

Debris Management Planning for State, Tribal, and Local Officials

E/G/L202—Student Manual, Volume I



FEMA



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Debris Management Planning for State, Tribal, and Local Officials

Introduction and Welcome



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Introductions

- Name
- Title
- Disaster Experience
- Current Assignment



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Course Description

Course Goal

**To enable participants to fully plan
for, respond to, and recover from
major debris-generating events**

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Present Course Goal

- The goal of the course is to enable State, Tribal, and local governments to successfully plan for, respond to, and recover from a major debris-generating event.
- This course provides the training necessary to achieve this goal.

Notes:



Course Description (Cont'd)

Course Objectives

- Apply knowledge of planning for, implementing, and managing debris activities
- Apply knowledge of FEMA eligibility and reasonable costs criteria as pertinent to Presidentially declared events
- Address debris planning, response and recovery concepts

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- Upon successfully completing this course, you will be able to complete the following tasks, which demonstrate knowledge and skills required to successfully plan for, respond to, and recover from a major debris-generating event.
 - Apply knowledge of planning for, implementing, and managing debris activities, including issues associated with:
 - environmental and historic preservation considerations
 - debris forecasting and estimating
 - debris contracting
 - Debris Management Site evaluation and operation
 - debris monitoring
 - supplemental assistance
 - Apply knowledge of FEMA eligibility and reasonable cost criteria as pertinent to Presidentially declared events.
 - Address debris planning and response and recovery activity issues in a Debris Management Plan Development Aid.

Course Description (Cont'd)

Course Materials

- Student Manual, Vol. I
- Student Manual, Vol. II
- *Debris Management Guide*
- *Public Assistance Guide*
- *Public Assistance Policy Digest*

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- Student Manual
 - Volume I—Unit lecture materials
 - Course slides and lists of basic information
 - Space for notes
 - References—A critical part of the course is to know how to locate needed information in the available resources
 - Volume II—Group Activity Materials
- *Debris Operations Job Aid, Debris Management Guide, Public Assistance Guide, Public Assistance Policy Digest*

Notes:



Course Description (Cont'd)

Course Units

Unit 1: Introduction to Debris Management Planning

Unit 2: Debris Quantity Forecasting and Estimating

Unit 3: Special Considerations

Unit 4: Eligibility and Reasonable Costs

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Course Units (Cont'd)

Unit 5: Debris Operations

Unit 6: Debris Monitoring Procedures

Unit 7: Debris Contracting Procedures

Unit 8: Developing Your Debris Management Plan

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Notes:



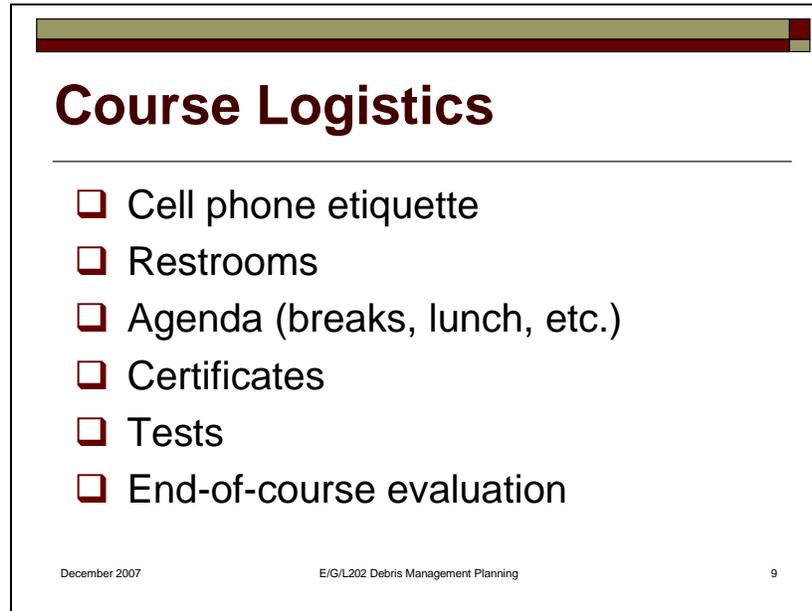
Course Description (Cont'd)

Course Activities

- Post-test
- Tabletop Activities
 - Apply unit objectives to debris-related scenarios
- Debris Management Plan Outline
 - Address debris planning issues relative to individual communities

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- Group Activities
 - Each course unit includes a group activity that provides you with the opportunity to apply individual unit objectives to debris-related scenarios.
 - You will work in groups to complete the activities, but you will be responsible for documenting your solutions on the activity data sheets.
- Debris Management Plan Development Aid
 - A Debris Management Plan Development Aid has been developed for this course.
 - This document is designed to assist individual communities in identifying and gathering critical information, determining which departments or organizations would best be equipped to supply the information, and for evaluating the components of a plan.
 - You will complete the indicated sections of the Debris Management Plan Development Aid after each unit of instruction, providing information specific to your jurisdiction's needs and resources. You should work independently to complete this task, but may consult with other participants for ideas and feedback.

COURSE LOGISTICS

Course Logistics

- Cell phone etiquette
- Restrooms
- Agenda (breaks, lunch, etc.)
- Certificates
- Tests
- End-of-course evaluation

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Relevant course logistics information includes:

- Cell phone etiquette
- Restrooms
- Agenda
- Certificates
- Post-Test (final end-of-course test) – Level II
- End-of-course evaluation (Level I – student reaction sheet or survey)

INTRODUCTION

Unit 1: Introduction to Debris Management Planning



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Unit Introduction

- Overview of a debris management plan
- Debris quantities in natural events are increasing:
 - Natural disasters are becoming more numerous and generating unprecedented amounts of debris.
 - More development is present in disaster-prone areas.
 - Large and more complex buildings, homes, and mobile home parks result in larger quantities of debris.
- Recent disasters:
 - Initial estimates of debris after Hurricane Andrew was 20 million cubic yards—enough to fill a football field a mile high—and took 6 months to remove.
 - In Puerto Rico, after Hurricane Georges, disaster-related debris amounted to 5 million cubic yards.
- To effectively prepare for and respond to debris-related issues, it is necessary to have an understanding of the types of debris that are generated in the various disasters.
- Therefore, this unit provides:
 - Typical types of disasters and resulting debris
 - Photo examples of typical debris situations that may be encountered in actual disasters
 - A discussion of general issues that should be considered in debris planning and issues that have arisen in recent disasters
 - An activity where you will assess potential debris issues based on the type and magnitude of the event

Terminology that will be used in this course

- Debris activities, debris-related activities:
 - The actual clearance, collection, hauling, reduction, and disposal actions being taken in the field
- Debris management:
 - The planning and coordination activities undertaken by the State/locals/Tribes to initiate and complete debris activities
- Debris operations:
 - The PA Program activities undertaken to address applicant-related debris management and activities

Notes:

Objectives

1. Identify Key Components of a Debris Management Plan
2. Identify Potential Disasters
3. Associate the types of debris generated by disasters

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Unit Objectives

At the end of this unit, you will be able to:

- Identify key components of a debris management plan
- Associate the types of debris generated by natural disasters.
- Identify critical debris management issues.

Notes:



APPLICANT DEBRIS MANAGEMENT PLANS

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Components of a Debris Management Plan

- Established debris management structure**
- Good assessment of the situation and assumptions**
- Well-defined debris collection plan**
- Identification of debris management sites**
- Procedures for contracted services**
- Process for demolition and debris removal from private property**
- Process for disseminating information**
- Safety**

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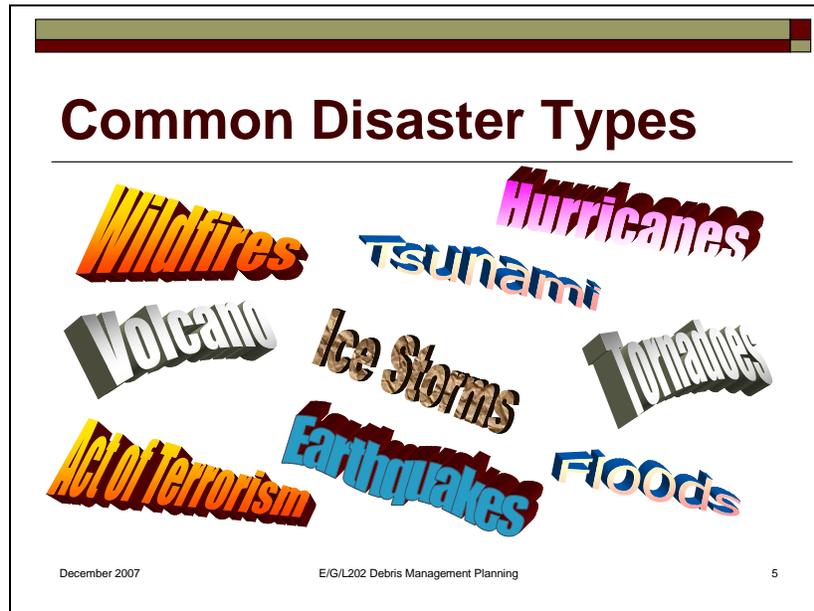
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The 8 components of a debris management plan are:

- Established debris management structure
- Good assessment of the situation and assumptions
- Well-defined debris collection plan
- Identification of debris management sites
- Procedures for contracted services
- Process for demolition and debris removal from private property
- Process for disseminating information
- Safety

Characteristics of Disaster Types



Characteristics of Disaster Types

- The following series of slides illustrates the characteristics of common disaster types.
 - These characteristics influence the type and magnitude of debris that is generated.
- Many disasters generate the same types of debris, however, the mix of debris will vary between disaster types.
 - Additional discussion of debris types will follow this section.
- Refer to the Matrix of Disasters and Their Debris Types provided as Reference A.
 - This Matrix lists the common types of debris-generating disasters and predominate types of debris generated by the identified events.
 - You may refer to this Matrix throughout this and following units.
 - Based on class discussion and personal experience within your community, you may add disaster or debris types to this Matrix.
- There are Other Disaster Types: tsunami, volcanoes, acts of terrorism.
- There are other types of disasters that occur less frequently—straight-line winds, microbursts—but their effects are similar to some of the disasters described.

Notes:



Characteristics of Disaster Types (Cont'd)

Hurricanes

Characteristics

- High velocity winds
- Storm surge
- Inland flooding



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Hurricanes

- Characteristics of a hurricane:
 - High velocity winds—ranging from 74 m.p.h. to more than 155 m.p.h.
 - Storm surge – Is the most destructive effect of a hurricane
 - Wave action—usually precedes hurricane winds, causing severe damage of beaches and seaside structures and buildings
 - Inland flooding—may occur even where winds do not reach hurricane force
- The effects of a hurricane can be devastating to both coastal and inland areas as depicted in recent hurricanes.
- Hurricanes can cause large quantities of every type of debris. Heavy rainfall can cause mass flooding, and high winds can become tornadoes causing additional damage to inland areas.
- Significant damage may occur to buildings, above-grade utilities, roadways, and vegetation.

Notes:



Characteristics of Disaster Types (Cont'd)

Tornadoes

Characteristics

- High velocity winds
- Narrow path
- Length – up to several miles



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Tornadoes

- Characteristics of a tornado:
 - High velocity winds—from 40 m.p.h. to more than 300 m.p.h.
 - Narrow path of impact
 - Length of impact—up to several miles
- The high winds of a tornado can debark trees, throw vehicles several hundred feet, and severely damage structures from wood-framed to reinforced concrete.
- Significant quantities of building rubble and uprooted vegetation can result from a tornado.
- Due to the high winds and tornado effects, debris is typically mixed and widely scattered.

Notes:



Characteristics of Disaster Types (Cont'd)

Flash Flood

Characteristics

- High velocity flows
- Erosion



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Flash Floods

- Characteristics of flash floods:
 - High velocity flows—destroying structures, vegetation, and infrastructure
 - Erosion
- Most areas of the country have experienced natural disasters in flooding.
 - Structural damage may occur from high velocity flow and forces from sediment transport.

Notes:



Characteristics of Disaster Types (Cont'd)

Riverine Flood

Characteristics

- Slow Rise and Fall of Water Level
- Inundation
- Sediment



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Riverine Floods

- Characteristics of a riverine flood:
 - Slow rise and fall of water elevation over a period of time
 - Inundation
 - Sediment
- Most areas of the country have experienced natural disasters in flooding.
- Structural damage may occur from flood saturation and sediment accumulation.
- Floods are often the most difficult disaster events relative to debris.
 - Often, all possessions are destroyed.
 - Clothes, furniture, personal effects
 - Carpet, sheetrock, wood
 - Debris is put out for collection in waves for long periods of time.
 - As water levels recede
 - Emotionally difficult to part with items
 - Some (particularly the elderly) may need assistance in moving objects

Characteristics of Disaster Types (Cont'd)

Earthquakes

Characteristics

- Shockwaves
- Movement along fault lines



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Earthquakes

- Characteristics of earthquakes:
 - Shockwaves—a series of long rolling actions or rapid vibration
 - Movement along fault lines—both vertical and horizontal can cause ground displacement up to several feet
 - Aftershocks for several days or even weeks
- Although relatively infrequent compared to the other disaster types, the effects are usually devastating
- Most large earthquakes occur on the west coast, but other areas of the country are also prone to earthquakes, perhaps to a lesser degree
 - New Madrid earthquake in the Missouri-Tennessee-Arkansas-Kentucky area
 - Major earthquakes have occurred in South Carolina and New England
 - Puerto Rico and the Virgin Islands are in earthquake-prone zones
 - San Andreas fault on the West Coast
- Damages include
 - Building and infrastructure damage
 - Damage to equipment and personal property from collapsed walls and roofs
 - Sediment from earthquake-induced landslides

Notes:



- Photograph is a house following the Northridge, California, earthquake of January 1995.

Characteristics of Disaster Types (Cont'd)

Wildfires

Characteristics

- Extensive burn areas
- Rural/Urban Interface



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Wildfires

- Characteristics of wildfires:
 - Extensive burn areas
 - Possible flooding and mudslides
- Damages resulting from wildfires include
 - Loss of vegetation
 - Damaged homes and buildings
 - Landslides and mudslides on burnt slopes when rains follow the fire
- Wildfires can produce a significant amount of debris with the increase of houses in woodlands.

Notes:



Characteristics of Disaster Types (Cont'd)

Ice Storms

Characteristics

- ❑ Catastrophic Accumulation of Ice/Snow
- ❑ Severe Damage to Vegetation/Structures/Utilities



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Ice Storms

- Characteristics of ice storms:
 - Catastrophic accumulation of ice and snow
 - Significant damage to vegetation
 - Travel is difficult—roads may be closed as a result of fallen trees and limbs
 - Power is disrupted and not easily repairable—utility poles and wires may be severely damaged and become debris
 - Continued cold weather may impede restoration of utilities
 - Combined with snow accumulation and rapid warming, flooding may occur
- Communities susceptible to ice storms must plan for extensive vegetative debris removal and reduction

Notes:



Characteristics of Disaster Types (Cont'd)

Tsunami

Characteristics

- Forceful
- Fast Moving
- Wide Area Coverage



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Tsunamis can occur anywhere where you have coastal exposure.

The characteristics of a tsunami include:

- Forceful
- Fast Moving
- Wide Area Coverage

A tsunami is very similar to storm surge damage as caused by a hurricane.

It can be more devastating, faster moving and can flow inland farther.

The receding waters pull debris back which can result in more marine debris problems.

Notes:



Characteristics of Disaster Types (Cont'd)

Volcano

Characteristics

- Explosive
- Molten Lava/Ash
- Localized/Wide Area Coverage



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Characteristics include:

- Explosive
- Molten Lava/Ash
- Localized/Wide Area Coverage

Notes:



Act of Terrorism

Characteristics

- Random
- Unpredictable
- Could produce conventional and unconventional debris



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Characteristics include:

- Random
- Unpredictable
- Could produce conventional and unconventional debris

Notes:



Disaster Intensity Scales

Hurricanes	Saffir-Simpson Scale
Tornadoes	Enhanced Fujita Scale
Earthquakes	Modified Mercalli Intensity Scale
Flooding	Probability
Ice Storm	Probability of return period
Wildfire	May relate to drought probability

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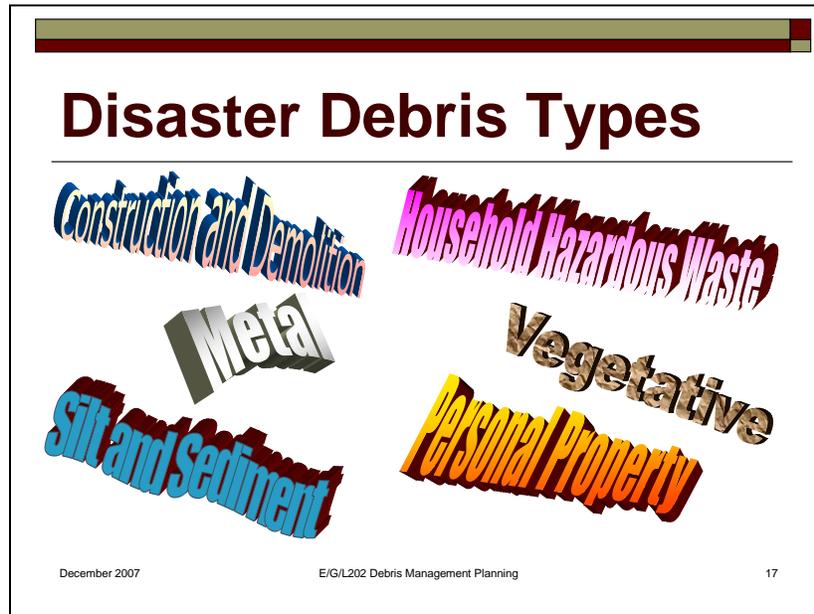
Disaster Intensity Scales

- Disaster Intensity Scales have been developed for hurricanes, tornadoes, and earthquakes that relate the intensity of an event to the anticipated type and magnitude of damage.
 - Disaster Intensity Scales for Hurricanes, Tornadoes, and Earthquakes.
- Other disaster types also have some measure of intensity:
 - Flooding: Normally identified by probability. For example, reference to a 100-year flood represents a 1% probability of occurring in any 1 year.
 - Ice Storms: Less defined but some areas do maintain records on return periods.
 - Wildfires: Difficult to affix a scale but some relate wildfire potential to drought probability.

Notes:



Debris Types and Issues

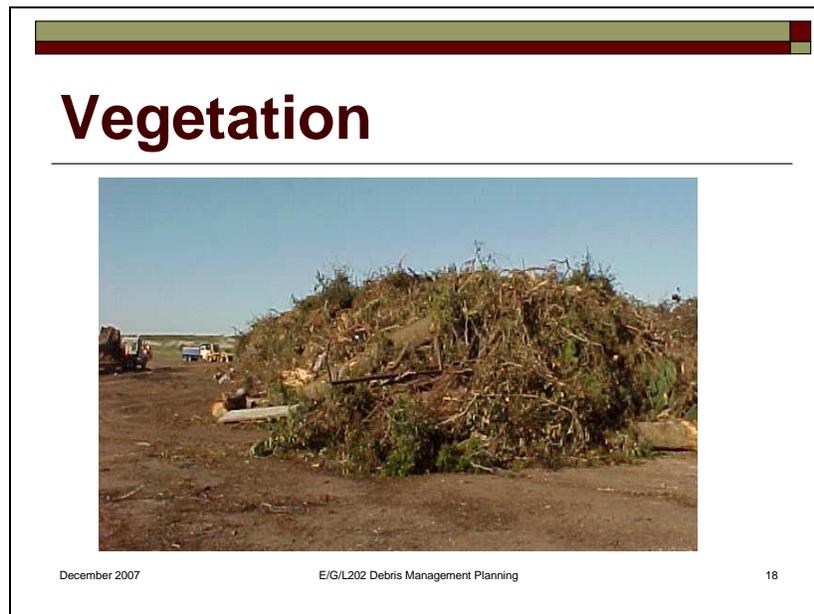


- The following slides identify the characteristics of debris generated by the various disaster types.
- As indicated earlier, many of the debris types will be generated by more than one disaster type, however, the magnitude and mix of the debris will vary between disasters.
- As these slides are shown, you should begin to consider how these types of debris will be handled in your community.

Notes:



Debris Types and Issues (Cont'd)



- Vegetative debris includes:
 - Trees
 - Brush
 - Limbs
- Vegetative debris will be generated from most disaster types:
 - Hurricanes and Tornadoes—significant quantities
 - Floods
 - Wildfires
 - Ice Storms—some of the largest amounts of vegetative debris come from ice storms
- Vegetative debris will be found both on public and private property, and will be found within streets, often blocking vehicle traffic.

Notes:



Debris Types and Issues (Cont'd)

Soil/Mud/Sand



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- Sediment and sand will result primarily from flooding events (floods and hurricanes).
 - Areas with unconsolidated or loose soil material may become almost a river of sediment during flood conditions.
 - Sediment flow conditions can be highly destructive and dangerous.
- Wildfires and earthquakes may also generate landslides and mudslides, resulting in the deposition of sand and rocks.
- Sediment flow combined with high velocity floodwater may cause extensive structural damage—both the sediment and structural debris will require disposal.

Notes:



Debris Types and Issues (Cont'd)

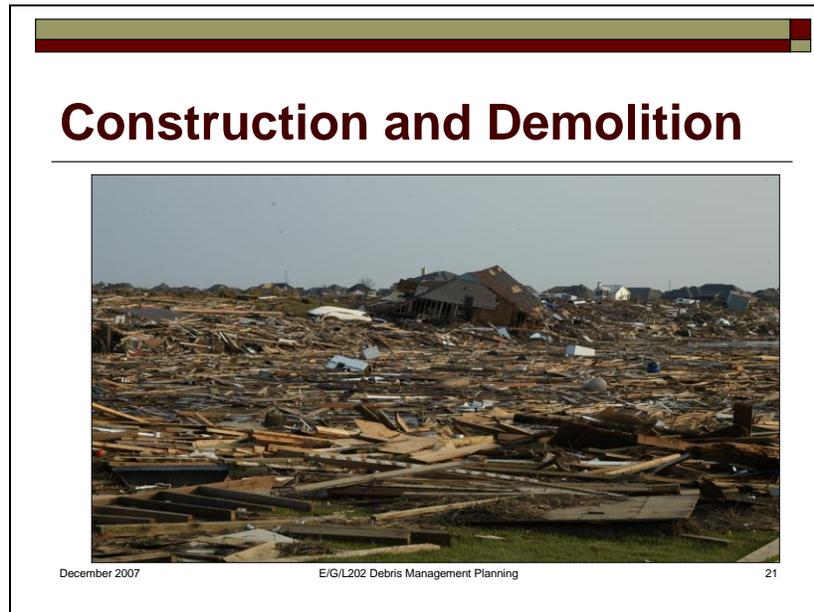


- Sandbags used to protect against flooding remain after floods recede.
- Removal of sandbags must be handled cautiously—they can be contaminated with pollutants from flooded sewage treatment plants, pesticides, herbicides, chemicals, and hydrocarbons. The sandbags must be tested and disposed of properly.

