-officials/download

https://www.mass.gov/doc/massachusetts-local-disaster-debris-management-plan-checklist/download

## Debris Management Sites

A debris management site is a temporary location for storing, and/or processing (including recycling and volume reduction) of disaster debris prior to consolidating and shipping to a facility for recycling, composting, or disposal. Debris management sites are important in supporting initial debris clearance activities, as well as more efficiently coordinating final debris management. Primary debris management sites will be designated and operated by local governments and/or their contractors. Activation of state sites will be coordinated by MEMA or the SEOC in the event the SEOC is activated.

Debris management sites should not be used for storing, transferring, processing, or otherwise managing debris except when a State of Emergency has been declared for that area. In normal circumstances, without a declared State of Emergency, these types of operations would typically require solid waste permitting and site assignment.

The debris management sites should be operated in such a way to maintain separation of pre-sorted debris, control access to the site, and minimize nuisance conditions (i.e., noise, dust, and odor) and other environmental impacts. Debris management sites may be of different sizes and have different siting criteria depending on the type and volume of materials they are intended to handle. For example, sites that will need to accept large amounts of vegetative waste and building debris would need to be very large sites with flat open areas that could accommodate very large amounts of debris.

## Site Identification and Location

Whenever possible, locations that can serve as debris management sites should be determined at the local level well in advance of a disaster. If locally designated sites are insufficient to manage the amount of debris generated, state properties may be considered as potential debris management sites. Locating an appropriate debris management site requires evaluating a wide range of factors, including parcel size, topography, and ownership, in addition to past uses of the land and its proximity to residences, water supplies and wetlands. Poorly sited management sites can quickly fill with debris and/or lead to nuisance conditions, contamination of water supplies, damage to other resources, and create public health risks.

Where possible sites generally should not be:

- Within an identifiable or known floodplain and flood prone areas.
- Within 250 feet of a private drinking water supply.
- Within 500 feet of a public drinking water supply.
- Within 100 feet of a surface water body.
- Within 250 feet of a residential dwelling.

- Within an Interim Wellhead Protection Area or Zone II.
- Within an endangered species habitat or historic site.
- Less than 100 feet from property lines.

Where possible, storage and management sites should be:

- Owned or controlled by municipal or state government.
- Large enough to accept and store large quantities of debris (recommend 50-100 acre sites for large debris management areas).
- Easy to access, near the area of debris generation, easy to enter and exit, and near transportation arteries.
- Ready to use as management areas without extensive site modifications.

Other issues to consider when establishing debris management areas:

- Sites with overhead power transmission lines need careful consideration due to large dump body trucks/trailers used to haul debris, and underground utilities need to be identified due to the potential for site disturbance by truck/equipment traffic and possible site grading.
- Testing of the soil, groundwater and/or surface water at a proposed management area prior to receipt of debris to know whether contaminants at the site simply represent pre-existing conditions or are due to the operation of the management site.
- Using inactive or capped landfills as debris sites to eliminate the burn option due to explosion potential from methane in landfill gas. Additionally, closed landfill sites may be poor sites to use due to the potential to damage the landfill cap.

Operationally, debris management sites provide a location for trucks to haul to, or the public to self-haul, disaster debris where it can be stored pending transportation to recycling or disposal facilities, or it can be chipped, crushed, or burned on site, or some combination of these activities. Debris management sites also will be used to consolidate debris into larger trucks and/or rail cars for shipment to recycling, composting, or disposal facilities. The combination of activities that may occur at a given site will be a function of the type of debris managed and the characteristics of the site. The sites should be operated in such a way to maintain separation of pre-sorted debris, control access to the site, and minimize nuisance conditions (i.e., noise, dust, and odor) and other environmental impacts. Sites may be managed directly by a public agency or privately under contract.

Debris management sites may be of different sizes and have different siting criteria depending on the type and volume of materials they are intended to handle. For example, sites that will need to accept large amounts of vegetative waste and building debris (the two largest debris streams in most disaster events) would need to be very large sites with flat open areas that could accommodate very large amounts of debris. Such sites would likely need to operate for a long period of time before they can be fully cleared out and closed. On the other hand, some sites may be used for smaller volume debris streams such as white goods (appliances), electronics, and hazardous household products and may be able to be operated at smaller sites such as local Departments of Public Works facilities, transfer stations, or recycling centers.