Notes:



Debris Types and Issues (Cont'd)



- Construction and Demolition (C&D) material is generated by damaged structures and can be present in most types of disasters to varying degrees (hurricanes, tornadoes, floods, and earthquakes).
- C&D materials may include disaster-damaged building materials and damaged contents.
- Some C&D materials can be recycled.
- The structure use and building materials must be evaluated to consider the potential presence of asbestos and other potentially hazardous materials.

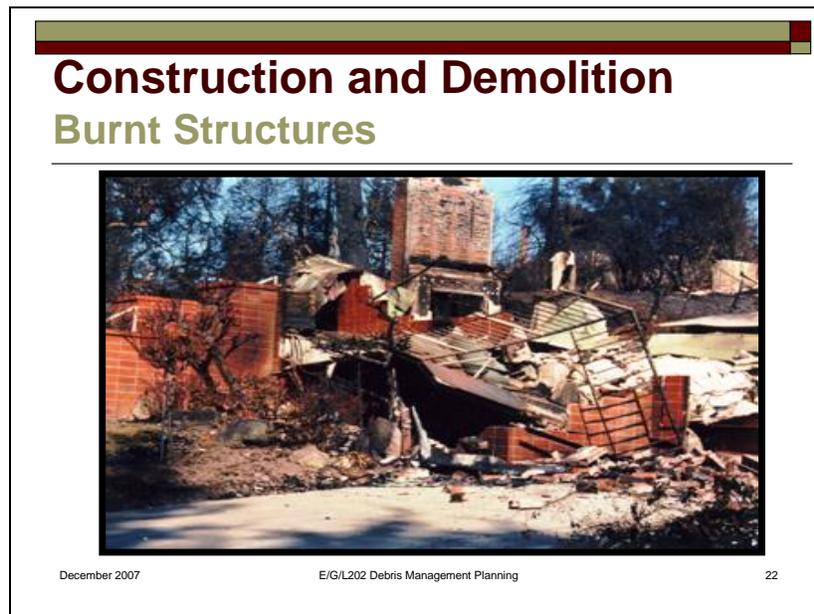
Utility Systems

- In addition to building damage, construction debris may include utility systems such as utility poles, wiring, conduits and other items from power, telephone, cable TV, and other utilities.
 - These damages should be expected in all types of disasters, with a significant concentration from ice storms.
 - It is necessary to coordinate closely with appropriate utility companies to define jurisdictional responsibilities and to encourage cooperation to expedite recovery.

Notes:



Debris Types and Issues (Cont'd)



- Charred wood and construction materials are a significant portion of wildfire debris, and may also result from earthquake or other disaster-induced fires.
- Charred materials may require different handling and disposal:
 - Resulting materials are often a mix of the building construction materials and contents, including asbestos and other hazardous material, but their presence may not be readily identifiable.
 - Burned asphalt often is included in this mix.
 - Must look at the method of disposal to determine how various possible components of this mix may be accounted for and paid for.
- Even if removal is the responsibility of the private landowner, the local community must consider its disposal.

Notes:



Debris Types and Issues (Cont'd)

Personal Property Structures



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- This next series of slides will discuss types of debris and issues associated with removal of debris from private property.
- Destroyed homes will result in significant quantities of debris—C&D and contents. Building materials blown into roadways and yards may include lumber, shingles, and other building materials.
- Local ordinances should require homeowners to have their private contractors haul any debris resulting from the demolition and/or rebuilding process to be taken directly to the landfill and should be paid for from insurance proceeds, when available.

Notes:



Debris Types and Issues (Cont'd)

Personal Property

Mobile Homes



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- Mobile homes may present unique cleanup situations:
 - Mobile homes are normally treated as private property and should be removed under the owner's insurance proceeds.
 - However, in some instances, there will be a need to quickly install replacement mobile homes resulting in the damaged home debris being bulldozed to the right-of-way.
 - This will result in large quantities of mixed debris.

The metal frames, light metal porches, and outbuildings may be suitable for metal recycling efforts.

Notes:



Debris Types and Issues (Cont'd)

Personal Property

Furnishings



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- Household furnishings and personal effects will become debris as a result of many disasters
- If residents do not have sufficient time to move contents, as would be the case in tornadoes, flash floods, and earthquakes, the quantities of personal effects will be significant.
- Quantities increase when roofs are damaged during rain events.
- Household furnishings normally make up the second wave of debris that will come to the right-of-way.
- Rugs, furniture, and mattresses should be treated as mixed debris and taken directly to a landfill.

Notes:



Debris Types and Issues (Cont'd)

Personal Property

Household Hazardous Waste



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- Household Hazardous Waste (HHW) may result from flooding conditions, as well as from other disasters that result in damage to residences.
- HHW may be mixed in with personal property debris.
- Every effort should be made to segregate HHW from the debris stream at the curbside as these materials require special handling and disposal.
- HHW includes such items as:
 - Paint
 - Solvents
 - Cleaning supplies
 - Insecticides
 - Pool chemicals
 - Propane
 - Gasoline
 - Oils

Notes:



Debris Types and Issues (Cont'd)

Metals



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- Metal debris may include:
 - Roofing
 - Mobile homes
- Some metals might be suitable for recycling.

Notes:



Debris Types and Issues (Cont'd)

White Goods



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- White metals may include:
 - Refrigerators
 - Freezers
 - Washers
 - Dryers
- White goods, such as refrigerators, stoves, washers, dryers, etc., should be segregated and recycled if possible. Care must be exercised to ensure that refrigerants are removed from cooling units by a certified air-conditioning technician.

Notes:



Debris Types and Issues (Cont'd)

Mixed Debris



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- Debris becomes mixed by:
 - Uncontrolled collection and disposal
 - Disaster effects such as high winds from hurricanes and tornadoes
- Roadside debris piles often contain a mixture of debris types.
- Separation of the mixed debris is often not cost effective. Most often the debris is taken directly to the landfill.

Notes:



Debris Types and Issues (Cont'd)

Vessels/Boats



11:11PM

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Removal of boats and vessels requires coordination with the appropriate governing authorities; generally removal and disposal of vessels is the owner's responsibilities

Notes:



Vehicles



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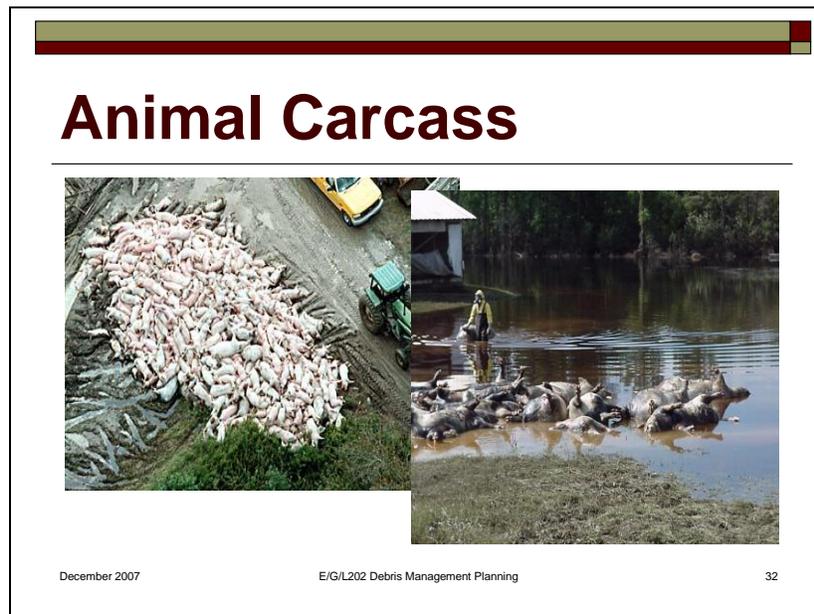
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- Disposal of vehicles has become a BIG issue in disasters.
- Removal and disposal of vehicles should be coordinated with the appropriate governing authorities.
- Removal and disposal of vehicles is generally the responsibility of the owner.

Notes:



Debris Types and Issues (Cont'd)



- Disposal of animal carcasses can be an issue in disasters, especially in floods.
- Often times, a storm will cause a farmer to not have access to the animals which can cause additional deaths.
- Farmers and/or animal owners should be responsible for the disposal of their animals, but when large numbers of animals are affected, it may be beyond the means of the farmer to properly dispose of them.
- Additionally, particularly in floods, animals may have washed into trees and onto public and private property. To determine ownership of these animals is often impossible.
- In a large-scale flood, wild animals will also be a problem for collection as well as disposal.
- Disposal of animals presents an environmental/health issue:
 - The health and safety of those conducting the cleanup, as well as the citizens at large, must be considered.
 - Long-term environmental impacts of disposal must be considered.
 - The traditional method for disposal is burying. However, for large numbers, this may present a health issue. Composting and incineration are also effective means of disposal, but must be evaluated against environmental regulations.

Notes:



Critical Debris Management Issues

Critical Debris Issues

- Types of potential disasters
- Estimated quantities and types of debris
- How it will be:
 - Collected
 - Stored
 - Reduced
 - Disposed

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- To effectively manage debris activities, it is important to identify and address critical debris issues, including:
 - What type of disasters should be planned for in this community?
 - How much and what types of debris can be generated in these events?
 - How will the material be collected, stored, reduced, and disposed of?

Notes:



- Additional considerations are provided on the next slide.

Critical Debris Management Issues (Cont'd)

Critical Debris Issues

- Identification of responsible agencies
- Capabilities of in-house resources
- Identification of work to be contracted
- Identification of applicable environmental and historic laws
- Requirements for FEMA funding

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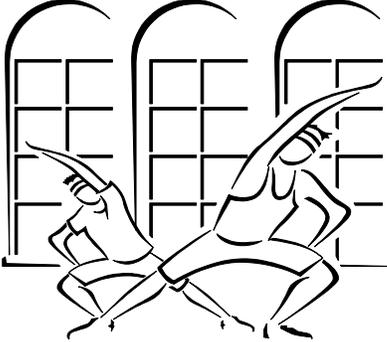
- Additionally, the community must identify how the work will be organized, performed, and managed:
 - Identify agencies available to assist in the debris efforts and what their responsibilities will be.
 - Identify the capabilities of in-house resources and how they can best be used.
 - Identify the types of work that should be contracted.
 - What types of contracts will be most appropriate for the type of work?
 - Identify the Federal, State, and local environmental and historic preservation laws that might apply to the anticipated work.
 - Identify the types of documentation that may be required to support FEMA funding.
 - In large disasters, Federal funding may be available through FEMA.
 - It is in the communities' best interest to develop their debris management strategy to consider FEMA requirements for funding.

Notes:



Critical Debris Management Issues (Cont'd)

Activity 1.1



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Activity 1.1: Debris Issue Assessment

- This activity will provide you with the opportunity to apply the teaching points covered in this unit.
- Turn to Activity 1.1 in your Student Manual, Volume II (Group Activity Materials).

Notes:



ACTIVITY 1.1: DEBRIS ISSUE ASSESSMENT

Participant Activity Instructions

You have 25 minutes to complete this activity. Respond to the following questions using the Matrix of Disasters and their Debris Types (Reference A) and the Disaster Intensity Scales for Hurricanes, Tornadoes, and Earthquakes (Reference B), as well as your personal disaster experience.

You can work with your group for this activity but everyone must record their responses below.

Participant Activity Scenario

You have been tasked with helping to prepare your community's Debris Management Plan. Your coastal community has a history of hurricane and tornado disasters and you are located along an earthquake fault line. You have been advised to plan for an F5 Tornado, a Category 4 hurricane, and an earthquake with an MMI (Modified Mercalli Intensity) of X.

Your community has a thriving tourism industry along the coast. There are several casinos and several more being constructed at this time. Most of the casinos have marinas. The beaches are the most popular in the State. The western portion of your community is predominated with poultry farms located adjacent to the Catfish River.

Participant Activity

Based on the information given in the above scenario, respond to the following questions.

1. What types of debris, to Public Facilities, would you anticipate from each of the three different types of disasters?
 - A. Hurricane, Category 4

 - B. Tornado, F5

 - C. Earthquake, MMI X

ACTIVITY 1.1: DEBRIS ISSUE ASSESSMENT

2. What types of debris, to Private Property, would you anticipate from each of the three different types of disasters?

A. Hurricane, Category 4

B. Tornado, F5

C. Earthquake, MMI X

3. List some common debris-related issues between the three types of disasters given.

4. What would be some unique debris-related issues for each of the three types of disasters?

A. Hurricane:

B. Tornado:

C. Earthquake:

Unit 2: Debris Quantity Forecasting and Estimating



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1

Unit Introduction

- The purpose of this unit is to present various debris forecasting and estimating techniques including various tools and rules of thumb to assist the Debris Manager in planning for large-scale debris operations.
- The determination of the quantity and type of debris is critical to debris management. Debris contracting, the management of Debris Management Sites, and the possible need for State and Federal Resources (covered in following units) will require a reasonably accurate estimate of debris quantities.

Notes:



Objectives

- 2.1 Discuss the importance and differences between debris forecasting and estimating
- 2.2 Forecast and estimate the quantity and mixture of debris using various techniques
- 2.3 Address debris forecasting and estimating issues in debris planning

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Unit Objectives

At the end of this unit, you will be able to:

- Discuss the importance and differences between debris forecasting and estimating.
- Forecast and estimate the quantity and mixture of debris using various techniques.
- Address debris forecasting and estimating issues in debris planning.

Notes:



Introduction (Cont'd)

Forecasting vs. Estimating

Debris Forecasting

- Pre-disaster plan development

Debris Estimating

- Post-disaster plan implementation

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- Debris forecasting is normally a pre-disaster technique used to *predict* debris quantities.
 - Certain planning assumptions must be made concerning the type and magnitude of debris-generating events.
 - For instance, the plan would assume that a specific type of event, such as a Category 4 hurricane, will affect the community with resulting large quantities of vegetative and construction and demolition debris.
 - Or, the plan may assume a range of debris-generating events from small floods and tornadoes to similar catastrophic events.
 - Debris Forecasting can also be used to determine the type and number of stand-by contracts required to remove and dispose of the predicted debris.
- Debris estimating is normally used in a post-disaster situation to establish a reasonable **estimate** of the actual debris quantities and mix.
 - Debris estimates will be used to determine a community's actual capability to handle the situation.
 - Debris estimates will be used to determine the actual need for Debris Management Sites, contracts, and landfill space requirements.

Debris Forecasting Techniques

Debris Forecasting Techniques

- Historical Analysis
- Community-based risk analysis
- Computer-based prediction analysis

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- There are three basic techniques that are used for debris forecasting:
 - An analysis of prior debris-generating events can be conducted for your community or a similar community. With this analysis completed it may be possible to plan for effective response to similar type events. However, because the event may have been limited in scope or experienced debris staff are no longer available, this method has severe limitations.
 - More commonly, a community-based risk analysis is completed to determine the types and quantities of debris generated by various events. This analysis is then used as a critical component of the debris management plan.
 - Computers can be used for both of the first two techniques to perform calculations and present the analysis. However, there are a range of computer-based prediction models available to perform some of the more routine calculations, use a community's Geographical Information System (GIS) and plan for any number of event scenarios.
 - When these three techniques are combined, a very effective analysis can be completed.

Notes:



Debris Forecasting Techniques (Cont'd)

Forecasting

Historical Analysis

- Analyze prior events
- Interview staff
- Review changes in conditions:
 - Land use changes
 - Landfill capacity changes
 - Response capability of community
 - Laws and regulations

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- In order to complete an historical analysis of prior debris events, some basic information should be gathered:
 - Prior event(s) should be selected from your community or from communities who have experienced the type of disaster you have forecasted for your community.
 - Key staff members responsible for debris activities should be interviewed to determine procedures that were effective and those that were not.
 - An analysis of any effect in changes to the way your community would be able to respond to such events as:
 - Land use changes that may increase or decrease the types of debris generated.
 - A significant decrease in your landfill capacity or more current landfill regulations may have a very severe impact.
 - A increase or decrease in your community's engineering or solid waste department staff could also make a difference in your response capability.

Notes:



Debris Forecasting Techniques (Cont'd)

Forecasting

Community-Based Risk Analysis

- Use maps to indicate areas of similar land use
 - Urban, industrial, rural, mixed
- Develop a representative sample of debris quantities of each area
- Project debris quantity estimate for each area

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- A simple method can be used to systematically forecast the type and quantity of debris for a community.
 - First, obtain detailed maps of your community and highlight them with an indication of the type of land use in each area, such as urban, industrial, rural, and mixed. This area separation will make your analysis easier as similar land use areas can be assumed to have similar debris types.
- For instance: parks, orchards, groves, nurseries, and tree-lined streets will have similar debris quantities based on an acreage or mileage basis.
- Commercial and industrial areas tend to have heavy amounts of construction and demolition type debris.
- Residential areas can be a combination of vegetative and construction and demolition debris.
- Second, develop a representative sample of the debris in each area.
- Debris quantities can be estimated using the following guidelines:
 - One-story house = Volume in cubic yards times 0.33
 - Volume in cubic yards personal property from flooded home without basement = sq footage of structure times .02
 - Single-wide mobile home = 290 cy.
- The terms light, medium, and heavy are somewhat subjective, but the general guide is: If there is very light vegetation covering the house, yard or driveway, use the light column. If there is a canopy of trees covering the house, use the heavy column. Use the medium column for everything else.

- Third, project the sampling of debris for each area and provide a total of the amount and type of debris for each area. The grand total of all these calculations will provide you with an estimate useful for planning purposes.
- Note that this type of debris forecasting is not an exact science. Broad assumptions and wide-scale projections must be made throughout the process. However, even with its inaccuracies, the resulting quantity estimate can be very useful in completing the next phases of the planning process, such as selecting Debris Management Sites or developing contracts.

Notes:

Debris Forecasting Techniques (Cont'd)

Forecasting

Computer-Based Prediction Analysis

- Types of models
 - USACE
 - Private industry

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Computerized modeling programs have been developed to provide reasonable debris predictions for communities under various disaster types.

Notes:



Debris Forecasting USACE Model – Manual

- Formula: $Q = C(H)(V)(B)(S)$
 - Q = Volume of debris in cubic yards
 - C = Storm category factor
 - H = Number of households
 - V = Vegetative characteristic
 - B = Commercial/business/industrial use multiplier
 - S = Precipitation multiplier

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U.S. Army Corps of Engineers (USACE)

Background

- The USACE Emergency Management staff developed a modeling methodology designed to forecast potential amounts of hurricane (and tornado)-generated debris—the first of its kind.
- This model was initially based on actual data from Hurricanes Frederic, Hugo, and Andrew.
- This model considers the category of Hurricane 1 through 5, and assigns a volume of debris based on single-family homes. Multipliers are then used to compensate for other factors, such as tree cover, commercial density, and precipitation. The formula can be put into a spreadsheet and calculations made.
- The model has a predicted accuracy of plus or minus 30 percent.
- However, the model is limited in that it will only generate a gross debris forecast.
 - Since hurricanes do not cause uniform damage over a given area, the USACE model is of little use after an event. It would be very time consuming and difficult to identify the exact areas damaged and the number of homes affected.
 - The USACE has a continuing ongoing effort to improve this model.
- The USACE is considering expanding the model for flood events.

Formula

- The following is the formula on which the analysis is based, along with a definition of each. Refer to the Debris Management Guide for a more detailed description of each of these.

$$Q = C(H)(V)(B)(S)$$

- Q is the calculated volume of debris in cubic yards.
- C is a factor based on the category of hurricane, 1 through 5.
- H is the number of households involved. If no better information is available, divide the population of the area by 3.
- V is the vegetative characteristic: 1.1 for light, 1.3 for medium, and 1.5 for heavy.
- B is a multiplier that takes into account areas that are not solely single-family residential. Built into this factor is the offsetting commercial insurance requirement.
- S is a storm precipitation multiplier that takes into account the fact that storms that have heavy precipitation will generate more vegetative debris because of the uprooting of complete trees.

Notes:

Debris Forecasting Techniques (Cont'd)

Debris Estimating Techniques

- Ground measurement
- Aerial photography
- GIS
- Combination of techniques

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- There are many different ways to estimate debris.
- Being creative with the tools, techniques, and information available to you can bring the best results.
- The following slides present various techniques and ways of using them alone and in combination with other techniques to provide the desired product.

Notes:



Debris Estimating Techniques (Cont'd)

Estimating Roadside Debris Piles



Mixed Debris

C&D Debris



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- There are many things to consider when estimating debris:
 - First consideration: type of debris, for example:
 - vegetative
 - construction and demolition
 - mobile homes
 - a mix of different things
 - Identify handling requirements, for example, if you will need to separate it.
- For FEMA funding, determine if the debris eligible or what portion is eligible.
- From this slide, you can see various ways debris will present itself.

Notes:



Debris Estimating Techniques (Cont'd)

Ground Measurements

- Equipment
- Estimating aids:
 - Defining debris area
 - Formulas
 - Tables

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- It is important to have the correct tools, aids, and information in place when doing estimates. Debris estimates are only as good as the basic information used to create them.
- Ensure that necessary equipment is available, including:
 - Digital (preferred) or Polaroid camera
 - 100-foot tape or roll-off wheel
 - Calculator, notepad, sketchpad
 - Maps of area
 - Aerial photographs (preferably before and after the disaster)
 - Dedicated vehicle and mobile communications
- Once the equipment is in place, consider the area to be estimated and the manner in which the area should be divided (sectors). Debris estimating can be expedited by dividing the community into sectors based on any of the following:
 - Type of debris: woody, mixed, or construction material
 - Location of debris: residential, commercial, or industrial
 - Land use: rural or urban
- Remember that however you define your area, you must be consistent with your system and keep detailed notes on how, where, and what method you used for your estimates. These notes must be well documented and maintained for future reference.
- Further discussion on estimating formulas and tables is provided in the following slides.

Debris Estimating Techniques (Cont'd)

Debris Estimating Formulas

- One-story building:

$$\frac{L' \times W' \times H'}{27} = \text{___ CY} \times .33 = \text{___ CY}$$
- Mobile homes:

$$\frac{L' \times W' \times H'}{27} = \text{CY}$$
- Debris piles:

$$\frac{L' \times W' \times H'}{27} = \text{___ CY}$$

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- Estimating Aids—Buildings: The following information will assist you in determining the amount of debris from destroyed buildings, homes, and debris piles:

- One-story building formula:

$$\frac{L' \times W' \times H'}{27} = \text{___ CY} \times .33 = \text{___ CY}$$

- One-story house formula:

$$\frac{L' \times W' \times 8'}{27} = \text{___ cubic yards} \times 0.33 = \text{___ cubic yards of debris}$$

(The 0.33 factor accounts for the “air space” in the house)

- Mobile homes formula:

$$\frac{L' \times W' \times H'}{27} = \text{CY}$$

(The 0.33 factor is not applied to mobile home calculations due to their compact construction)

- Debris piles:

$$\frac{L' \times W' \times H'}{27} = \text{___ CY}$$

- Reminders: The following reminders may be of assistance when performing debris estimates:

- Look beyond the curb into side and backyards and at the condition of the homes. Most debris in these areas will eventually move to the curb.

- Wet storms will produce more personal property debris (household furnishings, clothing, rugs, etc.) if roofs are blown away.
- Look for hanging debris such as broken limbs after an ice storm.
- Flood-deposited sediment may be compacted in place. Volume may increase as debris is picked up and moved.
- Using aerial photographs in combination with ground measurements will help determine if there are any voids in the middle of large debris piles.
- Treat debris pile as a cube, not a cone, when performing estimates.

Notes:

Debris Estimating Techniques (Cont'd)

Debris Estimating Table				
Vegetative Cover Multiplier (Yard Waste)				
Typical House	None	Light (1.1)	Medium (1.3)	Heavy (1.5)
1000 SF.	200 cy	220 cy	260 cy	300 cy
1200 SF.	240 cy	264 cy	312 cy	360 cy
1400 SF.	280 cy	308 cy	364 cy	420 cy
1600 SF.	320 cy	352 cy	416 cy	480 cy
1800 SF.	360 cy	396 cy	468 cy	540 cy
2000 SF.	400 cy	440 cy	520 cy	600 cy
2200 SF.	440 cy	484 cy	572 cy	660 cy
2400 SF.	480 cy	528 cy	624 cy	720 cy
2600 SF.	520 cy	572 cy	676 cy	780 cy

Formula for one story structure: $\frac{\text{square feet} \times 8 \text{ feet}}{27} \times .20 \times \text{VCM} = \text{cy}$

This chart and calculations are inclusive of the structure and contents

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- The table in the slide can be used to estimate debris quantities for a totally destroyed typical home.
- A vegetative debris multiplier is also included.
- Amount of personal property (as debris) from average flooded residence without a basement: 25-30 cy.
- Amount of personal property (as debris) from average flooded residence with a basement: 45-50 cy.
- Remember, these values are for a single-story home (please note the height used in the formula is 8 feet).
- If the structure had blown away or you did not know the square footage of the building, measure the area of the floor slab if still in-place and then use the table. Similarly, once a square footage has been generated from a floor slab, multiply by the number of floors, if that can be determined, from the homes in the surrounding neighborhood.
- As far as the vegetative cover multiplier goes, one just has to develop a sense of what heavy vegetation is. A new home could be considered to have had little or no vegetative cover, for instance.

NOTE: For multiple-story buildings, multiply the debris from one story by the number of stories; however, the vegetative cover should be determined by using the multiplier from a one-story facility.

Debris Estimating Techniques (Cont'd)

Debris Forecasting USACE Flood Debris Model

- Used to calculate debris quantity from a flood event only when the structure is not destroyed.
- Formula: Square footage x .02 = cubic yards of debris
- 2400 sq. ft. x .02 = 48 cubic yards

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Notes:



Debris Estimating Techniques (Cont'd)

USACE Formulas

- The USACE formulation model for calculating:
 - Loads to haul and times
 - Number of sectors
 - Reduction rates
 - Manpower for monitoring

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1. The USACE has a formulation guideline used to calculate.
 - The reduction time and volume
 - Area needed for a sector
 - Loads moved within the sector
 - The number of trucks it takes to haul a given number of cubic yards to a landfill or Debris Management Site
2. The following slides (2.17-2.21) will briefly cover the application of the USAC formulation guidelines.

Notes:



USACE Formulas

- Loads to haul and times

- 120-Day mission (Example)
- 2,000,000 cy per sector and one TDSR per sector
- A 4 C.Y. loader will load a 20 C.Y. truck in 10 min.
- Average haul distance is 15 miles
- 12-hour work day

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USACE Formulas

- Loads to haul and times

- Calculations:
- Loading = $60\text{min} / 10\text{min/load} = 6$ loads per hour
- Assuming 1 hr for lunch and 1 hour down time,
- $12 - 2 = 10$ hrs x 6 = 60 loads per day per loader
- 60 loads x 20 cy per load = 1200 cy per day per loader
- Truck time, 15-mile haul
- = 30 min travel, 15 unloading, 25 min return = 70 min,
70/10 min/load = 7 trucks, use 8
- = 8 trucks per loader

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USACE Formulas

- Loads to haul and times

- Calculations:
- Loading = $60\text{min} / 10\text{min/load} = 6$ loads per hour
- Assuming 1 hr for lunch and 1 hour down time,
- $12 - 2 = 10$ hrs $\times 6 = 60$ loads per day per loader
- 60 loads $\times 20$ cy per load = 1200 cy per day per loader
- Truck time, 30-mile haul
- = 50 min travel, 15 unloading, 45 min return = 110 min,
 $110/10$ min/load = 11 trucks,
- Use $12 = 12$ trucks per loader

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USACE Formulas

- Loads to haul and times

- Calculations:
- 1200 cy per day per loader
- 8 trucks per loader
- $2,000,000$ C.Y. / 120 days for mission =
 $16,666$ C.Y./day
- $16,666$ C.Y./ $1200 = 13.8$ or 14 loaders
- 14 loaders $\times 8$ trucks/loader = 112 trucks

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USACE Formulas – Reduction Rates

- 12-hour work day
- Incineration rate = 160 C.Y. per hour, 24-hour operation
 - $160 \times (24-5)19 \text{ hrs/day} = 3000 \text{ C.Y./day}$
- Grinding rate = 180 C.Y. per hour, 10-hour operation
 - $180 \times 10 = 1800 \text{ C.Y./day}$

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USACE Formulas – Monitoring Manpower

Manpower:

- One inspector per loading operation = 14
- Six inspectors per TDSR
 - One - Site Team Leader
 - Two - Tower Operations
 - One - Reduction Operations
 - Two - Night Shift $\underline{= 6}$
20/zone

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Debris Estimating Techniques (Cont'd)

Mobile Home Park Debris Estimating

Typical single
wide = 290
cubic yards

Typical double
wide = 415
cubic yards



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Typical quantities for mobile homes:

- Single-wide mobile home = 290 cy of debris
- Double-wide mobile home = 415 cy of debris

Notes:



Debris Estimating Techniques (Cont'd)

Units of Measure

- Volumetric (Cubic Yards)
- Weight (Tons)

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Units of measure can be done in many ways. In most cases, measurements are made by volume (cubic yards) or weight (tons).

- **Volumetric (cubic yard):** Cubic Yard (cy) measurements are used to determine the unit price of debris (woody, mixed, or C&D) transported to a Debris Management Site or permanent landfill.
- **Weight (tons):** All trucks must have a certified tare weight (empty) established if payments are going to be made based on certified scale net weight receipts. Field Debris Monitors will be required to spot check trucks after dumping to see if they are still at their tare weight.
 - Note: Gross weight – tare weight = net weight.

Notes:



Debris Estimating Techniques (Cont'd)

Approximate Conversions

Construction and Demolition (C&D)

- CY of C&D debris to tons—divide by 2
- Tons of C&D to CY—multiply by 2

Woody Debris

- CY of hardwoods to tons—divide by 4
- Tons of hardwoods to CY—multiply by 4
- Tons of softwoods to CY—multiply by 6

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- The following are rules of thumb. It will be necessary to do a field test to verify the makeup of the debris for your area and disaster type.
- When developing cubic yard (cy) measurements, divide cubic feet by 27.
- When converting from cy to tons, remember to use the correct factor:
 - Use 2 if converting for C&D material.
 - Use 4 if converting for woody material.
- Rules of thumb:
 - 15 trees, 8 inches in diameter = 40 cy (average)
 - Root system (8'-10' diameter) = may require one flatbed trailer to move
 - To convert cy of C&D debris to tons, divide by 2
 - To convert tons of C&D debris to cy, multiply by 2

Notes:



Debris Estimating Techniques (Cont'd)

Estimating Using Aerial Photography



Tornado Damage

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- Damage estimates can be made from available aerial photographs. The local newspaper supplied the above photograph.
- To estimate debris using a photograph such as this:
 1. Select an object in the photograph for which the length can be reasonably estimated, such as the truck.
 2. Measure the truck in the foreground and estimate its length at 25 feet.
 3. Apply that length to the intact houses to estimate the approximate length and width of each house. Calculate the approximate square footage by multiplying the length times the width. If you have houses of differing sizes, measure several and then calculate an average square footage.

Notes:



Debris Estimating Techniques (Cont'd)

Estimating Using Aerial Photography



Tornado Damage

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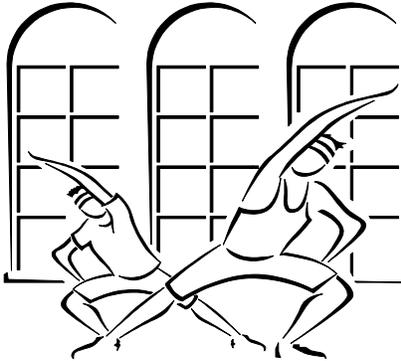
27

- This is an example of high altitude aerial photography.
- If you know the approximate square footage of the homes in the picture, you can count the driveways and compute the estimated cubic yards of mixed debris using a tornado debris conversion table.

Notes:



Review Activity 2.1 – Debris Forecasting and Estimating



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Activity 2.1: Debris Forecasting and Estimating

- Turn to Activity 2.1 in your Student Manual, Volume II (Group Activity Materials).

Notes:



ACTIVITY 2.1: DEBRIS FORECASTING AND ESTIMATING

Participant Activity Instructions

You have been given the following disaster scenario and county land use data.

Each group will compile its responses on the chart paper.

You have 40 minutes to complete this activity. You may work in your group to complete this activity.

Participant Activity Scenario

You are the Public Works Director for a community in Gotham County. Under the County Disaster Response Plan, you are designated as the Debris Manager during disaster situations.

The County Emergency Manager has assembled several local Public Works representatives for a 1-day tabletop exercise to test the county's debris management planning and readiness capabilities. The County Commission has decreed that the county will have a plan in place to respond to a Category 3 hurricane.

Since you have had experience in disaster-related debris management activities, the County Emergency Manager has asked that you estimate the quantities and mix of debris that can be anticipated in the county from a Category 3 hurricane.

Tabletop Disaster Scenario

You are to assume, for debris forecasting purposes, that a Category 3 hurricane is anticipated to make landfall at Gotham County within 24 hours. Landfall is expected under high tide conditions. It is anticipated that there will be high winds, tornadoes, and heavy rainfall associated with this storm. The County Emergency Manager states that it is anticipated that it will be difficult to convince elderly residents to leave the coastal areas of Gotham County.

Gotham County Demographic Profile

Gotham County is the largest (by area) and fastest growing coastal county in the State of Franklin. The county has identified two major land use zones that support its economic growth:

- Zone I: The coastal area of the county, especially around the city of Poplar Grove, is beginning to develop as a casino beach resort area. Outside the city, there are several small older beach communities with their own tourist industries. Away from the coast is very rural with timberland predominating. Most of the county's critical facilities—power, well fields, waste waster, water plants are located in this zone.

ACTIVITY 2.1: DEBRIS FORECASTING AND ESTIMATING

- Zone II: The remainder of the county has several thriving “silicon valley” type businesses in a recently constructed research park. Currently, the park is at 35% build-out. In response to new businesses located at the park, there has been subdivision growth in areas that were formerly open agriculture, chicken farm, and pastureland areas. Suburbia is a large planned urban development which is at 20% build-out of single-family homes and 10 % build-out of office space, stores, and schools.

There are a large chicken farms to the west, but the predominance of floodplain areas has slowed the suburban development of this area.

Gotham County is bisected by the Deep River that discharges into the Atlantic Ocean at the city of Poplar Grove. There is an estuary near the outfall of Deep River, which is known for its marine and bird life.

The County Emergency Manager estimates that 3,000 homes and 500 businesses are at risk to be without electricity; natural gas, water, and phone service for a storm of this magnitude.

The county had recently initiated bond proceedings to construct a new landfill on recently purchased land. The county’s municipal solid waste landfill has 6 years of capacity remaining.

The county has a Public Works compound located in Zone I just north of Poplar Grove City limits and another near the landfill south of Deep River.

It has been at least 7 years since Gotham County has been hit by a hurricane.

ACTIVITY 2.1: DEBRIS FORECASTING AND ESTIMATING

Participant Activity

- (A) Predict the total quantity of debris that Gotham County can anticipate from a Category 3 Hurricane. Use the USACE Hurricane Debris Estimating Model (Step 1) found in *Public Assistance Debris Management Guide*.**

Calculate the total Quantity of Debris	Zone I	Zone II
Households (H)	3,100	1,800
Category 3 storm factor (C)	26	
Vegetation multiplier (V)	Heavy (1.5)	
Multiplier for commercial density (B)	Heavy (1.3)	
Multiplier for wet storm (S)	1.3	
Q (cubic yards of debris)= HxCxVxBxS	Q = 204,321	
Grand total of Debris (Zone I & II) =		

- 1. The number of households was given in this example. Where would you go to obtain this information if it wasn't provided?**

- 2. Justify the vegetation multiplier that you used for Zone II.**

- 3. Justify the commercial density multiplier that you used for Zone II.**

- 4. Justify the wet storm multiplier that you used for Zone II.**

ACTIVITY 2.1: DEBRIS FORECASTING AND ESTIMATING

(B) Determine the mix of debris that can be anticipated from a Category 3 hurricane. Again, reference the USACE Hurricane Debris Estimating Model (Step 3) in *Public Assistance Debris Management Guide*.

Calculate the Mix of Debris Anticipated, Cubic Yards	Zone I	Zone II
Total Debris Quantity	204,321	
Total debris quantity (Zones I & II)		
Vegetative - clean woody debris	61,296	
Total C&D	143,025	
Mixed C&D: burnable	60,071	
Soil	7,151	
Metals	21,454	
Landfilled	54,350	
Grand Total Vegetative (Zones I & II)		
Grand Total C&D (Zones I & II):		

1. Why is this information important in the debris management and planning process?

Unit 3: Special Considerations



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Unit 3: Introduction

- This unit provides:
 - A brief review of the environmental and historic preservation laws, regulations, and executive orders that can be triggered by debris-related activities.
 - A discussion of how these laws, regulations, and executive orders can apply to a community's debris-related activities.
 - A discussion of the general roles and responsibilities of the community to ensure compliance with environmental and historic preservation laws, regulations, and executive orders.
- This unit provides the background necessary to understand the importance of environmental and historic preservation issues in the debris-related concepts introduced in later units of this course.

Notes:



Objectives

- Identify regulatory compliance in debris management.
- Explain consequences of compliance/non-compliance with regulations and policies.
- Address issues as they relate to debris management.

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At the end of this unit, you will be able to:

- Explain why environmental and historic preservation issues must be considered in disaster debris-related activities.
- Identify potential environmental and historic preservation issues related to debris-related activities.
- Address environmental and historic preservation considerations in debris planning.

Notes:



Introduction (Cont'd)

Why Compliance is Important

- Significant consequences
- Legal requirements at several levels
 - Federal
 - State
 - Local / Tribal



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- There are significant consequences for non-compliance which include:
 - Legal actions—based on violation of specific laws, non-compliance with processes, and adverse effects of debris-related activities.
 - Project delays—these usually occur when you can least afford them. They may result from such things as law suits, restraining orders, and permitting requirements.
 - Negative publicity—this may result from stories about violations or improper procedures, impacts that could have been avoided, or delays that resulted from either of these.
 - In some instances, it may hamper the effectiveness of other recovery efforts.
 - Often a community, although familiar with its own regulatory requirements, is surprised to find out that there are Federal regulatory requirements after the President declares an emergency or major disaster. These requirements are not implemented at FEMA’s discretion but are mandated by Congress.
 - If certain laws are violated or procedures not followed, Federal funding may not be available.

Notes:



Introduction (Cont'd)

Community Responsibilities

- Be familiar with applicable laws, regulations, and executive orders
- Be familiar with how debris activities can trigger compliance

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- Compliance issues with applicable laws, regulations, and executive orders should be addressed in the Debris Management Plan.
- Refer to Chapter 4 of the *Public Assistance Guide*.
 - Although the Federal laws, regulations, and executive order information presented in this document is not specific to debris activities only, the Guide is an excellent reference for general information about the typical Federal laws, regulations, and executive orders that could be triggered.
- Refer to the *Public Assistance Policy Digest*.
 - The Policy Digest can be used to reference general information about the various Federal laws, regulations, and executive orders that could apply to debris activities.
- Although these documents refer only to Federal laws, regulations, and executive orders, your own State and communities will often have parallel laws and regulations. For instance:
 - Endangered Species Act (ESA): Although this is a Federal law implemented by the U.S. Fish and Wildlife Service, States also have a State Endangered or Threatened Species list and law. Compliance is required at both the Federal and State level.
 - Clean Water Act (CWA): Although this is a Federal law implemented by the U.S. Army Corps of Engineers (USACE), States usually have their own State laws and requirements regarding water quality. If so, compliance is required at both the Federal and State levels.

Application to Debris Activities

State or Local Emergency vs. Federal Declaration

State or Local Emergency

- Community responsible for compliance (permitting)

Federal Declaration

- FEMA must consider impacts of funding action
- Community responsible for compliance (permitting)

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State or Local Emergency

- The community is responsible for compliance (permitting) with applicable State and local laws, regulations, and ordinances as they affect debris-related activities.
- It is important to identify applicable State and local laws in the debris management planning process and to identify what exemptions or expedited permitting procedures could apply to the intended debris-related activities.

For instance:

- If Debris Management Sites are to be pre-identified in the Debris Management Plan, then potential site locations must be reviewed by the State Historic Preservation Office for potential impacts to cultural resources. Be sure to document compliance clearances as necessary in the Debris Management Plan (possibly in an appendix of the plan) so they are readily referenced if the plan must be implemented.
- Even though a Federal disaster declaration has not been issued, the community will still have to comply with certain applicable Federal laws, regulations, and executive orders.

For instance:

- ESA
- CWA
- CAA—may be triggered if burning of debris is proposed. In general, States have been delegated the authority for permitting under this act by the EPA.

Application to Debris Activities (Cont'd)

- Resource Conservation and Recovery Act (RCRA).
- These and additional Federal laws, regulations, and executive orders and how they apply to debris-related activities will be covered in the next few slide.
- These laws, regulations, and executive orders and their permitting procedures or exemptions should also be addressed in the Debris Management Plan.

Federal Declaration

- In the event that a Federal Declaration is granted, the State, local, and Federal issues identified above are still applicable. Since Federal funding will now be used for the community's debris-related activities, additional Federal compliance requirements will apply.
 - In addition to the community obtaining the appropriate compliance (permitting) clearance for their debris-related projects, FEMA must also obtain and document clearance for their funding actions. FEMA is required to consider impacts to environmental and historical resources **BEFORE** making Federal funding available.
 - Now that Federal funding is involved, additional Federal laws, regulations, and executive orders must be addressed. For instance:
 - National Environmental Policy Act (NEPA): This act was introduced in the previous activity.
 - NEPA is a procedural law. Each agency must have procedures to comply with NEPA.
 - NEPA requires Federal agencies to follow a specific planning process, which
 1. Requires that agency decision makers are fully informed about the environmental consequences of their decision to fund or conduct an action;
 2. Mandates that the public be informed of the proposed actions, the consequences of those actions, and the ultimate agency decision; and
 3. Must be done **BEFORE** work is initiated.
 - In other words, for projects to which NEPA applies, the law requires that before a Federal agency can fund or implement an action, agency decision-makers must study the impacts that the proposed action and alternatives will have on the environment, and make that information available to the public.
 - Certain debris activities are exempt from the NEPA documentation process. This is called a Statutory Exemption (STATEX).
 - Debris activities that can be granted a STATEX include debris clearance, debris removal to a permitted or certified landfill, debris hauling on improved rights of way, demolition of unsafe structures (although a review under the National Historic Preservation Act (NHPA) (may be required).

Application to Debris Activities (Cont'd)

- Debris activities that will require additional environmental review under NEPA include new landfills, new staging areas, or Debris Management Sites.
- Only FEMA can make this determination.
- Another Federal executive order that must be addressed if a Federal Declaration is issued is Environmental Justice.
- A discussion on how debris-related activities may trigger Federal laws, regulations, and executive orders will be covered in the following slides.
- In order for FEMA to initiate Federal compliance, potential environmental and historic preservation issues must be first identified. You will be asked to provide information to assist in completing the *Special Considerations Questions* form (*a copy of this form is included at the end of this unit*).
 - Turn to the end of the unit and briefly review the form; identifying typical questions that would apply to debris-related activities.
 - This form must be completed for every debris-related project that will receive Federal assistance (and for all other projects as well).
- Communities should establish environmental and historic contacts in their Debris Management Plan and should identify a contact to work with FEMA on environmental and historic issues as they relate to debris-related activities.

Notes:



Special Considerations Compliance

- Environmental
- Historic
- Insurance
- Contracting

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In order to receive Federal funding for debris removal activities, all projects must comply with the FEMA Public Assistance Regulations and Policies. In addition the projects must comply with all Federal, State, and Local Environmental and Historic Preservations laws.

Notes:



Application to Debris Activities

Application to Debris Activities

Consider regulatory compliance issues during:

- Clearance
- Collection and Removal
- Demolition
- Debris management site operations
- Volume reduction
- Final disposal

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- What are some examples of potential environmental and historic preservation issues for several of the following debris-related activities:
 - Clearance
 - Collection and removal
 - Demolition
 - Debris Management Site development and operations
 - Volume reduction
 - Final disposal

Notes:



Application to Debris Activities (Cont'd)

Environmental

- Clean Air Act
- Clean Water Act
- Floodplain & Wetlands (E.O 11988 & 11990)

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-
- Clean Air Act—Stipulates the protection and enhancement of the Nation’s air resources
 - Clean Water Act—Regulates discharges of pollutants into waters of the United States
 - Floodplain and Wetlands—Requires Federal agencies to preserve or restore natural benefits of floodplains/wetlands

Notes:



Application to Debris Activities (Cont'd)

Environmental

- Resource Conservation and Recovery Act
- Endangered Species Act
- Environmental Justice (EO 12898)
- Coastal Barrier Resources Act

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- Resource Conservation and Recovery Act—Requires safe disposal of waste materials, and promotes the recycling of waste materials.
- Endangered Species Act—Requires that all entities consider the effects that their actions may have on threatened and endangered species.
- Environmental Justice—Each Federal agency must make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health, environmental, economic and social effects of its programs, policies, and activities on minority and low-income populations.
- Coastal Barrier Resources Act—Restricts Federal assistance that encourages development so that damage to property, fish, wildlife, and other natural resources associated with coastal barrier islands is minimized.