### Managing Site Operations

Debris management sites are only intended for use during a disaster event. In the absence of a disaster, the site, and any activities on site, would be subject to solid waste permitting and site

assignment regulations. During a declared state of emergency, MassDEP may waive these regulatory requirements to allow the temporary operation of debris management areas for up to 90 days. Entities that need to operate a DMS beyond that 90-day period will require separate approval from the Solid Waste Section Chief in the appropriate MassDEP regional office.

Debris management sites should have:

- Stormwater controls, such as silt fences, to prevent discharge of contaminated runoff into water bodies.
- Controls to prevent offsite migration of dust, wood chips, or other debris residuals from vehicular traffic and from the handling of debris.
- Spotters to correctly identify and segregate waste types for appropriate management.
- Fencing surrounding the operating areas of the site.
- An attendant during operating hours.
- Access control and security measures after operating hours to limit unauthorized access to the site.
- Signs to inform haulers and the public of the types of waste accepted, hours of operation, and who to contact in case of afterhours emergency.
- Fire control equipment available on site.

<u>Other Best Management Practices</u>

1. To the maximum extent possible, debris received at the management site should be separated into the following categories and should be stored separately to minimize cross-contamination:
    a. Vegetative waste
    b. Construction and demolition (C&D) debris
    c. White goods
    d. Household trash and bulky waste
    e. Other separated recyclable categories where applicable (i.e., metal, asphalt, brick, and concrete, etc.)
2. One of the main functions of a debris management site will be to serve as volume reduction and consolidation areas for debris brought to the sites from the impacted areas. Volume reduction methods may include recycling, chipping for mulch, chipping for biomass fuel, and burning. For grinding and chipping to be feasible, the chipped material must have a viable use either as mulch or as wood chips for fuel.
3. Other debris, such as construction and demolition (C&D) debris, household waste, etc. should <u>not</u> be mixed with vegetative waste at a management site.
    - Only clean vegetative waste should be chipped.
    - Incoming waste loads containing non-vegetative debris and other unauthorized wastes should not be unloaded at the vegetative debris portion of the site.
    - It is the responsibility of the operator to remove and properly dispose of any unauthorized, non-vegetative wastes that were inadvertently or illegally disposed at the site.
    - Mixed C&D debris should be sent to a C&D processor that can separate and divert metal, asphalt, brick, and concrete, wood, and other materials, when possible.
    - If C&D debris contains asbestos, it must be managed as regulated asbestos- containing material.

- Trash delivered to the management site should be placed in transfer trailers at the end of the working day, and all windblown/scattered debris should be picked up at the end of the day.

4. In accordance with the National Fire Protection Association (NFPA), mulch and chip piles should not exceed 18 feet in height, 50 feet in width or 350 feet in length. Piles should be subdivided by fire lanes at least 25 feet wide around each pile. These piles should not be compacted. Smoking should only be allowed in designated areas well away from any combustible material. The local fire department should be notified upon commencement of debris management site activities.

Notification and Inspection

Within 48 hours of opening a debris management site, the municipality should submit a written notification to MassDEP which would include:

- A description of the nature of the site operations (types of material accepted and how managed, operating hours).
- A description of the physical address and, if available, GPS coordinates.
- A description of any operating conditions or practices not addressed in this guidance.
- Where materials will be sent from the management site.
- A local contact person and that person's contact information (where possible).
- MassDEP reserves the right to inspect the management site operations at all reasonable times. Additional operating conditions may be required by MassDEP to address public health, environmental, or nuisance concerns.
- The site owner or operator should track all operating costs in accordance with FEMA requirements if cost reimbursement is to be pursued with FEMA.