Application to Debris Activities (Cont'd)

Environmental

National Environment Policy Act

- Directs federal agencies to thoroughly assess the environmental consequences of major federal actions significantly affecting the environment.
- Exempts certain debris operations from the NEPA review process. Such operations generally include debris removal, clearance of roads, and demolition of damaged structures

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Historic

National Historic Preservation Act

- Requires that Federal agencies take into account the effects a project will have on historic resources

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National Historic Preservation Act—Damage to cultural resources and Historic sites

Notes:



Application to Debris Activities (Cont'd)

Stafford Act

Insurance –Duplication of Benefits

“No entity will receive assistance for any loss for which financial assistance has already been received under any other program, or from insurance, or from any other source.”

(44 CFR206.226a-1)

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The instructor will briefly review the following slides to emphasize that insurance proceeds for debris removal/disposal activities must be considered before FEMA funds can be provided.

Notes:



Application to Debris Activities (Cont'd)

Stafford Act

Contract Procurement (44CFR Part 13)

- Must comply with Federal, State and local procurement processes
- Must meet or exceed all Federal contract requirements
- Must procure contracts in a manner that will provide full and open competition

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State and local governments must adhere, at a minimum, to the Federal procurement standards. State and local procurement laws must also be complied with when soliciting for debris removal contracts.

If the State and local procurement process does not meet or exceed the Federal procurement standards outlined in CFR Part 13.36, FEMA cannot provide reimbursement.

Notes:



Activity 3.1 – Self-Test



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Activity 3.1: Self-Test—Federal Environmental and Historic Preservation Laws, Regulations, and Executive Orders.

- This activity will provide you with the opportunity to assess your understanding of Federal Environmental and Historic Preservation Laws, Regulations, and Executive Orders.
- Turn to turn to Activity 3.1 in the Student Manual, Volume II (Group Activity Materials).
- Instructor will provide instructions using the Instructor Guide, Volume II (Group Activity Materials) information and will indicate the time for completion.

Notes:



**ACTIVITY 3.1: SELF-TEST—FEDERAL ENVIRONMENTAL AND HISTORIC
PRESERVATION LAWS, REGULATIONS,
AND EXECUTIVE ORDERS**

Participant Activity Instructions

You have 25 minutes to complete this activity. You may work in your group to discuss the issues and use all available reference materials (*Public Assistance Guide* or the *Public Assistance Policy Digest/Appendix*), but each participant must complete his/her own answer sheet. Each group must be prepared to discuss its responses with the class upon completion.

Participant Activity Scenario

This activity is not part of the course disaster scenario.

Participant Activity

1. Match the following Federal Laws with their Objectives and its designated letter (A, B, C, etc.) from the next page. Where requested, provide a document reference and page number, which supports your choice.

Federal Law	Objective/Purpose
Clean Air Act	
Clean Water Act	
Floodplains & Wetlands (E.O. 11988 & 11990)	
Resource Conservation & Recovery Act	
Endangered Species Act	
Environmental Justice (E.O. 12898)	
National Environmental Policy Act	
Coastal Barriers Resources Act	
National Historic Preservation Act	

**ACTIVITY 3.1: SELF-TEST—FEDERAL ENVIRONMENTAL AND HISTORIC
PRESERVATION LAWS, REGULATIONS,
AND EXECUTIVE ORDERS**

Objectives

<p>A. Requires that Federal agencies are fully informed about the environmental consequences of their decision to fund or conduct an action; and mandates that the public be informed of the decision</p>	<p>B. Requires safe disposal of waste (especially hazardous materials) and promotes recycling</p>	<p>C. Ensures that Federal agencies consider the effects that their actions may have on threatened and endangered species</p>
<p>D. Restrict Federal assistance that encourages development so that damage to property, fish, wildlife, and other natural resources associated with coastal barrier islands is minimized</p>	<p>E. Required Federal agencies to preserve or restore natural benefits of floodplains/wetlands</p>	<p>F. Requires that Federal agencies take into account the effects a project will have on historic resources</p>
<p>G. Requires protection and enhancement of the Nation's air resources</p>	<p>H. Requires Federal agencies to evaluate actions for disproportionately high and adverse effects on minority or low-income populations</p>	<p>I. Regulates the discharge of pollutants to nations, rivers, lakes, estuaries and coastal waters, and dredging and filling in wetlands and waters of the United States</p>

Activity 3.2 – Environmental and Historic Preservation Scenario Review



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Activity 3.2: Environmental and Historic Preservation Scenario Review.

- This activity will begin to provide you with the opportunity to apply the teaching points covered in this unit.
- Turn to Activity 3.2 in Student Manual, Volume II (Group Activity Materials).

Notes:



ACTIVITY 3.2: ENVIRONMENTAL AND HISTORIC PRESERVATION SCENARIO REVIEW

Participant Activity Instructions

You have 30 minutes to complete an assessment of the two given scenarios. Review the scenarios and complete the provided Environmental and Historic Preservation Matrix. In completing the Matrix, describe how any debris-related activities associated with each scenario would or would not potentially require compliance with Federal environmental and historic preservation laws. If a need for compliance is unlikely, the reason should be stated.

Note that you may not have enough information to determine definitively whether there is an issue or not. The purpose of this activity is to identify the **potential** for issues based upon the level of information given.

You may work in your groups to complete the activity, but each participant must complete his/her own Matrix. There is no requirement to record your responses on the chart paper.

Participant Activity Scenario

A tornado has caused extensive damage to your community. A Federal disaster declaration is pending. Also, reference the disaster scenario and your community information provided in previous activities.

Scenario I

Old abandoned paint factory: The warehouse roof was partially torn off by the tornado. The tornado also left extensive vegetative debris around the building and throughout the site. Sporadic fires of unknown origin on the site have occurred. The community has decided to remove the debris from the site to minimize the potential for future fires. The debris will be temporarily stored in a nearby city park in a low-income neighborhood.

Scenario II

County Administration Building: Your county's Administration Building, currently nominated for listing on the National Historic Register, was damaged by the tornado. The County can provide a structural analysis from its Structural Engineering Consultant indicating that the structure is not repairable. Demolition will be underway shortly.

FEDERAL EMERGENCY MANAGEMENT AGENCY SPECIAL CONSIDERATIONS QUESTIONS		
1. APPLICANT'S NAME	2. FIPS NUMBER	3. DATE
4. PROJECT NAME	5. LOCATION	
Form must be filled out—for each project.		
1. Does the damaged facility or item of work have insurance and/or is it an insurable risk? <i>(e.g., buildings, equipment, vehicles, etc.)</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
2. Is the damaged facility located within a floodplain or coastal high hazard area, or does it have an impact on a floodplain or wetland? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
3. Is the damaged facility or item of work located within or adjacent to a Coastal Barrier Resource System Unit or an Otherwise Protected Area? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
4. Will the proposed facility repairs/reconstruction change the pre-disaster condition? <i>(e.g., footprint, material, location, capacity, use or function)</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
5. Does the applicant have a hazard mitigation proposal or would the applicant like technical assistance for a hazard mitigation proposal? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
6. Is the damaged facility on the National Register of Historic Places or the state historic listing? Is it older than 50 years? Are there more, similar buildings near the site? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
7. Are there any pristine or undisturbed areas on, or near, the project site? Are there large tracts of forestland? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
8. Are there any hazardous materials at or adjacent to the damaged facility and/or item of work? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		
9. Are there any other environmentally or controversial issues associated with the damaged facility and/or item of work? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Comments _____ _____		

FEMA Form 90-120, NOV 98

Unit 4: FEMA Eligibility and Reasonable Costs



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Unit Introduction

Large debris-generating events often result in a Presidential declaration of a major disaster wherein FEMA may provide supplemental assistance for eligible debris-related activities to those communities declared in the disaster.

- It is prudent for communities to be familiar with FEMA eligibility and reasonable costs guidelines during the planning stage in order to appropriately plan for critical issues such as contracting, monitoring, and preparing appropriate documentation to support requests for funding.
- Although there is not a requirement for communities to consider FEMA guidelines in the Debris Management Plans, a lack of knowledge of FEMA requirements has led communities to a loss of opportunities for funding.
- Therefore, this unit provides a discussion of:
 - The resources and tools available for assessing debris-related eligibility issues
 - Eligibility and reasonable cost issues for various debris activities
 - Distinctions between private and public property
 - Activities in assessing eligibility and reasonable cost issues and incorporating issues into debris planning
- This unit is intended to provide a general introduction to eligibility issues. It is not intended to cover all circumstances that may be encountered in the field. The tools and resources covered in this unit will assist the community in locating applicable laws and regulations relative to situations that may arise.

Introduction (Cont'd)

Objectives

- Identify eligibility and reasonable costs resources
- Explain eligibility and reasonable costs related to the planning and operations of debris-related activities

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Unit Objectives

At the end of this unit, you will be able to:

- Locate FEMA eligibility and reasonable cost resources.
- Evaluate FEMA eligibility and reasonable costs for debris-related activities.
- Assess FEMA eligibility and reasonable costs issues in debris planning.

Notes:



Laws, Regulations, and Resources

Laws and Regulations

- Stafford Act, sections 403, 407, 502
- Title 44 CFR, sections 206.224, 206.225
- FEMA policies
- State/Local Regulations and Policies

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FEMA and the PA Program are governed by the law defined in the Stafford Act and regulations provided in Title 44 of Code of Federal Regulations (44 CFR). These laws and regulations provide the criteria for determining eligibility of debris activities.

- **Stafford Act (PA Guide, Appendix B)**

- Section 403 Essential Assistance (page B-24) refers to the type of assistance available to meet immediate threats to life and property.
 - Basic eligibility for debris removal, clearance of roads, demolition, and reduction of immediate threats are all included in this section.
 - Use of Department of Defense (DOD) resources is also included but only rarely, if ever, used.
- Section 407 Debris Removal (page B-35) refers to more specific types of debris removal activities.
 - Debris and wreckage removal from public and private property.
 - The term indemnify is first used in this section as a method to protect the Federal government from claims.
 - Rules relating to large lots are also included.
 - Note: The FEMA Landslide Policy (*Landslide Policy Relating to Public Facilities*, FEMA 9524.2) indicates that removal of landslide debris from public and private property is authorized based on Section 407.
- Section 502 Federal Emergency Assistance (page B-49) authorizes Direct Federal Aid for debris removal activities.

- **Regulations 44 CFR Part 206 (PA Guide, Appendix C)**
 - 206.224 Debris Removal (page C-21)
 - Category A Criteria
 - Definition of public interest (*Discussed further in next slide*).
 - Criteria for debris removal from private property, including large lots.
 - Criteria for individuals and private organizations.
 - 206.225 Emergency Work (pages C-22, 23)
 - Category B Criteria
 - Emergency Protective Measures criteria used in determining eligibility for demolition. Cost effective measures must be used.
- **Regulations 44 CFR Part 206 (PA Guide, Appendix C)**
 - FEMA policies are prepared to provide clarification of the law and regulations, and to assist in consistent interpretation of regulatory criteria.
 - Policies pertinent to debris activities are discussed within this and later units.
- **State/Local**
 - Procurement processes must be followed
 - Environmental laws and regulations must be followed
 - Historical Preservation issues must be coordinated with the State Historical Preservation Office (SHPO)

Notes:



Laws, Regulations, and Resources (Cont'd)

Basic Eligibility

- Result of declared event
- Located in designated disaster area
- Legal responsibility of an eligible applicant

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Basic Eligibility

- General Work Eligibility Criteria defined in 44 CFR 206.223.

An item of work must:

- (1) Be required as the result of the major disaster event;
- (2) Be located within a designated disaster area; and
- (3) Be the legal responsibility of an eligible applicant.

Notes:



Laws, Regulations, and Resources (Cont'd)

Applicant Eligibility

- ❑ State government agencies
- ❑ Local governments
- ❑ Private Nonprofit Organizations
- ❑ Indian tribes and Alaska Native villages

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- Debris removal activities are eligible for both public and Private Nonprofit (PNP) applicants (44 CFR 206.222) as listed.
- For PNP applicants, debris activities are only eligible when they are associated with eligible PNP facilities.
 - **For example:** Removal of debris from a PNP recreational facility would not be eligible because PNP recreational facilities are not otherwise eligible PNP facilities.
 - Removal of debris from non-eligible facilities may only be eligible if the work meets the debris removal eligibility criteria (44 CFR 206.224(a)), and is performed by an eligible State, Tribal, or local governmental entity.

Debris removal activities by individuals and private organizations (non-PNPs) removing debris from their own property is not eligible. Additionally, eligible applicants cannot be reimbursed for payments they may make to individuals or private organizations for such work. (44 CFR 206.224(c))

Notes:



Laws, Regulations, and Resources (Cont'd)

Tools for Assessing Eligibility

- *Public Assistance Guide*
- *Public Assistance Policy Digest*
- *Debris Management Guide*
- FEMA Policies and Appeals
- Debris Eligibility Reference Table

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The documents and resources listed provide copies of the laws etc., and/or a discussion of the applicability of the eligibility criteria to specific situations.

- These documents, other than the Reference Table, are generally available to all in the process—*applicant, State, FEMA*—and are available on the Internet.
- An applicant may use these references:
 - In assessing eligibility of projects
 - For providing guidance to applicants and other PA staff
 - In supporting eligibility determinations

PA Guide (FEMA 322)

Debris eligibility criteria are located in various sections of the text of the PA Guide. The following are only samples of some of these references.

- Pages 67,68,69,70 — Category A—Debris Removal
 - Debris on roadways, in streams, and in wilderness areas is defined
 - Removal of temporary levees
 - Indemnification is a critical part of any debris removal from private property
 - Debris eligibility on Federal Aid System roads is defined
- Pages 71-74—Category B—Emergency Protective Measures
 - Cost effective measures to eliminate/reduce immediate threats to undamaged property, life, public health, or safety.

- Demolition, disposal of dead animals, boarding up buildings.
- Definition of immediate threat (page 71).
- Page 82—Category D—Water Control Facilities
 - Maintenance schedule and determination of pre-disaster debris is defined.
 - USACE and NRCS authority.

PA Policy Digest (FEMA 321)

- Page 31—Debris Removal
- Page 102—Private Property
 - Damages to private property during debris operations are not eligible unless a health or safety risk is present. Critical requirement for hold harmless and indemnification before accessing private property.

PA Debris Management Guide (FEMA 325)

- Page 6—Eligibility Criteria
 - Private property debris removal is the responsibility of the property owner, aided by insurance settlements and assistance from volunteer agencies.
 - Extent and duration of debris removal must be carefully controlled.
- Page 7—Debris removal from Recreational and Wilderness Areas
 - Criteria for determining eligibility of hazardous limbs from standing trees is provided.
- Page 9—FEMA Demolition Criteria
 - Slabs on grade, driveways, fences, and structurally sound buildings are not normally eligible.
 - Reasonable monitoring costs are eligible.
 - Asbestos and lead-based paint inspections, asbestos abatement and third party monitoring may be eligible.
 - Attractive nuisances are defined and eligibility criteria provided.

FEMA Policies—Located in the Policies Section

- Demolition of Private and Public Facilities (FEMA 9523.4)
- Mutual Aid Agreements for Public Assistance (FEMA 9523.6)
- Donated Resources (FEMA 9525.2)
- Duplication of Benefits—Non-Government Funds (FEMA 9525.3)

- Labor Costs—Emergency Work (FEMA 9525.7)
- Damage to Applicant-Owned Equipment (FEMA 9525.8)

- Disposition of Equipment, Supplies, and Salvaged Materials (FEMA 9525.12)

Appeals

- Appeal Determinations related to Debris:
 - Headquarters-level appeal determinations are posted on the FEMA Website.
 - Appeals are categorized by program or eligibility type issues and include debris-related issues.
 - Appeal determinations available on the Web may be used as guidance for determinations on similar projects. But, it must be understood that the appeal decisions apply specifically to the conditions described in the appeal analysis.
 - Common appeal issues related to debris include:
 - Methods of contracting and estimating debris quantities
 - Insufficient documentation to support quantities
 - Lost landfill space issues including associated costs and requests for replacement
 - Environmental issues related to volume reduction methods, storage and disposal locations, and landfill opening and closing
- Appeal Database on Web
 - The FEMA Website has an appeal database where a specific topic can be entered and all appeals that contain that topic will be listed

Debris Eligibility Reference Table—Located in the Policies Section

- As illustrated by the numerous sources of information described above, eligibility issues are located in many documents. It is, therefore, sometimes difficult and time consuming to locate a specific reference.
- The Debris Eligibility Reference Table was developed for this course to assist Debris staff in locating specific references to debris-related issues.
- Refer to the Debris Eligibility Reference Table located in the Policies Section. Discuss the general topics identified in the Table.

Laws, Regulations, and Resources (Cont'd)

Debris Removal Eligibility

- Eliminate immediate threat to life, public health, or safety
- Eliminate immediate threats of significant damage to improved public or private property
- Ensure economic recovery of the affected community to the benefit of the community-at-large

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- 44 CFR 206.224 states that debris removal activities are eligible when removal is in the *public interest*.
- *Public Interest* is defined as work necessary to:
 - Eliminate immediate threats to life, public health, and safety; or
 - Eliminate immediate threats of significant damage to improved public or private property; or
 - Ensure economic recovery of the affected community to the benefit of the community-at-large
 - Additionally, per statement in the June 26, 2001, Federal Register, the following additional criteria is added regarding the definition of *Public Interest*:
- Mitigate the risk to life and property by removing substantially damaged structures and associated appurtenances as needed to convert property acquired through a FEMA hazard mitigation program to uses compatible with open space, recreation, or wetlands management practices. Such removal must be completed within two years of the declaration date, unless the Associate Director for Readiness, Response and Recovery extends this period.
- Note that the terms *immediate threat*, *public health*, and *community-at-large* are very important in assessing eligibility.
 - The debris must pose an immediate threat. Debris that would not otherwise result in harm is not eligible for removal.
 - The eligibility of the activities must address public health and safety. Close attention must be paid to whether or not these conditions are met, especially when considering debris removal from private property. (*Discussed in more detail later in this unit.*)
 - Debris can be removed when necessary to ensure economic recovery of the *community-at-large*. This is generally defined as removing debris from **commercial areas** to

expedite economic recovery. It does not mean general debris removal from **private property**.

Eligibility Criteria and Issues

Debris Removal Eligibility

- Public roads
- Federal-Aid systems roads
- Homeowners' association and gated communities
- Native American reservations

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- The eligibility of debris activities has perhaps more factors, variables, and unique aspects to consider than any other item in PA. Significant issues of consideration include:
 - Applicant Eligibility
 - Public Versus Private Property
 - Vegetative and Other Debris Issue Considerations
 - Demolition
 - Curbside Debris Pickup
 - Hazardous/Toxic Waste
 - Insurance
- Each of the topics listed will be discussed in detail in this section.
- Cost, although a component of eligibility, will be discussed separately in the next section of this unit. Note that the issue of *reasonable costs* for debris activities is often a significant topic in reviewing applicants' requests for assistance and, therefore, warrants special consideration for discussion.

Eligibility Criteria and Issues (Cont'd)

Debris Removal Eligibility

- Public roads
- Federal-Aid systems roads
- Homeowners' association and gated communities
- Native American reservations

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In general, debris on public property that must be removed to allow safe operation of governmental functions or to alleviate an immediate threat is eligible.

Public Roads

- Generally, debris that is blocking streets and highways is considered a threat to public health and safety because it blocks passage of emergency vehicles or it blocks access to emergency facilities such as hospitals. Therefore, clearance of roadways is often a high priority.
- Debris may be removed from travel lanes, shoulders, roadside ditches and drainage features, and maintained rights-of-way.

Federal-Aid System Roads

- Federal-Aid System Roads are under the authority of the Federal Highway Administration (FHWA). Therefore, FEMA may not provide assistance for activities that would otherwise be eligible by the FHWA. (Stafford Act Section 312, Duplication of Benefits).
- The FHWA has responsibility for permanent restoration of these roads, and provides some assistance for emergency actions, including debris removal, through its Emergency Relief (ER) Program.
 - The ER Program can be authorized if damages to Federal-Aid System roads exceeds \$500,000.
 - A maximum of \$100 million per State per disaster is available.
 - Requires a minimum \$5000 per site.
 - Emergency work, including debris removal, can begin immediately after the event and does not require pre-approval from FHWA.

- The availability of the ER Program must be considered before funding debris removal activities.
 - Debris removal from Federal-Aid System Roads is eligible except when the FHWA ER Program is activated and the work is eligible for ER funding.
 - The ER Program may only grant debris-related assistance for sections of roadway damaged by the disaster. FEMA may fund debris removal from undamaged roadway sections, if it otherwise meets FEMA's eligibility criteria.
 - If the ER Program is not activated, FEMA may fund debris removal and emergency activities that meet its criteria.
- The FHWA ER Manual is available through the Internet: www.fhwa.dot.gov—U.S. Department of Transportation, Federal Highway Administration, Emergency Relief Manual, Federal-Aid Highways.

Homeowners' Association and Gated Communities

Debris Removal from Private Property (RP9523.13)

- The Policy allows for debris removal from gated communities, orphan roads, and private roads.
- Debris removal from all other private property (residential, commercial, and industrial) is generally the responsibility of the individual property owner, aided by insurance settlements and assistance from volunteer agencies.
- A residential private property owner may move disaster-related debris from his/her property and place it at the curbside for pickup by an eligible applicant if the eligible applicant implements a curbside debris collection program.
- PA Funding is not available to reimburse private property owners for their cost of removing debris from their property.

Native American Reservations

- When working on Native American Reservations, coordinate with FEMA Headquarters through the Debris Task Force Leader (DTFL) at the Joint Field Office (JFO) to assess eligibility.
- Be sure to collect pertinent information to assess the responsibility for, and thus the eligibility of, these roads.

Notes:



Eligibility Criteria and Issues (Cont'd)

Debris Removal Eligibility

Curbside Debris Pickup

- Be disaster-related debris
- Be separated from garbage
- Be kept in distinct piles
- Monitor pickup activities
- Keep public informed

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Debris Removal Eligibility - Continued

- Disaster-related debris from private property may be brought to the curbside and collected by an eligible applicant.
 - Construction and demolition materials from repairs and reconstruction should not be placed at curbside.
 - Items such as grass-clippings, household garbage, and automobile parts are not eligible.
- Residents should not mix normal garbage with disaster debris. Normal garbage pickup schedules should resume as soon as possible.
- Segregation of the types of debris will make the process go smoother and faster.
 - Applicants may be asked to separate their debris into the following categories:
 - Woody debris and yard waste
 - Household waste (damaged personal goods)
 - HHW
 - Construction and Demolition (C&D) waste (removed by the homeowner, not as a result of reconstruction)
- FEMA and/or the applicant should monitor the pickup activities to ensure that eligible materials are being collected and unnecessary mixing of debris does not occur.
 - The PA Group Supervisor/PA Debris Task Force Leader should work with the State counterpart to establish deadlines for debris pickup. The residents should be informed as soon as possible of the criteria for pickup, schedule, and deadlines.

Debris Removal Eligibility

- Mobile homes
- Trees, limbs and stumps
- Animal removal
- Vehicles and Vessels

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Debris Removal Eligibility - Continued

Mobile Homes

- During many disasters, especially a hurricane or tornado, there may be a large number of mobile homes totally demolished.
- The eligibility for mobile home removal should be evaluated as for any other residential structure—removal may be eligible if a threat can be demonstrated—but there are some unique aspects to the units themselves.
 - Before demolition begins, the applicant should make arrangements to be sure remaining personal items, furniture, etc., that may remain in the units are removed.
 - Check the units for asbestos and lead paint, and any other HHW.
 - Units may need to be crushed or taken apart—few landfills will accept the units intact.
 - State DOTs may have regulations relating to hauling demolished mobile homes on State highways.
 - Consider salvage of the metal components.

Hazardous Tree Limbs

Hazardous trees, limbs greater than 2 inches measured at point of break, and stumps on public property within or adjacent to improved or publicly used space, and on private property that meet criteria of posing a threat, may be eligible for removal. Examples include:

- Trees alongside public roadways
- Trees within a naturalized area of public parks or golf courses
- Trees within private property posing a threat to health and public safety or damage to residences.

- Hazardous trees 6 inches or greater in diameter that are unstable and leaning at an angle greater than 30% into the areas used by the public are eligible for removal

Straightening or bracing of trees is eligible for reimbursement when more cost effective than removal and disposal

Normally, trees requiring removal are flush cut to the ground.

Hazardous limbs considered to pose a threat are those that are still hanging in the tree and are threatening a public-use area, such as a trail, sidewalk, road or golf cart path, or other improved and maintained property.

Removal of fallen trees in a forested or wilderness area is not eligible.

Removal of cut trees from subdivisions under development or off the right-of-way in rural areas is typically not eligible as this condition generally does not pose an immediate threat.

Hazardous Stump Extraction: The Federal Emergency Management Agency (FEMA) will reimburse applicants reasonable costs for this type of work only when uprooted stumps are more than 24 inches in diameter with the consensus from the Applicant and the State, and is approved in advance by FEMA, using the attached Hazardous Stump Worksheet.

If it is necessary to remove an uprooted stump before it can be inspected by FEMA because it poses a threat that must be dealt with immediately, the applicant must submit documentation, to FEMA including photographs, that establishes its location on public property, specifics on the threat, stump diameter measured two feet up the trunk from the ground, quantity of material to fill the hole, and any special circumstances.

FEMA will reimburse applicants for extraction, transport and disposal of stumps with a diameter of 24 inches or smaller at the unit cost rate for regular vegetative debris, using the attached Stump Conversion Table, as such stumps do not require special equipment.

FEMA will reimburse applicants at the unit cost rate (usually cubic yards) for normal debris removal for all stumps, regardless of size, placed on the rights-of-way by others (i.e., contractors did not extract them from public property or property of eligible Private Non Profit organization). In such instances, applicants do not incur additional cost to remove these stumps – the same equipment is used to pick up “regular” debris can be used to pick up these stumps.

If an applicant incurs additional costs in picking up large stumps from rights-of-way, it should complete the Hazardous Stump Worksheet and present documentation to FEMA in advance for consideration.

Reimbursement for stump removal is extremely limited. Normally, reimbursement is limited to removing stumps that have been uprooted, and are located in an area where they would be a safety hazard. If a tree has been broken, instead of uprooted, the “stump hazard” is removed by cutting the tree at ground level. Stumps with less than 50% of their root ball exposed should be cut flush at ground level, and the cut portion included with regular vegetative debris.

A tree with more than 50% of the tree crown destroyed or damaged, a split trunk, or broken branches that expose the heartwood, or a tree that has been felled or uprooted is eligible for removal, especially if it is in a location approximate to or within public-use areas.

Animal Removal

- Disposal of farm and companion animals presents unique challenges.
- Local emergency managers need to be involved if extensive numbers of dead animals are found.
- Because of potential health issues, disposal of dead animals needs to be addressed quickly.
- Disposal methods, burning or burying, needs to be coordinated with appropriate environmental agencies.
- A specialty contractor may be needed to appropriately pick up, haul, and dispose of the animals.

Vehicles and Vessels

In order for removal of vehicles and vessels to be eligible the applicant must demonstrate that:

- The vehicle or vessel presents a hazard or immediate threat that blocks ingress/egress in a public use area;
- The vehicle or vessel is abandoned. (Example: vehicle or vessel is not on the owner's property and the ownership is undetermined);
- Applicants followed the local ordinances and State law by securing ownership; and
- Applicants verified chain of custody, transport, and disposal of the vehicle or vessel.

All supporting documentation relating to removal of abandoned vehicles and vessels must be submitted to FEMA for reimbursement consideration. For navigational vessels, applicants must follow their hazard abatement laws, coordinate with the requirements of the marine and harbor patrol agencies, and comply with local laws governing navigational vessels.

It is important for the applicant to follow its normal written procedures regardless of the circumstances. Any duplication of benefits issues will be addressed during FEMA's closeout evaluation.

Notes:



Debris Removal Eligibility

- Water control facilities
- Buildings
- Utilities
- Parks and recreation areas

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Debris Removal Eligibility - Continued

Water Control Facilities - General

- Water control facilities naturally collect debris and sediment on a regular basis, requiring maintenance of the facilities to maintain their function.
- Therefore, when evaluating debris removal eligibility from such facilities, it is necessary for the applicant to provide documentation to demonstrate the portion of the existing debris that was generated by the disaster. Evidence of a formal maintenance program and records of the program being implemented are often required.
- Although the applicant may choose to remove all debris, pre-disaster and disaster-related, only the disaster-related debris quantities are eligible, and generally, only that portion that is necessary to remove the threat.

Levees

- Debris removal from permanent levees is eligible for public health and safety, even from levees under authority of the USACE and National Resources Conservation Service (NRCS).
- Where temporary levees have been constructed as an emergency protective measure, removal of them is eligible only to protect public health and safety or to protect improved public or private property. This may be necessary to open roads.

Dams and Reservoirs

- Removal of debris from dams may be eligible—for example, if debris is blocking a spillway or intake structures.
- Removal of disaster-related debris from reservoirs may be eligible if evidence is provided that the reservoirs were regularly cleaned prior to the disaster and the pre-disaster level can be established.

Debris Basins, Drainage/Irrigation Channels

- Removal of silt, mud, and other debris from lined and unlined basins and engineered channels may be eligible if the pre-disaster level of debris can be determined. Such facilities must have a regular schedule of debris removal.

Natural Streams

- Debris removal from natural streams normally is not eligible. Only debris that causes a threat to lives or public health and safety or damage to improved property is eligible.
- Eligibility is limited to only material that could cause flooding during a 5-year flood.
- Any work in natural streams must be closely reviewed and monitored to minimize undesirable environmental effects.
 - This work will often require a CAA Section 404 permit from the USACE.
 - The NRCS also has authority to clear streams of debris.
- Removal of debris from the banks is generally not eligible.

Buildings

- Removal of mud and silt, or similar disaster-related debris in and on buildings is eligible.
- If furnishings from public buildings are damaged to the point where they become debris, they are eligible for removal and disposal if brought to the curb.
- Sometimes, public facilities are damaged to the point that demolition is necessary for public health and safety.
 - FEMA's policy on demolition must be reviewed for these situations. This policy will be reviewed later in this unit.
- Insurance, also discussed later in this unit, is a large consideration in building debris removal and demolition activities.
- Debris resulting from permanent repair activities is not eligible as Category A, but would be eligible under the permanent repair efforts.

Utilities

- Generally, debris removal from eligible utilities also will be eligible.
- Some materials may be salvageable.
- Environmental issues may be present, such as PCB-filled transformers.

Parks and Recreation Areas

- The removal of debris from parks and recreational areas used by the public is eligible when it affects public health or safety or proper utilization of such facilities.
- Damage to publicly owned marinas can include abandoned sunken boats and other debris that may impede navigation.
 - Identified navigation hazards are eligible for removal.
 - Coordination must be made between the U.S. Coast Guard, State Marine Patrol, local

government agencies, legal counsel, contractors specializing in marine salvage operations, commercial divers and certified surveyors to ensure the hazards are removed safely and efficiently.

- See the Navigation Hazard Removal Checklist provided on page 40 of the *Debris Management Guide*.
- Debris removal from wilderness or unused areas is not eligible.
- Disaster-related debris on beaches is eligible if the beaches are consistently used for public purposes and a health and safety hazard exists.
- Recreational facilities are not eligible PNP facilities. Therefore, debris would only be eligible in accordance with the eligibility criteria for private property (discussed later in this unit).

Notes:



Debris Removal Eligibility - Continued

Debris Removal Eligibility

Hazardous/Toxic Waste

- Eligible activities
 - Household Hazardous Waste (HHW)
- Ineligible activities
 - Long-term cleanup
 - RCRA/CERCLA Defined Activities

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- Major hazardous and toxic waste components are generally the responsibility of the Federal EPA.
- The PA Group Supervisor will coordinate with FEMA Headquarters at the beginning of a disaster to determine if there have been any agreements with the Federal EPA on addressing HAZMAT for the specific disaster.
 - For example, FEMA HQ may determine if retrieving and disposing of orphan drums and barrels will be funded by FEMA or through the Federal EPA.
- FEMA generally will fund the removal and disposal of HHW.
- FEMA may provide technical assistance to States on disposal methods.
- Activities related to long-term cleanup are generally not eligible for FEMA funding.

Notes:



Eligibility Criteria and Issues (Cont'd)

Private Property

General

In accordance with 44 CFR 206.224(b) Public Interest is defined as being necessary to:

- Eliminate immediate threat to life, public health and safety; or
- Eliminate immediate threats of significant damage to improved public or private property
- Ensure economic recovery of affected community to the benefit of the community-at-large

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- Debris removal from private property is generally the responsibility of the individual property owner, aided by insurance settlements and assistance from volunteer agencies.
 - Within a specified period of time, a private property owner may move disaster-related debris from his/her property to the curbside for pickup by an eligible applicant.
 - FEMA assistance is not available to reimburse private property owners for their cost of removing debris from their property.
- However, the Stafford Act Sections 403 and 407 and 44 CFR 206.224(b) provide FEMA the authority to fund eligible applicants to remove debris from private property. This work may only be eligible when:
 - The disaster caused very severe and widespread damage.
 - The removal is necessary to eliminate an immediate threat to life, public health and safety or to improve public or private property, or to ensure the economic recovery of the affected community **to the benefit of the community-at-large.** (*Discussion regarding defining a threat is provided on the next slide.*)
 - The work is performed by an eligible applicant, such as a municipal or county government.
 - The private property owner has provided all insurance information.
 - It is pre-approved by the Federal Coordinating Officer (FCO)
 - Required legal documents are in place
- Applicants and property owners must be aware that only FEMA makes eligibility determinations regarding removal of debris from private property. Not all actions taken by the local governments are eligible for FEMA assistance.

Eligibility Criteria and Issues (Cont'd)

Private Property **Immediate Threat**

An Immediate Threat is defined as:

“Additional damage or destruction from an event that can reasonably be expected to occur within five years”

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Private Property **Legal Responsibility**

Applicants must demonstrate that they have the legal responsibility under State or Local Statutes to remove the debris or demolish a damaged structure on private property

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Private Property Legal Issues

- Stafford Act – Sec 407(b)
 - Hold Harmless Agreement
 - Right of Entry Agreement
- Review by FCO

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- Section 407(b) of the Stafford Act requires that debris removal from private property not take place until the State, Tribal, or local government has agreed in writing to indemnify FEMA from a claim arising from such removal and obtained unconditional authorization to remove the debris from the property.
 - Note that because this criteria is specified in the Stafford Act, FEMA does not have the authority to waive this requirement.
- Note that this indemnification is also required for work performed on commercial property.
- The Joint Field Office (JFO) Attorney should review the documents prior to FCO/FEMA accepting them.

Notes:



Eligibility Criteria and Issues (Cont'd)

Private Property

Demonstrating the Threat

- Local Ordinances and Resolutions
- Local Building Official Determinations
- Local Health Official Determinations
- Economic Recovery of the Community

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- An applicant must demonstrate that removal of debris from private property is required to reduce a threat or ensure economic recovery (44 CFR 206.224).
- A *resolution* after a disaster by an applicant that debris on private property constitutes a threat to public health and safety does not in itself make the debris removal eligible.
 - The applicant should submit to FEMA for review and approval specific legal requirements for declaring the existence of the threat.
 - A damaged structure may be a public health and safety hazard if it could be condemned as such, pursuant to the provisions of an applicant's ordinance related to condemnation of damaged structures. A qualified individual, such as a certified building inspector, must make this determination.
 - A public health hazard may exist if such a determination is made pursuant to the provision of an applicant's ordinance related to public health. An individual qualified to do so, such as a public health official, must make such a determination.
- The determination of work being required to ensure economic recovery must be carefully reviewed.
 - This concept is often misapplied.
 - Use of this criterion is normally restricted to the removal of disaster-related debris from large commercial areas to expedite restoration of the economic viability of the affected community.

Eligibility Criteria and Issues (Cont'd)

Private Property

Ineligible Debris

- ❑ Removal of debris from vacant lots, forests, heavily wooded areas, unimproved property, unused areas and farmland
- ❑ Removal of debris from commercial properties and industrial parks
- ❑ Removal of re-construction debris

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Notes:



Private Property Ineligible Debris

- ❑ Removal of underground structures, wells, tanks, septic tanks, basements, pools
- ❑ Removal of driveways, concrete pads, slabs, foundations
- ❑ Demolition of commercial structures

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- Only disaster-related debris that requires removal to reduce or eliminate a threat or ensure economic recovery is eligible for removal.
- In general, FEMA will not pay for the removal of the following:
 - Privately owned vehicles, whether they are insured or not.
 - Old white goods located on private property awaiting proper disposal.
 - Old tires, batteries, or any equipment/material located on private property awaiting proper disposal.
 - Damaged swimming pools, basements, and foundations. If it is determined that a public safety hazard exists, FEMA may reimburse the cost of filling these structures.
 - Reconstruction debris, sometimes called construction rubble, resulting from reconstruction activities. Removal should be a part of the renovation contract and is to be removed by the contractor.
 - Debris that does not pose a threat is not eligible for removal. For example, miscellaneous debris, such as minor vegetation and rubble, is not eligible. Raking of private property to ensure glass and nails are removed is not eligible.
 - If an eligible applicant damages private property as a result of eligible debris removal activities, repairs to the property are not eligible unless the damage results in a health or safety risk. Similarly, if private property is damaged by a Federal agency engaged in disaster response activities, the Federal government is not liable for repairs to that property.

Notes:



Eligibility Criteria and Issues (Cont'd)

Other Eligibility Issues

Building Demolition

- ❑ Public and PNP facilities
- ❑ Private structures
- ❑ Eligible costs
- ❑ Ineligible activities
- ❑ Other considerations and checklists

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Authority

- Sections 403 and 407 of the Stafford Act allows for the demolition of unsafe public or private structures that pose an immediate threat to life, property, or public health and safety.
- The following is a summary of the key items of the FEMA Policy: Demolition of Private and Public Facilities (FEMA 9523.4), included in the Policies Section, and other references.
 - Public and PNP Eligible Facilities
 - Section 403 requires that the structures must be damaged by the disaster.
 - The structures must be determined to be unsafe and pose an immediate danger to the public. This determination must be made by local officials and verified by State and Federal officials.
 - Work must be completed within Emergency Work deadlines (44 CFR 206.204 – 6 months plus extensions).
 - Additionally, Section 407 (Stafford Act) allows for demolition in the public interest, ensuring economic recovery, but this only applies when the first two criteria above are met to the satisfaction of the Regional Director, **and** the structures have been uninhabited since the major disaster. The timeline for emergency work completion does not govern this authority.

- Private Structures
 - The structures must meet the first three criteria defined above for Public and PNP facilities.
 - Liability and legal permission requirements must be met.
 - Slabs or foundations, broken or intact, generally do not present a health or safety hazard to the general public. Slabs removed primarily for reconstruction are not eligible.
 - Individuals and private organizations (non PNPs) will not be reimbursed for their efforts on their own property.
- For health and safety reasons, the following demolition costs are eligible:
 - Capping wells
 - Pumping and capping septic tanks
 - Filling in basements and swimming pools
- Not eligible activities include:
 - Concrete slabs removed for reconstruction purposes, even when brought to the curbside
 - Removal or covering of pads and driveways
 - Structures condemned as safety hazards before the disaster
 - Habitable, but not yet damaged, structures even when they are in serious danger of total destruction (for example, on a failing slope)
- Section 404 Hazard Mitigation
 - When part of the Section 404 Hazard Mitigation buyout and relocation project, the removal of substantially damaged structures including slabs, driveways, fencing, garages, sheds, and similar appurtenances are eligible.
- Insurance must be considered.
- All work must be reviewed in accordance with environmental, historic, and other Federal laws. Refer to the table on the top of page 2 of the Policy.
- **Other Considerations**
 - Stress that demolition of a structure is not always the most cost-effective health and safety alternative. For “attractive nuisances” where structural integrity has not been compromised, cleaning and securing the facility may not be the best alternative.
- **Demolition Checklists**
 - This section contains various checklists for inspection, debris removal, and demolition activities for private property and mobile home parks.

Eligibility Criteria and Issues (Cont'd)

Special Use Areas

- Parks and Recreational Areas
- Public Marinas and Harbors
- Beaches

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Parks and Recreation Areas

The removal of debris from parks and recreational areas used by the public is eligible when it affects public health or safety or proper utilization of such facilities.

Public Marinas and Harbors

Damage to publicly owned marinas can include abandoned sunken boats and other debris that may impede navigation. Identified navigation hazards are eligible for removal by an eligible applicant. Coordination must be made between the U.S. Coast Guard, Other Federal Agencies, State Marine Patrol, local government agencies, legal counsel, and contractors specializing in marine salvage operations, commercial divers and certified surveyors to ensure the hazards are removed safely and efficiently.

Beaches

Disaster-related debris on beaches is eligible if the beaches are consistently used for public purposes and a health and safety hazard exists. The applicant must comply with all environmental laws when removing debris from beaches

Notes:



Reasonable Costs Criteria and Issues

Reasonable Cost

FEMA definition:

- A cost that is both fair and equitable for the type of work being performed (OMB A-87)

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- The definition of cost eligibility states that a cost must be reasonable and necessary to be eligible.
- A reasonable cost is a cost that is both fair and equitable for the type of work being performed.
- Communities often enter into contracts that may not meet the definition of reasonable cost.
 - For example: charging \$75/CY for hauling debris is unreasonable when the going rate for similar work in adjacent locations is \$25/CY.
- The reasonable cost requirement applies to all labor, materials, equipment, and contract costs awarded for the performance of eligible work.

Notes:



Reasonable Costs Criteria and Issues (Cont'd)

Eligible Costs

- Force Account Labor
- Equipment
- Materials & Supplies
- Mutual Aid
- Contracted Services
- Project Management
- Monitoring
- Volunteers (Offset Federal Cost Share)

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Force Account Labor

- To accomplish effective debris clearance in the early stages of the disaster response, an applicant may rely on personnel from various sources to perform or manage the work. The eligibility of this labor may vary per source. *Refer to FEMA Policy: Labor Costs—Emergency Work (FEMA 9525.7) (included in the Policies Section).*
 - The cost of straight-time salaries and benefits of an applicant’s **permanently employed personnel** are not eligible in calculating the cost of eligible emergency work. (Employees **reassigned** from another department to perform work are considered permanent employees, *Policy Digest*, page 93).
 - **Seasonally employed personnel**, when covered under existing budgets and used for a disaster during the season of employment, are considered **permanently employed personnel** for the purpose of cost eligibility.
 - **Temporary employees** hired as a direct result of the disaster are eligible for both regular time and overtime pay (*Policy Digest*, page 110).

Force Account Equipment

- The costs of using applicant owned (force account) equipment while conducting eligible work may be claimed on the basis of accepted equipment rates.
 - Refer to the Policy Digest, page 42, PA Guide, pages 37-38.
 - Rates are available through FEMA, the State, and sometimes locals.
 - FEMA will fund the least costly of the available rates.
 - Equipment rates generally include operation, insurance, depreciation, and maintenance.
 - Cost of labor to operate equipment is an additional cost.

- Extraordinary expenses for repairs and maintenance required due to severe conditions in disaster operations may be eligible for reimbursement. FEMA Policy 9525.8, Damage to Applicant-Owned Equipment, provides criteria for and examples of eligible conditions. (Policy included in Policies Section).

Mutual Aid Agreement, Volunteers

- Debris activities may be performed through Mutual Aid Agreements and volunteer organizations.

Contracts

- Costs of **contractors** used to accomplish emergency work are eligible for reimbursement.
- However, straight-time salary and benefits of **force account labor overseeing contractors** performing emergency work are not eligible in calculating the cost of eligible emergency work (*Labor Cost Policy*).

Project Management and Monitoring Costs

- It has been found that defining an acceptable percentage to estimate these costs is not appropriate.
- For example: There can be extensive amount of debris deposited in a relatively small area (say from a tornado) that requires minimal project management and a small number of monitors, or the same amount of debris widely scattered (hurricane event) that may require much more management and monitoring.
- Associated costs must be evaluated on a case-by-case basis—considering a reasonable amount of effort of appropriate level personnel. For example: it is unlikely that professional engineers would be necessary to monitor debris operations.

Notes:



Reasonable Costs Criteria and Issues (Cont'd)

Sources of Cost Data

- Historical data
- Contract cost for similar work
- State rates
- FEMA Cost Codes and Equipment Rates

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- Costs for work to be performed should not be determined arbitrarily.
- There must be some basis for the reasonableness.
- Costs may be determined by reviewing:
 - Historical data for similar work—within the locale or region, check previous disasters.
 - Applicant data for previous similar work (either force account or contract).
 - Contract costs for similar work being done in the area.
 - State Office of Emergency Services data.
 - FEMA cost codes for force account work.
 - FEMA equipment rates for applicant-owned equipment—may consider local or State rates, using whichever is less.
- Available cost data may need to be adjusted to reflect:
 - Timeframe of the operation—costs may be higher immediately after the disaster, but implementation of a bidding process for pickup and disposal should reduce costs.
 - Location of the operation—accessibility for debris pickup and disposal.
 - Other factors in evaluating costs are provided on the next slide.