Operation of Air Curtain Burners and Management of Ash Residue

MassDEP generally does not support air curtain burning of debris where other debris management activities, such as chipping for mulch or fuel chips, are available. If the volume of vegetative waste is more than grinding and chipping operations can handle, burning may be an appropriate method of volume reduction. However, permit approval for burning will be limited to clean vegetative waste and will only be granted after all other volume reduction methods have been exhausted. If burning is permitted, air curtain pit burners will be the preferred method. Open burning will be considered an option of last resort.

In air curtain burning, material is burned in a burn pit or refractory lined box, aided by fan-forced air. The air curtain equipment consists of a large capacity fan, air ducts, a manifold, and in some cases a steel refractory lined box. In some cases, berms may be constructed to create a pit. The manifold directs a curtain of air over the burn pit or box. The air curtain, which acts as a lid for the incinerator, is deflected off the far wall of the burn pit into the fire, providing excess oxygen that increases fire temperature and results in more complete combustion. Air curtain units may be constructed close to the site of the materials and can reasonably reduce the volume of vegetative matter that is of low value for other uses. If air curtain burning is allowed, the site operator may use only fossil fuels, e.g., diesel, kerosene, to ignite the fire. Burning of tires, asphalt shingles, and other similar materials will not be allowed.

Air curtain units have limited application and may be a slower debris processing method than chipping, as they must be shut down from time to time as ash builds up and needs to be removed. Prior to

removal the ash must be allowed to cool for at least two hours and then removed for proper disposal or use, if approved by MassDEP. No burning shall be allowed within 1000 feet of any building, other debris, or vegetation, or as required by the local fire department. Controlled burning is prohibited within 1500 feet of a commercial or private airport property, or any area associated with airport flight operations.

### Debris Management Site Closure

Debris management areas should only be operated if it is necessary to store and process disaster debris that cannot be handled by the existing solid waste management infrastructure. These are only intended to operate as temporary management areas, not as ongoing solid waste facilities. Debris is expected to be processed and removed from management areas as quickly as possible so that debris can be safely managed, and the site expeditiously returned to its previous use. Once this activity is completed, debris management areas must be properly closed. Otherwise, they may be subject to MassDEP enforcement.

Final written approval is required from the MassDEP Solid Waste Section Chief in the region the site is located to consider any debris management site to be properly closed. The management site operator should contact the appropriate MassDEP regional office to discuss what is necessary for site closure and should again notify the regional office when closure is deemed complete. Depending on the amount of debris generated by a disaster, closure of processing/recycling sites shall generally be within six (6) months of first receiving waste. If site operations will be necessary beyond this time frame, permitting of the site by the Solid Waste Section may be required.

Management sites should meet the following guidelines to ensure proper closure:

- Within 90 days of completing processing at a chip site, all chips and mulch shall be removed for beneficial uses, unless MassDEP approves storage of these materials at the site for a longer period. All other recyclable materials should be sent to a recycling facility prior to closure.
- Unprocessed wood wastes at a chip site, or other materials that cannot be diverted from disposal, must be removed, and sent to an appropriate disposal site prior to closure.
- Prior to closure of the storage site, all remaining debris, equipment, and other materials must be removed and delivered to a proper disposal or recycling facility and the site should be restored to its original condition to the maximum extent possible.
- At close-out, final testing of soil, water, and air quality should be compared to original conditions.
    - Areas that were only used to stage vegetative debris, or ash from burning solely vegetative debris, will not require any environmental sampling after the debris or ash is removed unless there is reason to believe that the area may have become contaminated (e.g., significant visible staining or known contaminant releases in the area).
    - Areas that were used to stage mixed debris, or ash from burning mixed debris, will normally require environmental sampling after the debris or ash is removed unless there is reason to believe that no contamination occurred.
    - When environmental sampling for soils and groundwater is needed, it should typically include at least one soil sample and one groundwater monitoring well in areas showing significant visible staining or areas believed to be impacted by the staged waste or ash. Unless otherwise approved by MassDEP, these samples should normally be analyzed for total RCRA metals, volatile organic compounds and semi-volatile organic compounds

using approved EPA methods. MassDEP may also require other approaches to conducting environmental sampling at management areas on a case-by-case basis.

# Appendix C: Hurricane Debris Estimation Model

To forecast a rough estimate of the overall amount of debris that may be generated by a hurricane, the US Army Corps of Engineers (USACE) has developed generic model estimation tool which provides estimates of potential debris volumes, need for commodities, and number of people and households impacted.

The estimates produced by the USACE model are predicted to have an accuracy within 30% (accuracy is limited due to the many variables inherent in the debris removal process). There are additional wastes that are not estimated by this model (e.g., hazardous household waste, white goods, electronic equipment, vehicles, boats, and animal carcasses) which have special management requirements. Therefore, some additional acreage may need to be added to the USACE model prediction.

Even a rough estimate of debris generation will enable municipalities to understand what local resources will be needed to manage disaster debris as well as at what point local resources would likely be overwhelmed and state and/or federal assistance required. In addition to having an estimate of the overall amount of debris that may need to be managed, it also is important to anticipate what types of debris may be generated. The Army Corps model can be found at: www.usace.army.mil/missions/emergencyoperations/disasterimpactmodels.aspx

## Hurricane Debris Estimation Model Factors

Factors which go into the USACE hurricane debris-estimating model are:

- Households in your jurisdiction
- Storm category (1-5)
- Vegetative cover (light, medium, or heavy)
- Commercial density (light, medium, or heavy)
- Precipitation factor (none/light, or medium/heavy)

***Example***: For a municipality with 10,000 households and medium vegetative and commercial density, a worst-case debris estimate based on this model would be:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10,000 households | x | 26 cubic yards cat 3 storm factor | x | 1.3 veg. cover | x | 1.2 comm. Density | x 1.3 precip. factor | = 527,280 (cy) |

Factors which go into the USACE model for estimating the amount of space needed for managing that debris includes:

- Quantity of debris in cubic yards
- Volume of debris per acre (16117 cubic yards per acre)
- Factor for area needed for roads and buffers (1.66)

***Example***: For a municipality with 527,280 cubic yards of debris, the debris management space estimate based on this model would be:

527,280 cubic yards / 16117 cubic yards/acre x 1.66 = 54.31 acres
amount of debris volume of debris per acre factor for roads and buffer

Table 1 below presents the estimated amount of debris that might be generated by a Category 3 hurricane, and the space needed to manage that debris, for each county in Massachusetts.

**Table 1: Category 3 Hurricane Debris Estimates for each Massachusetts County**

| USACE Debris Model | | | | |
|---|---|---|---|---|
| County | Population | Housing Units | Debris Estimate (cy) | DMS Acres |
| Barnstable County Total | 228,996 | 164,885 | 8,694,056 | 895 |
| Berkshire County Total | 129,026 | 69,759 | 3,678,253 | 379 |
| Bristol County Total | 579,200 | 243,464 | 12,837,370 | 1,322 |
| Dukes County Total | 20,600 | 17,530 | 924,322 | 95 |
| Essex County Total | 797,936 | 327,185 | 17,251,811 | 1,777 |
| Franklin County Total | 71,029 | 34,345 | 1,810,943 | 187 |
| Hampden County Total | 465,825 | 197,033 | 10,389,156 | 1,070 |
| Hampshire County Total | 162,308 | 66,245 | 3,492,966 | 360 |
| Middlesex County Total | 1,632,002 | 658,283 | 34,709,946 | 3,575 |
| Nantucket County Total | 14,255 | 12,169 | 641,647 | 66 |
| Norfolk County Total | 725,981 | 291,489 | 15,369,632 | 1,583 |
| Plymouth County Total | 530,819 | 214,770 | 11,324,393 | 1,166 |
| Suffolk County Total | 797,936 | 349,616 | 18,434,552 | 1,899 |
| Worcester County Total | 862,111 | 351,764 | 18,547,812 | 1,910 |
| **Total – Massachusetts** | 7,029,917 | 2,998,537 | 158,106,859 | 16,285 |

*Note: Debris estimation calculations in Table 1 are based on the USACE Debris Estimation Model.*
*Source: U.S. Census Bureau, Census 2020 Population and Housing Unit.*