Notes:



Reasonable Costs Criteria and Issues (Cont'd)

Factors Affecting Costs

- ❑ Travel distances and conditions
- ❑ Use of Debris Management Sites (DMS)
- ❑ Method of volume reduction
- ❑ Costs of disposal
- ❑ Environmental monitoring
- ❑ Landfill tipping fees

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- Each debris operation has unique aspects that affect the total cost, whether the work is performed by force account or contract.
- Other factors may include:
 - Security at the Debris Management Site to prevent off-hour dumping.
 - Some landfills may have a daily cap on how much waste they can landfill in a day—a special waiver may be needed by the State to allow emergency debris disposal over the regulated daily cap.
- Tipping Fees:
 - Components may include:
 - Bond payoff for construction
 - Operation
 - Cover materials
 - Expansion
 - Monitoring
 - The State PA Group Supervisor can indicate if there is a regulatory office that approves landfill tipping fees.
 - The charging of tipping fees should be consistent, and not waived for some and charged to others.
 - Waived tipping fees are not reimbursable.

Notes:



Reasonable Costs Criteria and Issues (Cont'd)

Salvaged Materials

- Mulch
- Scrap metals
- Concrete/Bricks/Masonry Items

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- Refer to FEMA Policy: Disposition of Equipment, Supplies and Salvaged Materials (FEMA 9525.12), page 4.
- Debris generated by a disaster may have a market value. Any revenue generated from debris must be used to offset the project cost.
- Reasonable costs expended by the applicant to administer and market the sale of the materials may be recouped by the applicant from the proceeds.
- If a contract provides for the contractor to take possession of the material in return for lower bid prices, there is no salvage value to be recouped.

Notes:



Review Activity 4.1



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Activity 4.1: Debris Eligibility Scenarios

Notes:



ACTIVITY 4.1: DEBRIS ELIGIBILITY SCENARIOS

Participant Activity Instructions

You have 55 minutes to complete the questions given for both scenarios. You may work in your group to respond to the questions, but each individual must record his/her own responses below.

PARTICIPANT ACTIVITY SCENARIO ONE

Scenario 1

You are on the staff of the Public Works Director for a community, of which the western portion is largely agricultural. A tornado has caused widespread damage including the depositing of tree limbs and construction material (including metal roofing) onto farmlands along the storm's path. The landowners claim the debris must be removed in order to prevent damage to harvesting equipment. The landowners claim that if the community does not pay for the debris removal directly from the farmlands, they will remove and stack the debris along the public roads, which may cause traffic hazards. The county in which your community is located was declared a Presidential Disaster area and qualifies for FEMA Public Assistance funding.

The Public Works Director has tasked you with researching FEMA guidance documents in order to determine if a claim can be made to FEMA for the cost of community employees or contractors removing the debris from the farmlands. The Director has stated that removal of this debris would be a benefit to the community-at-large as the farmers are major business owners.

Participant Activity One

- **What specific reference documents, including page numbers, would you use as a basis for your evaluation?**
- **What, if any, additional information would be required?**
- **What, if any, debris costs are eligible?**
- **What other options might you suggest to the applicant?**

ACTIVITY 4.1: DEBRIS ELIGIBILITY SCENARIOS

PARTICIPANT ACTIVITY SCENARIO TWO

Scenario 2

As a result of a hurricane and the associated storm surge, whole houses, white goods, hazardous materials containers, vehicles, silt, and other debris were deposited by the disaster and have completely filled several canals and waterways. These canals and waterways serve as both drainage structures and recreational waterways where residential structures have been built in canal front subdivisions. The county estimates 400,000 CY of material requires removal. Your community is within a Presidential disaster area and qualifies for FEMA Public Assistance funding.

The Public Works Director has tasked you with researching FEMA documents to determine if these costs are eligible.

- **What documents would you use as a basis for this determination?**

 - **What, if any additional information would be required to make a claim to FEMA?**

 - **What, if any, debris costs may be eligible?**

 - **What other options might you suggest to the Public Works Director?**
-

ACTIVITY 4.1: DEBRIS ELIGIBILITY SCENARIOS

PARTICIPANT ACTIVITY SCENARIO THREE

Scenario 3

As a result of a hurricane and the associated storm surge, your community has requested private property debris removal, which has been approved by the FCO. The community has begun taking Right of Entry and Hold Harmless Releases. The Indian Hills RV Park, a clothing optional RV Park has executed an ROE and requested private property debris removal. The RV Park is privately owned, and there were forty recreational vehicles owned by separate individuals in the park when the hurricane struck. Numerous trees are down blocking egress and ingress to areas of the park, and several trees have fallen through recreational vehicles that were parked in rental spaces. In addition the park has a half mile nature trail that rings the park and is clogged with numerous downed trees and leaners and hangers. Your community is within a Presidential disaster area and qualifies for FEMA Public Assistance funding.

The Public Works Director has tasked you with researching FEMA documents to determine if this work and these costs are eligible.

- **What documents would you use as a basis for this determination?**
- **What, if any additional information would be required to make a claim to FEMA?**
- **What, if any, debris costs may be eligible?**
- **What other options might you suggest to the Public Works Director?**

PARTICIPANT ACTIVITY SCENARIO FOUR

Scenario 4

As a result of a tornado, your community has requested private property debris removal, which has been approved by the FCO. The community has begun taking Right of Entry and Hold Harmless Releases. The First Christian Church has executed an ROE and requested private property debris removal. The church was severely damaged and the structure is partially collapsed. In addition numerous trees are down on the property blocking egress and ingress to the church property. There are also numerous leaner's and hangers in the still standing trees on the property as well. Your community is within a Presidential disaster area and qualifies for FEMA Public Assistance funding.

The Public Works Director has tasked you with researching FEMA documents to determine if this work and these costs are eligible.

- **What documents would you use as a basis for this determination?**
- **What, if any additional information would be required to make a claim to FEMA?**
- **What, if any, debris costs may be eligible?**
- **What other options might you suggest to the Public Works Director?**

Unit 5: Debris Operations



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Unit Introduction

- This unit provides more detailed discussion of the planning, evaluation, and operational activities for debris removal and disposal.
- This unit provides a discussion of:
 - The purpose and uses of a Debris Management Site, selection criteria, site layout, and closure considerations
 - Unique disposal considerations (animal carcasses and HHW)
 - Various methods of debris volume reduction

Notes:



Introduction (Cont'd)

Unit 5 – Objectives

- Identify Debris Operation priorities
- Describe uses and criteria for a Debris Management Site
- Discuss disposal options and volume reduction method

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Present Unit Objectives

At the end of this unit, you will be able to:

- 1) Identify Debris Operation priorities
- 2) Describe uses and criteria for a Debris Management Site
- 3) Discuss disposal options and volume reduction method

Notes:



Debris Operations

Prioritizing Activities

Initial Response—Debris Clearance

- Clearance of debris that hinders immediate life-saving actions and poses an immediate threat to public health and safety

Recovery—Debris Removal

- Removing and disposing of debris that hinders the orderly recovery of the community and poses less immediate threats to health and safety

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To effectively respond to a debris-generating event, it is important to prioritize the activities to be performed:

- Debris-related activities in response to a disaster event are generally described as Initial Response and Recovery.
- The Initial Response activities are performed in the early days of the event and are limited to:
 - Clearance of debris that hinders immediate life-saving actions and poses an immediate threat to public health and safety.
- The Recovery activities include:
 - Removing and disposing of debris that hinders the orderly recovery of the community and poses less immediate threats to health and safety.

The level of effort to complete these activities will differ due to the varying scope of the activities, timeframes, and available staff.

Notes:



Debris Operations

Prioritizing Activities

Initial Response

Debris clearance from roads to provide for:

- Movement of emergency vehicles
- Law enforcement
- Resumption of critical services
- Damage assessment to critical public facilities and utilities

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The primary activity performed in the Initial Response includes clearance of debris from roadways to the shoulders or curbs to allow:

- Movement of emergency vehicles: fire trucks, ambulances.
- Better movement of law enforcement agencies into the affected areas.
- Resumption of critical services: power, water, telephone.
- Damage assessment of critical public facilities and utilities in order to begin emergency repairs.

Notes:



Debris Operations Prioritizing Activities

Initial Response

- | | |
|--|---|
| <ul style="list-style-type: none">□ First Priority:<ul style="list-style-type: none">■ Hospitals■ Police■ Fire/Rescue stations■ Residential areas | <ul style="list-style-type: none">□ Second Priority:<ul style="list-style-type: none">■ Schools, municipal buildings, and shelters■ Water and wastewater treatment plants■ Power generation units■ Airports and seaports |
|--|---|

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- Priorities for clearance should be established to address the most critical situations first.
 - First Priority Clearance should include critical facilities that are pre-identified and prioritized based on potential disruption of life-saving services.
 - Second Priority Clearance is usually based on the need to restore critical community and health and safety services.
- Priorities may vary considerably between communities.

Notes:



Debris Operations

Recovery Activities

- Removal of debris from rights-of-way and public property
- Removal of debris from private property
- Hauling debris to Debris Management Sites
- Hauling debris to permanent landfills
- Recycling/reduction of debris
- Final disposal

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- During the Recovery activities, activities have expanded to the general removal of debris that poses an immediate threat to public health and safety, including:
 - Removal of debris from rights-of-way and public property
 - Hauling debris to Debris Management Sites
 - Hauling to permanent landfills
 - Removal of debris from private property, if that is being done. (Note that for Presidentially declared disasters, FEMA has very specific guidelines to be followed relative to removal of debris from private property. These criteria will be discussed in later units.)
 - Recycling/reduction activities
 - Final disposal

Notes:



Debris Operations Prioritizing Activities

Recovery Activities

- Coordinate with local public safety agencies
- Coordinate with State/Federal officials
- Conduct daily update briefings
- Implement curbside debris separation
- Implement traffic control procedures

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- Additional actions to be considered during Recovery activities:
 - Coordinate with local law enforcement officials. They need to know your plans and where you are working. Conversely, they may have requirements for your consideration.
 - Coordinate with appropriate State/Federal officials. This becomes very important if there is a Presidential declaration.
 - Conduct daily update briefings to ensure information is correct and timely.
 - Implement a good curbside debris separation program—it will save time.

Implement traffic control procedures. If there is a significant amount of debris, moving truckloads of debris through the rest of the response and recovery traffic, residents, and normal traffic can become a large logistics issue.

Notes:



Debris Operations Considerations

- Regulatory compliance
- Review applicable local ordinances on:
 - truck tarps and tailgates
 - traffic control and truck priority
 - curfews
 - load limits

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- Any regulatory compliance requirements must be considered in preparing the Plan as these requirements may have significant impact on the process or procedures for the activities.
- Therefore, the following issues need to be considered in developing the details of the plan:
 - How do you ensure compliance with environmental and historic preservation laws and regulations?
 - Local, State, and Federal levels must be considered.
 - What is the process for coordinating with regulatory agencies?
 - What waiver procedures will be allowed?
 - What are the local ordinances on the use of truck tarps or covers and tailgates, traffic control, truck routes, establishing priority of truck movement, curfews, and load limits?

Notes:



Debris Operations Operational Considerations

- Separate debris by type
- Segregate recyclable materials
- Segregate household hazardous waste
- Place debris on right-of-way
- Keep fire hydrants and valves cleared of debris piles
- Report locations of illegal dumping

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- Debris activities will go much faster and smoother if the general public is involved.
- Some of the things that might be considered:
 - Separate the debris into major types: vegetative, construction materials, white goods, etc.
 - Segregate recyclable materials, if recycling is part of your plan.
 - Segregate HHW. This is particularly important because if it is not done here and picked-up separately, it will delay activities at the Debris Management Site.
 - Make sure the debris is placed on the right-of way for easy pickup.
 - Don't pile debris on fire hydrants or over valves. They can be damaged during pick-up.
 - Report illegal dumping. This often becomes a very big issue—just when an area has been cleared, someone dumps construction rubble or hazardous material.

Notes:



Site Planning and Evaluation

What Is A Debris Management Site?

- A Debris Management Site (DMS) is a facility to:
 - Temporarily store debris
 - Segregate debris and/or
 - Reduce debris for recycling and final disposal

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- All activities associated with massive debris clearance, removal, and disposal activities depend upon the availability of suitable sites for managing debris (temporary storage, volume reduction actions).
- In major disasters, there may be insufficient landfills to handle the debris in a timely fashion. Communities may use a Debris Management Site to store, segregate, or reduce volume of debris.
 - A Debris Management Site may be used as a transfer site for final disposal where debris can be hauled and segregated for recycling or reduction if needed.
 - Recycling may take place on-site or picked up by the recycling firm.
 - Some reduction, especially of woody debris, usually occurs here.
 - The reduced debris can then be hauled to a landfill.
 - Also reduces traffic to landfills.

Notes:



Site Planning and Evaluation (Cont'd)

Debris Management Sites – Considerations

Advantages	Disadvantages
<ul style="list-style-type: none"> □ Flexible uses □ Minimizes impacts to existing landfills □ Reduces time for removal and disposal of debris 	<ul style="list-style-type: none"> □ Expensive □ Requires detailed planning/permitting □ Considerable historic and environmental requirements □ Requires dedicated site management

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Communities should provide careful consideration to the advantages and disadvantages of using a Debris Management Site.

Advantages

- Flexible Uses: A Debris Management Site can be customized to address specific disaster requirements.
 - For example, use for only segregation, or for temporary storage or reduction of certain types of debris.
- Minimize impacts to existing landfills
 - Existing landfills must still function for disposal of regular garbage; a Debris Management Site will minimize disruption.
 - If reduction is used, the quantity of debris disposed at the landfill will be significantly reduced.
- If the Debris Management Site is closer to the areas of pickup, the travel time for removal and disposal will be reduced, resulting in a more efficient and expedient operation.

Disadvantages

- Generally are expensive to develop and operate. Possible costs include:
 - Lease
 - Site planning
 - Permitting
 - Environmental and historic baseline studies

- Operations and management
- Often requires detailed site planning and permitting
- If not properly planned for, the permitting efforts could significantly impact the initiation of a Debris Management Site.
- Requires close attention to historic and environmental requirements
- The site must be properly managed and should not be totally left to the contractor. Experienced management staff should be provided on-site.

Notes:

Site Planning and Evaluation (Cont'd)

Site Selection Team

- Appropriate local agencies
- Appropriate State agencies
- Local officials
- Be interdisciplinary
- Coordinate with:
 - Local residents
 - Conservation and environmental groups
 - State Historic Preservation Office

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It is critical to have the appropriate agencies involved in the site selection and decisionmaking process to ensure pertinent issues are sufficiently addressed.

- When sites are being considered, make sure the site selection team includes a good cross section of:
 - Local agencies; those with major responsibilities for some of the actions involved: Department of Public Works, Solid Waste Management, Environmental Quality, for example.
 - Be sure State agencies are represented, particularly Solid Waste, Air Quality, Environmental Quality, and Emergency Management.
 - Include local officials; mayor, member of city council, county administrator, or representative.
- Team should be interdisciplinary.
- Coordinate with:
 - Local residents
 - Conservation and environmental groups
 - State Historic Preservation Office
- There needs to be a clear understanding by all parties of the intended use of these sites, and how impacts will be minimized.

Site Planning and Evaluation (Cont'd)

Site Selection Criteria

- Site ownership
- Site size
- Site location
- Site neighborhood concerns
- Baseline studies

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Site selection criteria—The following items should be considered by the site selection team in selecting the site:

- Site ownership:
 - Use public lands to avoid costly leases.
 - Use private land only if public sites are unavailable.
 - Have attorneys review leases to avoid closeout claims.
 - Provide possible extensions to the lease if needed.
 - Ensure the lease covers technical issues such as closure criteria, environmental issues.
- Site size:
 - Size depends on volume of debris to be collected, and planned volume reduction methods.
 - Sites typically range between 50 and 200 acres.
 - Experience has shown that it takes an average of approximately 100 acres to process 1 million cubic yards of debris.
 - Additional site size criteria is provided on the following slides.
- Site location:
 - Consider the impact of noise, traffic, and environment.
 - Look for good ingress/egress at sites to maximize efficiency of flow of traffic.
 - Consider impacts on neighboring communities of trucks hauling to sites.
 - Consider geological site conditions (stable ground, groundwater levels, soil or rock relatively impervious).

- Is the area geologically stable?
- Relatively impervious ground conditions are preferable. Pervious soils (gravel or coarse sand) and fractured rock will allow leachate to potentially contaminate groundwater.
- Abandoned quarries, which offer large open space, should not be used due to their potential for exposing groundwater to the debris leachate.
- Prevailing winds which tend to carry air particulates and noise in a particular direction
- Visibility from the surrounding area
- Avoid environmentally sensitive areas:
 - Wetlands
 - Rare (threatened) and critical animals or plant species
 - Well fields and surface water supplies—there is the potential for runoff from hazardous and toxic waste pollutants
 - Historical/archeological sites
- Site neighborhood concerns:
 - Around-the-clock light and noise (24-hour operations may be required at the onset of the operation)
 - Dust and Traffic
 - The USACE estimated that the amount of debris hauled during Andrew would fill trucks end-to-end from the Statue of Liberty in New York to the Golden Gate Bridge in California and back to the St. Louis Arch.
 - Smoke from burning activities
 - Runoff from hazardous and toxic waste (consider berms and holding ponds in design)
 - Avoid
 - Residential areas
 - Schools, churches, hospitals
 - Other sensitive areas
- After potential sites have been selected, an environmental baseline study should be conducted to document existing conditions and assess potential environmental or historic impacts.

Notes:



Site Planning and Evaluation (Cont'd)

Evaluation Criteria – Size

- Dependent on:
 - Expected volume of debris to be collected
 - Planned volume reduction methods
 - Volume recycling rate
- Anticipate between 50-200 acres

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A significant component of the evaluation is to optimize the size of the site.

- The total area for debris management is based on:
 - The expected volume of debris, as estimated using debris forecasting models discussed previously
 - The volume reduction methods to be used. Volume reduction and recycling will be discussed in more detail in a later section of this unit.
 - What is the volume recycling rate?
 - This relates to how fast debris will move through the site—usually 30–45 days.
 - Volume reduction should begin immediately. As it is reduced, it should be moved to a final disposal site, and not remain at the Debris Management Site. This reduces the site size requirements, and ensures an efficient debris operation.
- Experience has shown:
 - Sites should range between 50 and 200 acres.
 - It takes an average of approximately 100 acres to process 1 million cubic yards of debris; however, that should be used as a check.

Notes:



Site Planning and Evaluation (Cont'd)

Evaluation Criteria – Size

Factors:

- Estimate debris will be 10' high stacks
- Total volume per acre = 16,117 cy
(3.33 yards x 4,840 sy/acre)
- 60% of area used for roads, buffers, burn pits, HHW disposal sites, etc.
- Debris moved by others (15%-30%)
- Overall debris mix

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- The actual amount of land required can be estimated using a combination of factors and assumptions based on experience.
- The following are assumptions used by the USACE when determining the minimum size required for debris storage:
 - Debris will be piled 10' high, which equals 3.33 yards.
 - One acre is equal to 4, 840 square yards.
 - One acre of debris, 3.33 yards high, would equal 16,117 cy.
- However, there are other factors in the design and use of the site that significantly impact the required size:
 - Approximately 60% of the area will be used for roads, buffers, burn pits, HHW disposal areas, etc.
 - Therefore, the number result of dividing the forecasted amount of debris by 16,117 cy must be increased by 1.66.
- Additional debris will be moved by other entities (residences, businesses, and volunteer groups). Accommodations for this material need to be considered.
 - Where it is taken will depend upon decisions made by local government.
 - Directly to the landfill
 - To the Debris Management Site
 - The Debris Management Plan should clearly identify where debris can be taken, and have pre-scripted announcements that can be used immediately after the event.
 - The USACE uses the percentage of 15-30% for this volume, depending on the volume contributed by local governments or other contractors.
- Debris mix is another factor in estimating size:
 - Will handling of the debris require separate areas within the site?

Site Planning and Evaluation (Cont'd)

**Evaluation Criteria –
Baseline Data Checklist**

- Environmental Baseline Study
 - Document existing conditions
 - Assess potential impacts of use
 - Establish a monitoring program and closure criteria
 - Coordinate with appropriate State and local agencies

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- After potential sites have been selected, an environmental baseline study should be conducted.
- The results of this study will provide further guidance for final selection of a site and pre-use environmental information.
- The study should address several issues:
 - Document existing conditions
 - Develop mitigation measures to minimize or eliminate impacts
 - Develop information for waivers, if applicable
 - Minimize the potential for problems when the site is opened, operating, and closed
 - Establish a monitoring program for:
 - Air quality, relative to potential dust, and especially if any burning will occur
 - Water, both surface and ground
 - Fuel spills. With all the equipment used around a site, there are inevitably oil, fuel, and hydraulic fluid spills or leaks. There should be in-place a plan to document the spills, as well as actions taken. Usually, if affected soil is removed immediately, there is little problem.
- It is critical to coordinate with appropriate State and local agencies to ensure all appropriate laws and regulations have been considered and appropriately addressed.
- In conducting this study:
 - Take photographs and videos of the site to document conditions.
 - Take random soil and water samples to verify existing conditions.
 - Check soil for volatile organic compounds.
 - Check drainage—determine if berms for holding ponds will be necessary.
 - Check for threatened and endangered species and habitat.

- Obtain ambient air quality data.
- Check for historic sites.

Site Planning and Evaluation (Cont'd)

Site Evaluation Criteria

See “References” for the
Job Aid
Technical Assistance
Debris Management Site

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Notes:



Site Operations



- This slide illustrates an improper site layout.
 - The site provided insufficient space to effectively perform needed operations.
 - The site has been named “Mount Trashmore” (Hurricane Andrew, south Florida).



- This slide illustrates a properly designed and managed site.
- This site is approximately 100 acres and shows separate areas for burning, grinding, and recycling.

Improper Site Operations

Debris Management Site



Improper Site Operation

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- Picture is of a DMS located in Mississippi after Hurricane Katrina.
- This is an example of non-segregation of materials.
- In this photograph, you can see white goods, C&D, vegetation, and other types of mixed debris being shoved into one large pile.