# Appendix D: Hazards and Associated Types of Debris

The table below lists the hazards identified in Massachusetts Hazard Identification and Risk Assessment (HIRA), and cascading hazards, that are specific to a debris event and the type of debris each hazard typically generates.

| Hazards | Type of Debris |
|---|---|
| **Hurricanes:**<br>The damaging forces of hurricanes and tropical storms include high velocity winds (up to 150 miles per hour or higher in gusts), storm surge, and wave action. The most severe damage frequently occurs along the coast. The effects of a hurricane often extend far inland, with significant tree and structural damage. Hurricanes are rated from categories 1 through 5. | • Vegetative<br>• Soils and Sediments,<br>• Building and Construction Materials<br>• Hazardous Household Products<br>• Household Bulk Waste<br>• Vehicles |
| **Ice/Winter Storms**:<br>Ice and winter storms cause damage to trees, utility lines/infrastructure, and wide span roofs. Coastal storms may flood developed areas and erode near shore areas. Disposal of possibly contaminated snow and ice from roadways is also a consideration. | • Building Materials<br>• Construction Materials |
| **Tornadoes**:<br>Damage from tornadoes is caused by high velocity rotating winds. Like hurricanes, tornadoes are rated on a numerical scale based on the severity and other characteristics. The amount of damage depends on the size, velocity of winds, and duration of funnel contact with the earth. Contact paths may range from a mile or less in width and from 100 yards to several miles in length. Tornadoes may skip across a wide area with several touchdowns. | • Vegetative<br>• Soils and Sediments,<br>• Building and Construction Materials<br>• Hazardous Household and Commercial Products<br>• Household Bulk Waste<br>• Vehicles |
| **Floods:**<br>Flooding causes damage to property due to inundation and erosion. Flooding is often confined to discernible floodplain areas but may also occur as a result of a dam failure or flash flood in areas downstream of higher elevation streams, ponds and rivers. | • Vegetative<br>• Soils and Sediments,<br>• Building and Construction Materials<br>• Hazardous Household and Commercial Products<br>• Household Bulk Waste<br>• Vehicles<br>• Infectious/Medical Waste |
| **Earthquakes:**<br>Earthquakes cause damage by shock waves and earth movement along fault lines and over some distance from the center of the quake. Secondary damage from fires can be substantial. | • Building and Construction Materials<br>• Hazardous Household and Commercial Products<br>• Household Bulk Waste<br>• Vehicles |
| **Infectious Diseases:** | |

| | |
|---|---|
| Infectious diseases may be either animal diseases or human pandemic diseases, each of which results in different infectious and/or medical wastes that require specific management approaches. | |
| **Avian Flu and Other Animal Diseases**<br>Infectious animal diseases pose unique debris management challenges, with the key issue being the need to reduce the potential for disease transmission while safely managing diseased carcasses and associated materials. Disposal of animal carcasses may also be an issue in other disasters, especially floods. | • Animal Carcasses<br>• Infectious/Medical Waste |
| **Human Pandemic Disease:**<br>A human pandemic disease also would create challenging debris management problems, particularly in terms of managing medical waste and other infectious debris. In such an event, it would be critical to manage infectious wastes separately from regular trash to limit the amount of material that needs to be managed as infectious waste. | • Hazardous Household and Commercial Products<br>• Commercial Hazardous Waste<br>• Infectious/Medical Waste |
| **Terrorist Attacks:**<br>The nature and amount of debris from a terrorist attack could vary widely depending on the nature of the attack and the target. A terrorism event is by law a crime and the site is considered a crime scene. Debris operations may come under the direction of Federal law enforcement officials who may have little knowledge or experience in debris management, but rather are focused on investigating the scene and gathering evidence. This will likely result in delays in clearing and managing debris. | • Building Debris<br>• Bulky Waste<br>• Vehicles and Vessels |
| **Facility-Based Disasters:**<br>This could include large fires or chemical spills. Release of hazardous chemicals, either through air releases or releases to land or water, could pose health risks to nearby areas. Such a disaster could occur at a fixed facility or while chemicals are being transported along railways or roadways. | • Hazardous Household Product<br>• Commercial Hazardous Waste |

# Appendix E: Disaster Debris Management Resources

## State Resources

MA Department of Environmental Protection Disaster Debris Management Planning: An Introduction for Local Government Officials: https://www.mass.gov/files/2017-07/debrguid.pdf

Massachusetts Compost Sites List: https://www.mass.gov/files/documents/2017/01/vl/actcomp.pdf

Massachusetts Construction and Demolition (C&D) Wastes:
https://www.mass.gov/lists/managing-construction-demolition-cd-wastes

Massachusetts Landfills List: https://www.mass.gov/lists/massachusetts-landfills-transfer-stations-compost-sites-recycling-facilities

Massachusetts Combustion Facilities List: https://www.mass.gov/doc/list-of-active-combustion-facilities-in-massachusetts-january-2020/download

Massachusetts Inactive or Closed Landfills List: https://www.mass.gov/doc/list-of-inactiveclosed-landfills-dumping-grounds-in-massachusetts-january-2020/download

Finding Recycling Facilities and Resources in Massachusetts:
http://www.recyclingworksma.com/

## Federal Emergency Management Agency (FEMA)

FEMA Public Assistance Program and Policy Guide:
https://www.fema.gov/sites/default/files/documents/fema_pappg-v4-updated-links_policy_6-1-2020.pdf

FEMA Public Assistance Debris Monitoring Guide:
https://www.fema.gov/sites/default/files/documents/fema_debris-monitoring-guide_sop_3-01-2021.pdf

FEMA's Public Assistance Debris Removal Tips Fact Sheet:
https://www.fema.gov/sites/default/files/2020-07/fema_pa_debris-removal-tips.pdf

FEMA's Public Assistance Private Property Debris Removal Fact Sheet:
https://www.fema.gov/sites/default/files/2020-07/fema_pa_private-property-debris-removal_factsheet.pdf

FEMA Regional contacts:
http://www.fema.gov/region-i-ct-me-ma-nh-ri-vt

## US Army Corps of Engineers

Corps of Engineers Emergency Response Portal:
http://www.usace.army.mil/missions/emergencyoperations/nationalresponseframework.aspx

## US Environmental Protection Agency (EPA)

EPA's Planning for Disaster Debris manual highlights planning for debris cleanup, including lessons learned from communities experienced in disaster recovery:
https://www.epa.gov/homeland-security-waste/guidance-about-planning-natural-disaster-debris

EPA special guidance on managing Asbestos Containing Materials in the course of building demolition following a large-scale disaster:
https://archive.epa.gov/katrina/web/html/debris.html

EPA information on construction and demolition (C&D) debris recycling:
https://www.epa.gov/smm/sustainable-management-construction-and-demolition-materials

EPA national listing of approved refrigerant (Freon) recyclers:
https://www.epa.gov/section608/epa-certified-refrigerant-reclaimers

# Appendix F: Massachusetts 2030 Solid Waste Policy Framework

The MassDEP's 2030 Solid Waste Master Plan (SWMP) establishes the Commonwealth's policy framework for reducing and managing solid waste that is generated, reused, recycled, or disposed by Massachusetts residents and businesses. The 2030 Solid Waste Master Plan proposes a broad vision and strategies for how the Commonwealth will manage waste over the next decade and beyond. The Massachusetts Department of Environmental Protection (MassDEP) has prepared the SWMP in accordance with the requirements of Massachusetts General Law Chapter 16, Section 21 and the Federal Resource Conservation and Recovery Act (RCRA).

The SWMP sets goals to reduce waste by nearly 30 percent annually, and to reduce the toxicity of the waste stream. Reducing the amount of waste will decrease waste management costs while conserving resources, saving energy, supporting jobs and economic development in Massachusetts, and reducing pressure on limited in-state disposal capacity. The plan proposes to reduce waste generation from a 2018 baseline of 5.7 million tons to 4.0 million tons by 2030. The toxicity of the waste stream is proposed to be reduced by improving the availability of household hazardous waste collection programs and implementing producer responsibility approaches for targeted materials.