Notes:



Site Operations and Closure (Cont'd)

Site Operations

- Establish and maintain buffer zones
- Construct containment berms
- Ensure segregation of materials based on volume reduction methods
- Develop holding areas for ash, household hazardous waste, and fuels
- Develop efficient process of keeping debris moving
- Provide suitable monitoring stations

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As the site is developed, keep in mind efficient site operations:

- Establish and maintain buffer zones around the perimeter of the site, but inside the boundaries.
- Construct containment berms as necessary to separate and contain various types of debris.
- Ensure that incoming materials are segregated based on volume reduction methods—burning, grinding, bailing, etc.
- Develop holding areas for ash, HHW, and fuels. Line these areas with plastic or other approved liners.
- Implement an efficient process of keeping debris moving into the site, property separated and reduced, and out of the site.

Notes:



Site Operations (Cont'd)

Unique Disposal Issues – Animals and Bi-Products

Animals and Other
Bi-Products





Environmental
and Safety Issues

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- Disposal of animals and other bi-products is a major consideration in many disasters, particularly flood events.
- There are various ways to dispose of animal carcasses:
 - The most common method is to bury the animals.
- Farmers and ranchers are allowed to do this on agricultural land.
- However, factors such as volume of carcasses, water source, water table, or disease may prohibit burial.
 - Composting is often used for poultry, especially after a flood event. Most farmers use this method on a regular basis.
 - Rendering may be suitable. There are often large rendering plants, usually not far from the affected area. The only problem could be volume and possible timing, i.e., washed out roads, etc.
 - Incineration—two methods:
 - An enclosed incinerator or an air curtain or pit burner
 - The first of these methods is preferred, but not always available.
 - When considering use of any of these methods, the community must work with the local or State extension personnel who have more experience and know what is available in the area.
- The community and the State need to work with the local and State-level agricultural agencies to select a suitable disposal method and site.
 - The agricultural groups have the primary responsibility.

- In Federally declared disasters, if it is a matter of public health and safety, and beyond the capabilities of the local government or the State, then FEMA can provide assistance through either Direct Federal Assistance (Mission Assignments) or through the PA Program.
- Health of the workers as well as the community at large must be considered when making a decision as to where and how to dispose of animal carcasses.
- The size of the facility and location to water sources can play an important factor in disposal, as well as a great challenge.

Notes:

Site Operations (Cont'd)

Unique Disposal Issues – Household Hazardous Waste



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- Specific handling and disposal criteria for HHW should be identified in the community's normal disposal policy and such criteria should be followed.
 - Conscientious personnel should be assigned to ensure the criteria is followed.
- HHW should be separated from other debris and placed in a temporary holding area.
- Appropriate closure procedures for HHW materials should be established and followed.
- Notice that this photograph illustrates improper disposal of these materials.
 - Materials are not segregated. Tires, tanks, and containers are randomly scattered.

Notes:



Site Operations (Cont'd)

Unique Disposal Issues – Temporary HHW Storage Area



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- This photograph is an example of a temporary HHW holding area. Note that it is lined and fenced.

Notes:



Site Operations (Cont'd)

Environmental Monitoring

- Groundwater
- Surface Water
- Air Quality
- Ash
- Soil

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Environmental monitoring at the Debris Management Site should begin with the onset of the operations.

Groundwater

- As required or necessary, develop and check monitoring wells to determine the effects of rainfall leaching through the site into groundwater.
- Continuously compare the test results to baseline data.
- Maintain the results of this monitoring.

Surface Water

- Check surface water runoff to determine water quality.
- Make sure the runoff is monitored before it enters a stream to ensure any measured pollutant originates in the site, and not from a point upstream of the site.

Air Quality

- Debris-burning activities probably will require air quality monitoring, and monitoring may be required to track dust and pollution from the equipment.
- Be sure to coordinate with local, State, and Federal air quality agencies to determine requirements and waivers.
- If monitoring is required, it usually will be for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and possibly lead and particulate matter less than 10 microns in size.

Ash and Soil

- If any burning is done at the site, there usually will be a requirement to test the ash before final disposal.
- The test used is toxicity characteristic leaching procedure (TCLP).
- One TCLP sample is taken at each separate ash pile.
- Soil may be tested for presence of volatile hydrocarbon contamination.

Site Operations (Cont'd)

Environmental Monitoring

- Require immediate fuel and hydraulic spill cleanup; document
- Periodically take photographs
- Maintain up-to-date maps and sketches
- Document any changes, tests, problems, monitoring visits

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The Debris Management Plan should include other issues related to environmental monitoring, requiring items such as:

- Immediately clean-up fuel and hydraulic spills. Document the incident—when it occurred, when it was cleaned up, and when/where the material was disposed.
- Periodically take photographs of the operation, monitoring activities, etc.
- Maintain up-to-date maps and sketches.
- Document any changes, tests, problems, actions taken, and monitoring visits by other agency personnel.

Notes:



Site Operations and Closure

Debris Management Site – Closure

- Ensure operations are complete
- Site cleaning
- Final environmental sampling
- Site restoration
- Obtain acceptance from property owner
- Terminate lease

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- Site closure is a critical portion of the debris mission.
- Prior to closure:
 - Ensure all operations are complete and the site has been cleared and cleaned of all debris.
 - Ensure current environmental data on soil and water has been compared to baseline data taken before the site was activated.
 - Ensure the site has been restored to its prior condition.
 - If the site is leased, get acceptance from the landowner.
 - Terminate lease.

Notes:



Volume Reduction and Recycling

Debris Management Site

Volume Reduction

Primary methods:

- Burning
- Chipping and Grinding

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- Volume reduction is a significant component to consider in a debris operation.
 - It reduces the impact on the final disposal site.
 - Handling and transportation costs are less because the volume is less.
- Depending on the type of debris generated, the original volume may be significantly reduced by using one or a combination of these primary methods:
 - Burning (mostly used with woody debris)
 - Chipping and grinding (mostly used with woody debris)
 - Recycling (mostly used with metals, but could have other uses)
- Volume reduction should be given a high priority in debris operations so as to reduce the impact on otherwise limited landfill space.
 - Vegetative debris can be reduced by as much as:
 - **75% if ground, 95% if burned**
 - Some debris may require sorting and different types of reduction and disposal. For example, C&D materials generally consist of the following breakdown:
 - 42% burnable material (after sorting)
 - 38% suitable for landfill
 - 15% metals, possible recyclable
 - 5% soil, possible recyclable
- Volume reduction is often one of the major tasks that is accomplished at the Debris Management Site, especially for woody debris after hurricanes and tornadoes.

Volume Reduction and Recycling (Cont'd)

Volume Reduction – Operational Considerations

- What is the expected debris mix?
- Is reduction necessary?
- What can be reduced?
- How can it be reduced?
- Where can it go?

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When preparing the Debris Management Plan, volume reduction methods should be considered. The following are some considerations to assist with this task.

- What is the projected debris mix?
 - This will provide an initial indication of the feasibility of various types of volume reduction. There may be a potential for asbestos in C&D, requiring special handling.
- Is reduction necessary?
 - Is most of the debris the type that has minimal reduction potential—construction material, for example?
- What can be reduced?
 - Look at the mix and determine what material can be effectively reduced.
- How can it be reduced?
 - Sometimes the answer to this question results in a determination that the reduction process combined with the amount of debris to be reduced is not effective.
- Where can it go?
 - What will be done with it after reduction? Does it all go to one landfill? Will some of it have to go to special permitted landfills?

Notes:



Volume Reduction and Recycling (Cont'd)

Volume Reduction – Burning

- Primary Burning Methods:
 - Controlled open burning
 - Air curtain pit burning
 - Portable air curtain incinerators

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- There are three primary burning methods:
 - Controlled open burning
 - Air curtain pit burning
 - Portable air curtain incinerators
- Must check with all applicable State, Tribal, and local regulations before selecting this method.
- **Controlled open burning**
 - Cost-effective for clean, woody debris
 - Presents little environmental damage—usually acceptable in rural areas
 - But, must be performed in accordance with permit requirements
 - Process should be terminated if mixed debris is encountered
 - Resulting ash may be used by agricultural community
- **Uncontrolled open burning** sometimes occurs due to spontaneous combustion, but otherwise, it is the least desirable and usually illegal.

Notes:



Volume Reduction and Recycling (Cont'd)

Volume Reduction – Vegetative Grinding and Chipping

- Reduces volume by a ratio of 4 to 1
- Preferred method for reduction of vegetative debris
- Allows better ease of site management

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- Grinding and chipping is a means to reduce the volume of woody debris, and often is used when burning is banned.
- This method generally reduces the volume by 75% (4 to 1).
 - However, the type and mix of the debris may cause the reduction rate to vary. Therefore, it may be appropriate to make test runs early in the process.
- The process produces material usually suitable as mulch.
 - To be effective, there should be a use for the resulting mulch.
 - Possible uses of the wood chips:
 - Fuel for industrial heating
 - Landfill cover
 - Agricultural mulch

Notes:



Volume Reduction and Recycling (Cont'd)

Volume Reduction – C&D Grinding and Chipping

- Reduces debris volume by a ratio of 4 to 1
- Method for reduction of C&D debris
- Extensive regulatory compliance to obtain permits
- Requires extensive environmental monitoring

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- Grinding and chipping is a means to reduce the volume of C&D, and often is used when burning is banned.
- This method generally reduces the volume by 75% (4 to 1).
 - However, the type and mix of the debris may cause the reduction rate to vary. Therefore, it may be appropriate to make test runs early in the process.
- The process produces material usually suitable to be landfilled and uses much less space.
- Extensive regulatory compliance to obtain permits
- Requires extensive environmental monitoring

Notes:



Volume Reduction and Recycling (Cont'd)

Grinding and Chipping Equipment



Brush Chipper



Tub Grinder

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Brush Chippers

- Brush chippers are portable and self-loading.
- Usually limited to small branches, although some larger machines are becoming available.
- Because of their limited use, they usually don't meet the needs of disaster-generated debris; therefore, brush chippers are not commonly used in disasters.

Tub Grinders

- Tub grinders are more common in disaster operations.
 - Usually are stationary equipment located at the Debris Management Site.
- These machines are expensive and usually require a significant amount of maintenance.
 - The teeth in the grinder require frequent sharpening and often removal and replacement.
 - When grinding palm trees, the grinder must be stopped frequently to remove the fiber and sand; therefore, more “downtime” and thus higher costs.
- The machines must have a clear zone for safety, as large chips fly out of the grinder.
- Always check the production rate of the grinder in actual use. The rate varies with the machine and with the material being reduced. Palm trees, for example, tend to be very fibrous, requiring machine downtime to clean out the fibers.

Volume Reduction and Recycling (Cont'd)

Grinding and Chipping Equipment



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- This photograph is an aerial view of a tub grinder in operation.
- In this instance, a separate piece of equipment is loading the tub.
- The reduced material is removed by a conveyor and deposited in piles.
- When the piles become too large for the machine to operate efficiently, either the pile or the machine must be moved.

Grinding and Chipping Equipment



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Volume Reduction and Recycling (Cont'd)

Grinding and Chipping Equipment



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Photograph of a C&D grinder in operation in Plaquemines after Hurricane Katrina

Volume Reduction Combination



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- This is a combination wood and metal shredder. If all the material is going to a landfill, this machine will reduce a combination of wood and metal.

Volume Reduction and Recycling (Cont'd)

Metal Reduction

Metal Mauler



Baled Metal

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Notes:



Debris Removal Operations



Debris loading operations on the Mississippi Gulf Coast after Hurricane Katrina.



Debris removal of white goods from the public beach at Grand Isle, Louisiana, after Hurricane Katrina.

Debris Removal Operations

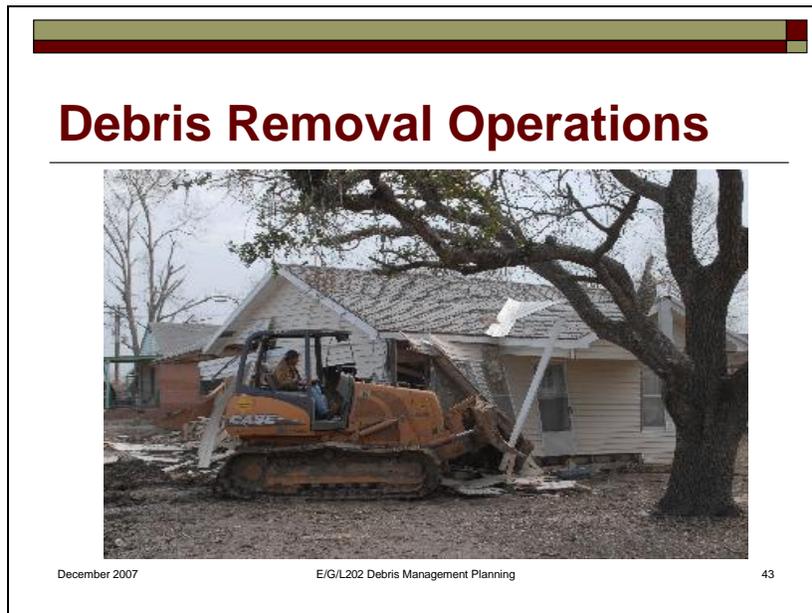


Debris removal of heavy metal goods in Cameron Parish, Louisiana, after Hurricane Rita.



Debris removal of vegetative debris in southern Jefferson County, Texas, after Hurricane Rita.

Debris Removal Operations



Structural demolition operations in Cameron, Louisiana, after Hurricane Rita.



Structural demolition of a private residence in lower Plaquemines Parish, Louisiana, after Hurricane Katrina.

Debris Removal Operations



Removal of a debris field south of Slidell, Louisiana, after Hurricane Katrina. The equipment is pushing a massive field of debris from numerous pieces of private property out to a roadway to be loaded and removed.

Notes:



Volume Reduction and Recycling (Cont'd)

Shredded Vegetation



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- This mulch is unsuitable for agricultural purposes.
 - The chips are too large.
 - It contains plastics and other contaminants.

Mulch



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- This mulch would be acceptable for agricultural purposes.
 - Note the clean, small size.

Volume Reduction and Recycling (Cont'd)

Recycling

- Consider in both DMS and landfills
- Recycling may result in lower costs
- Complies with intent of RCRA

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- Recycling is a third possible method to consider in volume reduction.
- The prospect of reducing the expenditure for debris operations is an important issue. Recycling disaster debris is an opportunity to reduce debris-related costs.
 - In previous disasters, such as Hurricanes Andrew, Iniki, and Marilyn, effective debris recycling operations were instituted which resulted in a substantial reduction in debris management expenditures.
 - After the Northridge Earthquake, recycling of debris was especially emphasized, and 65% of the debris was recycled.
- FEMA must comply with RCRA, which requires safe disposal of waste materials, encourages cooperation with local agencies, and promotes recycling of waste material.
- Planning to recycle disaster debris is a proactive approach to addressing issues relating to environmental health and conservation of natural resources. Implementing a plan for recycling disaster debris is much easier if a community already has a recycling program in place.
- The majority of large communities in the United States already have such programs. In these instances, permitting, enforcement, collection, processing, and marketing issues already will have been largely resolved. As a result of the disaster, the community will be faced only with expanding current recycling practices, rather than designing and implementing new practices.
- It is cost effective and easier to expand existing capacities and markets than to start these endeavors in the wake of a disaster.
- It may be appropriate to initially reduce the volume, then recycle. For example, clean woody debris may be ground into mulch, then recycled.

Volume Reduction and Recycling (Cont'd)

Recycling Cost Effective

- Lower transportation costs
- Maximize efficiencies
- Lower tipping fees
- Tracking and Monitoring
- Recycling revenues off-sets

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- Non-productive labor and equipment costs associated with long hauls to landfills and the excessive wait times at landfill facilities usually can be avoided at recycling facilities because there may be more than one resource recovery/recycling facility located in close proximity to the devastated areas. In most instances, both hauling and waiting times are shortened with recycling operations, which in turn allow for faster and more efficient debris collection routes.
- Generally, costs for implementing a recycling debris operation are less than landfilling operations because of avoided costs. Tipping fees at recycling facilities on average are 15% less than tipping fees at landfills.
- Recycling generates revenues. Therefore, materials that are sold to secondary markets are closely monitored and tracked so that the maximum amount of resale dollars is obtained. Therefore, monitoring of debris disposal and recycling is easier to track.
- Local governments may use revenues received from the sale of recyclables to off-set the cost of debris operations. In some instances, the recycling contractor may offer a reduced contracting rate to a community so that it may retain the ownership of the recyclables and achieve its profit margins through the sale of the recyclable materials.
- These actions can result in reducing the Federal costs related to debris disposal.

Notes:



Volume Reduction and Recycling (Cont'd)

Recycling

- Metals
- Soil
- Construction Materials
- Concrete/Masonry/Brick
- Plastics and Glass
- Mulch

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Metals

- Depending upon the amount of metal involved in the debris operation, it can be segregated, then separated into ferrous and non-ferrous piles using an electromagnet. The materials generally are then crushed.
- Alternately, the materials may be shredded and bailed.
- Some of the equipment required to recycle metals is large and expensive, and may only be found at recycling locations. It will be important to determine what can be done at the Debris Management Site, and what should be done at the recycling site.
 - For example, the electromagnet used to separate ferrous/non-ferrous metals is usually found only at the recycling site.
- When a community contracts for the activities to be performed at the Debris Management Site, it is the community's responsibility to determine the cost-effectiveness of all the equipment to be used. As noted in the previous example, it may be better to haul the metals to the recycling yard rather than sort them at the site.

Soil

- Because of the equipment used in loading trucks, there is always soil picked up during debris operations. Care should be taken to ensure that is minimized, but it will happen even in well-managed operations.
- Soil can be recycled, primarily for agricultural/residential use, or for fill material.
- If it is to be used for either, it should be analyzed for contaminants.

- After Hurricane Andrew in Florida, soil from a Debris Management Site was desired by several of the large agricultural operations; however, testing showed excessive contamination.
- If used for agricultural/residential purposes, the soil may require sifting to delete non-soil impurities (pieces of wood, metal, etc.).
- Different uses of the fill material will have unique specifications; it is important to ensure that the fill is applicable for its intended use.

Construction Materials

- Construction materials, such as brick or concrete blocks, may be reused directly.
- Materials from older damaged buildings are sometimes in high demand.
- Concrete and asphalt may be ground and used as:
 - Aggregate sub-base
 - Aggregate base
 - Gravel road resurfacing
 - Base for building foundations
 - Fill for utility trenches
- Drywall is recyclable as:
 - New drywall
 - Cement additive
 - Stucco additive

Plastics and Glass

- Plastics can be shredded and baled, then sent to a facility to be palletized.
- Glass can be recycled for reuse.

Clean vegetative debris

- From a general perspective, the largest volume of debris is vegetative.
- As indicated in previous slides, vegetative debris can be used as mulch.

Notes:



Unit 6: Debris Monitoring Procedures



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Unit Introduction

- Debris activities require monitoring by trained and properly supervised personnel.
- Effective debris management planning requires a thorough understanding of debris monitoring responsibilities and techniques.
- Most importantly, debris monitoring is the most effective process for identifying, evaluating, and resolving debris issues.

Notes:



Objectives

- Describe monitoring responsibilities
- Evaluate a Debris Monitoring Plan
- Address monitoring issues in debris planning

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Unit Objectives

- At the end of this unit, you will be able to:
 - Describe debris monitoring responsibilities.
 - Evaluate a Debris Monitoring Plan.
 - Address debris monitoring issues in debris planning.

Notes:



Debris Monitoring Responsibilities

Monitoring Considerations

- Responsibilities
- Staff
- Reporting
- Activities and techniques

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- As discussed in earlier units, inadequate monitoring of debris activities often results in disputes between a community and the contractor, and/or the community and FEMA over Federal reimbursement for debris removal, reduction and disposal, and often loss of funding.
- This section of the unit addresses various monitoring considerations that are critical to effective monitoring of debris activities.
 - Responsibilities of the community as well as FEMA in a Presidentially declared event
 - Staff to perform tasks
 - Documentation and reporting requirements
 - Monitoring activities and techniques
- It is important to recognize that the monitoring process is used to both identify and resolve debris-related issues.

Notes:



Debris Monitoring Responsibilities (Cont'd)

Monitoring Responsibilities

Applicant

- Responsible for monitoring all of their Debris Operations

State

- Responsible for monitoring Applicant Debris Operations

FEMA

- Responsible for insuring the Applicant/State has a comprehensive monitoring process

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- It is the primary responsibility of the community to independently monitor all debris activities, whether performed by its own force account labor or contract.
 - For the purpose of this discussion, the community’s monitoring staff is referred to as the Debris Field Monitor.
 - The Debris Field Monitor is responsible for monitoring of the specific day-to-day field activities.
- In Presidentially declared events, FEMA may also perform overall monitoring of an applicant’s debris activities. However, as discussed herein, this does not relieve applicants of any of their own monitoring responsibilities.
 - For the purpose of this discussion, FEMA’s monitoring staff is referred to as the PA Program Debris Monitor.

State/Applicant Responsibility

- The State/Applicant Debris Field Monitor typically will:
 - Be assigned to a specific task and be onsite every day
 - Monitor specific activities at loading sites, Debris Management Site inspection sites, or landfills
 - Prepare a quantitative report of activities completed
 - Most importantly, identify and resolve debris issues

- For Presidentially declared disasters, it is the applicant's responsibility to provide sufficient documentation to support that:
 - The scope of the work performed meets FEMA's eligibility criteria (discussed in Unit 4)
 - Often, a contractor or the applicant's own forces may perform activities that are not eligible for FEMA reimbursement while completing other eligible activities. Such work must be clearly identified, documented, and quantified to minimize disputes when the work is completed.
 - The quantities (cubic yards of debris, hours of operation, etc.) are adequately verified
- The information provided by the applicant's field monitor usually provides the basis of this documentation.