The general objectives of the RCRA are similar to Massachusetts' goals: to promote and improve techniques for resource recovery and conservation, and to promote environmentally sound disposal for non-recoverable materials. The necessity to meet these objectives has become more acute as disposal costs escalate, the availability of landfill capacity decreases, and the need to conserve valuable resources has become more important.

The Commonwealth supports the objectives of the RCRA, and recognizes that during natural or technological disasters, terrorism events, or any other occurrence that results in significant amounts of debris, it will be necessary to expand existing procedures to separate, reduce, and recycle as much of the debris as possible. This practice will continue the Commonwealth's commitment to reuse, recycling, composting, use of select materials as fuels, and other diversions to preserve valuable limited disposal capacity for future use.

A copy of MassDEP's SWMP can be found at https://www.mass.gov/doc/2030-solid-waste-master-plan-working-together-toward-zero-waste/download

# Appendix G: Debris Disposal and Transfer Capacity

Massachusetts has a large amount of transfer station capacity, with more than 200 transfer stations, including several capable of transporting waste via rail lines. If a disaster generates large amounts of debris which would overwhelm in-state disposal capacity, transfer stations with rail access would be expected to handle a large portion of debris. Massachusetts transfer stations annually accept more than 3 million tons of material and could accept considerably more on an emergency basis. For lists of transfer stations and handling facilities, landfills, and combustion facilities see the MassDEP website at: https://www.mass.gov/lists/massachusetts-landfills-transfer-stations-compost-sites-recycling-facilities

The MassDEP's 2030 Solid Waste Master Plan recognizes that, along with recycling and composting facilities, export of waste via transfer stations is a core part of the state's ongoing waste management infrastructure and capacity.

Massachusetts has waste bans in place prohibiting certain hazardous, recyclable, and compostable materials from disposal in Massachusetts. MassDEP does have the ability to temporarily waive waste ban requirements in cases when these materials are not recyclable and could potentially take this step to expedite debris removal following a disaster. However, given that the need to divert materials from disposal becomes even greater following a disaster when disposal capacity may be overwhelmed, MassDEP may choose to maintain waste ban requirements to encourage high levels of diversion of recyclable and compostable materials. Massachusetts will use several approaches to address disaster debris management including:

- Diversion of as much material from disposal as possible through recycling, composting and other diversion options. This will limit increased use of valuable limited disposal capacity, while ensuring that materials are managed in the most environmentally preferable way. Large amounts of the following materials would be diverted from disposal:
    - Vegetative waste (chipped for mulch or fuel for biomass power plants, composted, or as a last resort, burned by an air curtain burner)
    - Building materials (asphalt, brick, and concrete crushed on-site or brought to crushing operation; other construction & demolition (C&D) debris brought to a C&D processor, unless contaminated by asbestos)
    - Appliances and electronics (delivered to recycling companies)
    - Vehicles (delivered to metal recyclers)
    - Hazardous household products (collected separately and delivered for hazardous waste management)

Use Massachusetts' in-state disposal capacity for disposal of disaster debris, allowing temporary tonnage increases on an emergency basis. MassDEP regional offices have the authority to temporarily increase permitted tonnage limits in emergency situations. However, given the limited number and size of facilities available in Massachusetts and the importance of preserving this capacity for the future, MassDEP does not anticipate that in-state disposal facilities could or should handle the full volume of debris generated by a major, widespread disaster.

MassDEP plans to rely on the approximately 200 transfer stations to transfer waste which cannot be diverted to facilities outside of Massachusetts for disposal. Because other Northeast states also have limited disposal capacity and could also be impacted by the same disaster events that affect Massachusetts, large transfer stations that are equipped to transport waste long distances by rail may

play an important role in managing exceptional amounts of debris generated by a disaster. Assuming these facilities are operational, they are able to ship waste to states not affected by the same disaster and have very large landfills which could accommodate large amounts of disaster debris in the short term without eliminating future capacity options.