FEMA Responsibility

- FEMA has the authority to monitor an applicant's debris operations, whether they be performed by an applicant's force account or contract.
- Often, a two-person, FEMA/State team will perform this function. Generally, the PA Debris Team will be staffed by:
 - PA Debris Technical Specialists and PA Debris Monitoring Specialists—generally the most qualified for this role but may need additional support depending on the severity of the operations and number of Specialists deployed to the disaster.
 - Technical Assistance Contractors—often have this expertise
 - Other Federal agencies, such as USACE
- Typically these staff will:
 - Make periodic site visits, depending on the magnitude and complexity of an applicant's operations
 - Assess operations compliance with the terms of the *Project Worksheets*, the contract, and the applicant's Debris Monitoring Plan
 - Review field notes and/or reports prepared by the PA Debris Monitoring Specialist
 - Compile payment and cost documentation for an applicant's operations
 - Prepare a summary report of observations, issues, and resolutions
 - Provide training to PA Debris Monitoring Specialist

Notes:



Debris Monitoring Responsibilities (Cont'd)

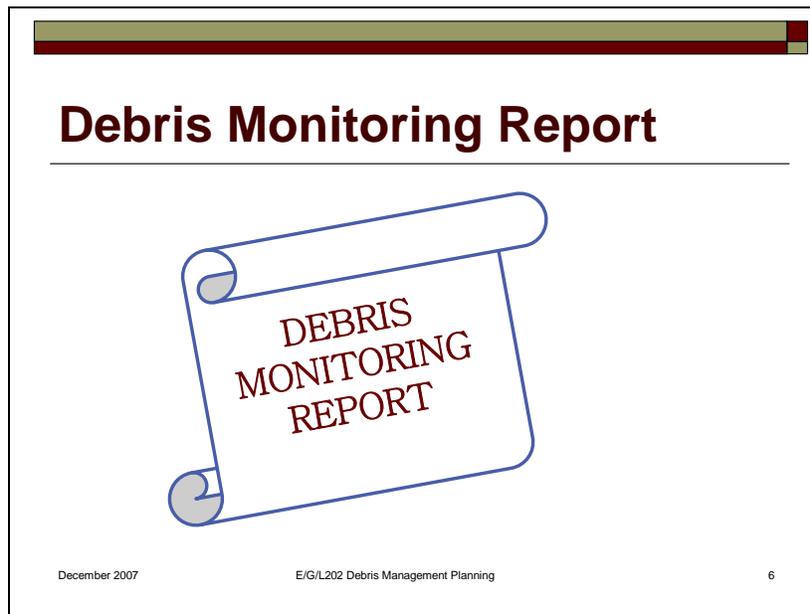
Monitoring Staff

- Force Account Permanent Staff
- Temporary Hires
- Third-Party Contractors

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- The community should employ full-time debris monitors to account for all debris management activities.
 - The community should not rely solely on the records or invoices provided by the contractor.
- These monitors should be trained and properly supervised.
 - FEMA may provide training on Presidentially declared disasters, if necessary.
- The size of the staff will depend on the operation, and may range from a few individuals who randomly monitor pickup and disposal sites (least efficient) to having a monitor at every pickup and disposal site (most efficient, most costly).
- Staffing may be provided by:
 - Local force account labor or temporary hires. Retired employees can be a good resource.
 - What labor costs (overtime or straight time) would be eligible for your staff to meet FEMA’s eligibility criteria in Presidentially declared disasters for:
 - permanent employee?
 - temporary employee?
 - seasonal employees?
 - Indicate that because of the regular time restrictions, many applicants choose to use contractors to perform monitoring activities for declared events.
- Engineering firms usually have staff with construction experience that could provide the monitoring functions (these do not need to be professional engineers). This staff should not be employed by the debris contractor, but rather an independent engineering firm.

Debris Monitoring Responsibilities (Cont'd)



- It is important to develop a monitoring system that includes a systematic method of identifying pertinent activities and recording relevant observations and data.
- A monitoring report should be developed to capture specific debris-related activities, based on the method of payment (force account or contract type) and other issues unique to the community's operations.
- The reports may also be used to assess eligibility of debris-related activities and quantities.
- A sample report used in Texas is provided as Reference: Sample Applicant Debris Monitoring Report. This report indicates the type of items that may be recorded by a community.

Notes:



Debris Monitoring Responsibilities (Cont'd)

Monitoring Program

- Monitor at pick-up locations
- Inspection station
- Use load tickets

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A monitoring program observes and documents the work being done at two locations, minimum—point of collection and disposal (temporary and final). Some items to document at the various monitoring points include:

- Debris Loading Area
 - Eligible debris is being picked up from contract area.
 - If debris types are separated at the curbside, check that the contractor keeps them separated.
 - Truck loads are full.
 - Tailgates are in-place.
 - If sideboards are in place.
 - Time of pickup.
 - Load is reasonably compact—large obstructions are not restricting placement of material. Note that if the loads are not properly loaded or compacted, debris monitors should reduce the rated volume of the truck accordingly.
- Debris Unloading Area
 - Truck size is as reported on the load ticket.
 - Determine proper debris quantities.

- Check time of collection for reasonable turnaround.
- Assure appropriate materials are properly segregated, such as HHW.
- Debris Management Site
 - Record inactive times of contract equipment.
 - If air curtain incinerators are used, assure proper procedures.
 - Assure HHW is properly segregated.
 - Assure safety of personnel around equipment.
 - At a minimum, an elevated inspection station should be used to enable the monitor to look down into the truck to verify both the contents and the load amount.
 - Monitoring should also be performed at the exit point of the Debris Management Site to ensure the load has been sufficiently dumped.
- If the contract is by weight, then there should be a monitor at the certified scales.
- One of the best methods of monitoring is to use a load ticket system as discussed on the next slide.

Notes:



Debris Monitoring Responsibilities (Cont'd)

Contract Monitoring Load Ticket Method

- Four part ticket
 - One part at load site
 - One part at inspection station
 - One part to Contractor
 - One part to Subcontractor
- Payment based on load tickets
 - All four must match

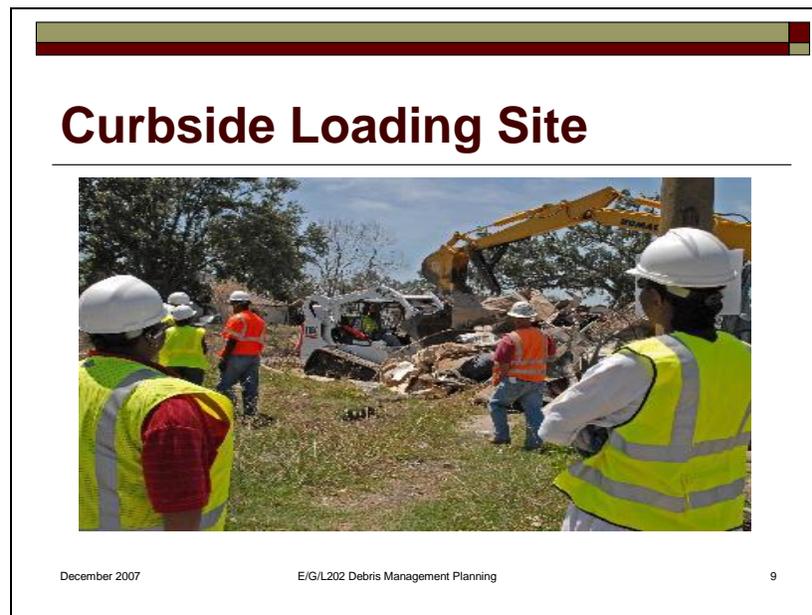
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- Payment under a unit price contract is normally made on the basis of load tickets.
- The load ticket method usually consists of a three- or four-part ticket.
 - The first part of the ticket is completed at the loading site, signed by the monitor, and given to the driver.
 - The driver hands the remaining two parts to the monitor at the inspection station. That person inspects the load, and initials the ticket.
 - One part remains with the monitor, and the other goes to the driver, to be turned in to the contractor's representative.
 - A four-part ticket would include a copy for a subcontractor when used.
- Payment is based on the information contained on the tickets. The contractor must submit tickets with invoices. Payment is made for tickets where all three match.
- Load tickets must be reconciled and entered into a spreadsheet or database at the end of each work period.
- Load tickets become the basis for the invoice submitted for reimbursement.
- There are computer programs and computer hardware packages available in the private sector that automate the load ticket process.
- These systems electronically generate the load ticket, reconcile the tickets, and prepare the required reports real time.

Debris Monitoring Observations



General

- The following slides illustrate various debris activities that require monitoring and items to be aware of.

Debris Monitoring Observations

- If the contractor is conducting operations in several large areas, a second or third inspection team may be required or an inspection site established where all trucks must pass.
- This photograph illustrates a typical curbside loading operation. Note that this crew is using a loader with a grapple. This arrangement makes for the most efficient means to handle woody debris. Moreover, the operator is able to maximize loading.
- Prior to initial loading, trucks should be measured and load capacities documented by truck number. Periodically, trucks should be pulled out of operation and remeasured.
- Monitors should observe operations to ensure ineligible debris is not picked up. Monitors should have a good understanding of eligible debris (especially from private property) and any time limits imposed on pickup of specific types of debris. Examples (from actual occurrences) include sweeping areas for abandoned cars and white goods, cleaning up illegal dump sites, removing cut trees from subdivisions under development, and removing/cutting trees from the right-of-way in rural areas.

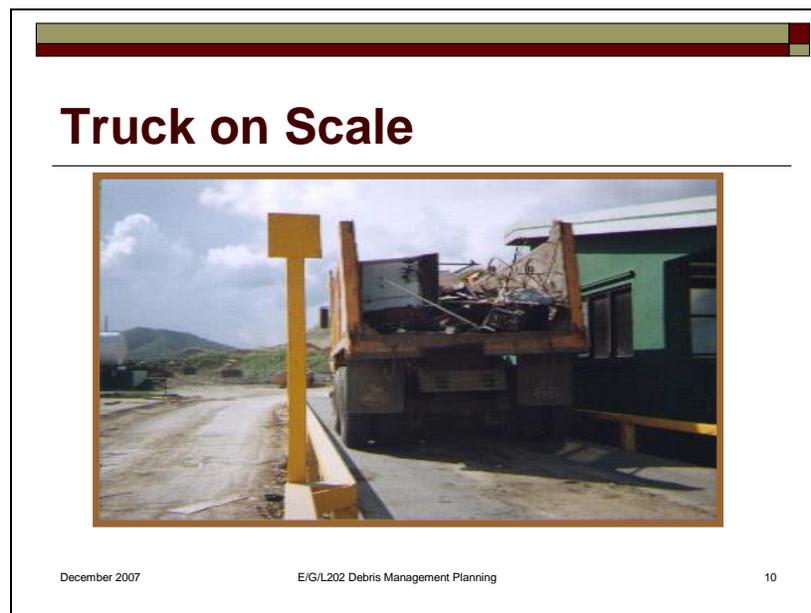
Can you identify various monitoring issues? The items below are some examples.

This picture reflects many debris monitoring issues such as truck and loader backed up in private driveway, citizen standing too close to the loading operation which presents a danger to the citizen, crew members not wearing proper safety equipment, and truck does not have a tailgate.

Notes:



Debris Monitoring Observations (Cont'd)

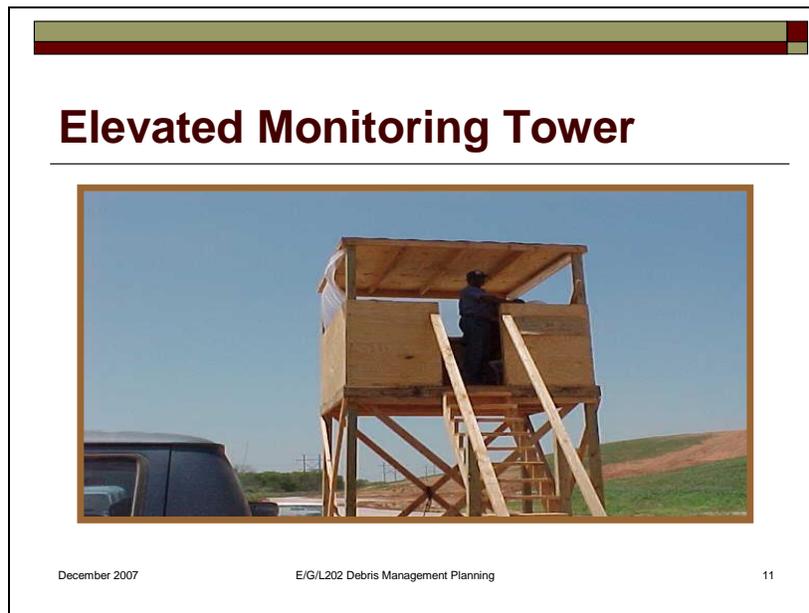


- This photograph illustrates a truck hauling mixed debris going across scales at a landfill.
- It is important to ensure that tare weights (empty) have been taken for each truck.
- Remember that gross weight minus the tare weight equals the net weight. In this situation, the scale house operator was estimating the weight because the scale was broken. If this happens, then the quantity of material should be measured in cubic yards and converted to tons.
- There have been occasions when contractors have added excessive water to debris loads to increase the weight when being paid by the ton. This can be detected during monitoring before the load reaches the disposal site by observing excessive water dripping from the truck bed, or by inspecting the truck bed immediately after unloading.

Notes:



Debris Monitoring Observations (Cont'd)



- This photograph illustrates a typical inspection tower. It must be built high enough to be able to look into the bed of the truck.
- This is the bare minimum site. The contractor operating the site should be required to construct the tower to contract specification and provide for portable sanitary facilities.
- Debris Management Sites should have only one way in and one way out or have an inspection station at the exit. Trucks have been reported driving through the disposal site without unloading, then re-entering with the same load.
 - This can be detected by observing the time of departure and time of arrival recorded on the driver's load ticket.
 - This may also indicate problems with the community's debris monitors at the loading or unloading site.

Notes:



Debris Monitoring Observations (Cont'd)

Inspection Tower with Catwalk



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- This photograph illustrates a combination inspection tower and catwalk.

Notes:



DMS Inspection Station



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- This photograph illustrates a dump truck entering into the Debris Management Site.
 - Note the monitor in the tower.
 - The tower height is almost too low.
 - Note the plastic tailgate. This is not acceptable because it is too flexible. The only acceptable temporary tailgate is one made out of cyclone fence material, spot welded to one side with a means to secure it to the other side.
 - This truck would be rated at only 85% of the measured bed.
- Many States require trucks to have tarps that cover the bed. If a monitor sees a truck without a tarp, he or she may want to take note of the truck number and report it to his/her supervisor. Remember that monitors are not law enforcement officers.

Notes:



Debris Monitoring Observations (Cont'd)



- This photograph illustrates a typical 16-20-cubic yard dump truck.
Note the wooden sideboards. In general, use of sideboards should be discouraged as it makes measuring quantities difficult.
 - If sideboards are used, you must be sure they are in place at loading and disposal locations.
- There have been occasions where trucks have had a heavy steel grating welded 2 to 3 feet above the bed after being measured, reducing the capacity. This can be detected by periodically having the community remeasure the truck.

Notes:



Debris Monitoring Observations (Cont'd)

Less Than 100% Loaded



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- This photograph illustrates an example of a truck entering the Debris Management Site.
 - Note that it is not filled to capacity. It is extremely important that monitors record the estimated quantities based on a percentage of a full load.
 - This truck would be estimated at 90% full capacity.
 - If this is a 30-cubic yard trailer, then 90% of 30 CY = 27 cy.
 - Estimates are made in 5% increments.

Notes:



Less Than 100% Loaded



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- This photograph illustrates an example of a trailer that was originally measured with the sideboards in place.
 - Note that the sideboards have been broken to allow for loading by a small front loader.
 - This trailer is considered 85% loaded.
 - Note the numbers on the truck. This trailer has two numbers on it. Numbering should be distinct for the current operation.

Notes:



100% Loaded



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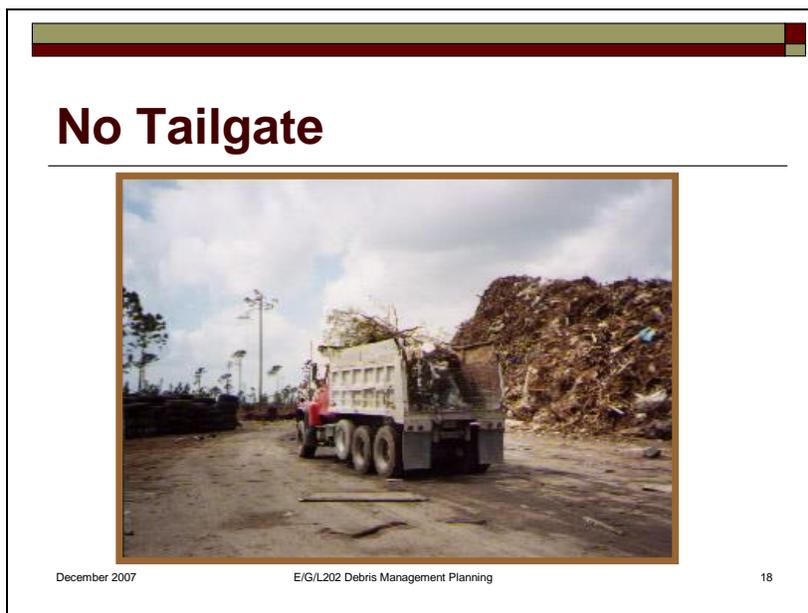
17

- This photograph illustrates an example of a truck that is 100% loaded. The driver would get credit for 18 CY.
- If the truck has material exceeding the capacity of the bed, credit is still only given for the measured bed capacity. The community should never approve more than 100% capacity.
- Do not accept the contention that loads are higher in the middle and, if leveled, would fill the truck.

Notes:



Debris Monitoring Observations (Cont'd)



- This photograph illustrates an 18 CY dump truck without a tailgate.
 - What percentage would you give to this truck?
- Note: Trucks without tailgates, just as trucks with plastic fencing, are rated at 85% of their measured capacity (or only 15 CY in this case).

Notes:



Review Activity 6.1



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Activity 6.1: Monitoring Plan Assessment

- This activity will begin to provide you with the opportunity to apply the teaching points covered in this unit.
- Turn to Activity 6.1 in Student Manual, Volume II (Group Activity Materials).
- Discuss in a tabletop group using the activity information provided in Student Manual Volume II (Group Activity Materials). The instructor will indicate time for completion.

Notes:



ACTIVITY 6.1: MONITORING PLAN ASSESSMENT

Participant Activity Instructions

You have 50 minutes to review the attached Draft Monitoring Plan and complete the Monitoring Plan Evaluation Outline. You may work in your group to complete this activity; however, you must complete your own Monitoring Plan Evaluation Outline. As a group, record your responses on the chart paper. Select a group member to present your responses to the class.

For this activity, you have been provided a:

- Draft Monitoring Plan
- Monitoring Plan Evaluation Outline

Participant Activity Scenario

A recent disaster in your community has resulted in heavy vegetative debris in public areas and rights of way. Your department (Public Works Department—PWD) has hired a debris removal contractor to remove all disaster-related debris from public property within 90 days. The PWD will provide the necessary debris activity monitors and will manage the identified Debris Management Site. The PWD will also contract for the equipment and operators required (chippers, grinders, air curtain incinerators, etc.) at the Debris Management Site.

You have requested one of your staff engineers to prepare a monitoring plan based upon your department's decision to manage the Debris Management Site and the information provided in the debris removal contract.

Participant Activity

Review the attached Draft Monitoring Plan and record the information requested in the Monitoring Plan Evaluation Outline.

ACTIVITY 6.1: MONITORING PLAN ASSESSMENT

Draft Monitoring Plan

1. General:

A Unit Price (CY) Contract will be used to remove disaster-related debris throughout sections of the community. Contractors will pick up the debris and haul it to a designated Debris Management Site. The contractor will work during daylight hours, 7 days/week for approximately 60 days. The contract amount to remove the debris is \$1,600,000.

2. Monitoring Requirements:

The contractor has indicated that to meet the 90-day total removal objective of the community, 9 loaders and 27 – 20 CY dump trucks in continual operation for 60 days should be deployed. The contractors state that having a 60-day contractual objective with allowances for weather and unforeseen circumstances should ensure meeting the 90-day requirement.

It is recommended that the community hire retired Public Works Department staff as monitors. Monitors will be required to supply their own vehicles and will get reimbursement for all meals and supplies needed.

Monitor Requirement

	Zone I	Zone II	Zone III	Total
Site Load Monitors	7	4	2	13
DMS Load Monitors				4
DMS Equipment Monitors				4
Monitor Supervision				4
Total Monitors				25

Responsibilities:

Load Monitors: Provide load tickets to truck drivers at pickup location.

Debris Management Site Load Monitors: Calculate truck capacities and provide final copy of load ticket to truck drivers.

Debris Management Site Equipment Monitors: Monitor operating times and assure efficient operation of Debris Management Site equipment.

Monitor Supervisors: ensure safety practices are being employed, settle conflicts, provide back-up monitoring support in case of absences, visit all monitoring site on regular basis to ensure consistency.

ACTIVITY 6.1: MONITORING PLAN ASSESSMENT

3. Cost estimate:

Labor

Regular Time: (25 monitors) (\$15/hr) (8 hrs/day) (5 days/wk) (8 wks.) = \$120,000

Overtime: (25 monitors) (\$22.50/hr) (4 hrs/day) (5 days/wk) (8 wks) + (25 Monitors) (\$22.50/hr) (12 hrs/day) (2 days/wk) (8 wks) = \$198,000

Total Salary: \$120,000 + \$198,000 = \$318,000

Equipment

Auto: (25 monitors) (100 miles/day) (\$.32/mile) (60 days) = \$48,000

All monitors must supply their own vehicles and will get reimbursement at the Federal Government level for mileage.

Materials

Office supplies: (25 monitors) (\$100/monitor) = \$2,500

Meals: (25 monitors) (\$30/day) (60 days) = \$45,000

Misc: \$1,000

Total Materials: \$48,500

Total Estimate: \$318,000(Labor) + \$48,000 (Equipment) + \$4,500 (Materials) = \$414,500

4. The Community Human Services Office will manage the hiring process. The Public Works Department will provide training, and the Community Finance Office will manage the administrative tasks such as payroll.

Monitoring Plan Evaluation Outline

Use the following outline to help determine completeness of the proposed monitoring plan and to identify issues requiring further information.

I. Scope of Operation

- a. Indicate responsibility for debris removal activities, management of Debris Management Sites and/or landfills**

II. Monitoring Plan Needs Analysis

- a. Type of contract(s) being monitored**

- b. Reasonableness of level of effort proposed**

- c. Monitor locations**

- d. Rationale for monitoring staff requirements**

- e. Monitoring staff organization and responsibilities**

Evaluation and Recommendations:

III. Monitoring Plan Operations

- a. Expedited hiring process**
 - i. Responsible Department for Administrative matter**
 - ii. Knowledge and skills required for monitors**

- b. Training**

- c. Reporting requirements**

- d. Contract Dispute Resolution Procedures**

IV. Monitoring Plan Cost Estimate

- a. Explanation of assumptions and calculations**

- b. Reasonableness of costs**

Evaluation and Recommendations

Unit 7: Debris Contracting Procedures



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E/G/L202-Debris Management Planning

1

Unit Introduction

- The purpose of this unit is to identify applicable contract types for various debris activities.
- Contracting issues that have been identified in previous disasters are discussed in this unit.
- When communities do not comply with proper contracting procedures or enter into inappropriate contracts, severe financial consequences may result:
 - Communities may be obligated to pay a contractor for work that was not intended to be performed but that may have inadvertently become part of the contract.
 - The period of performance may become excessive such that the work is not completed in a timely manner to meet the needs of the community.
 - Lawsuits may result by the community (residents), the contractor, or both.
 - If there is a Presidential declaration:
 - The community may not be reimbursed for all costs incurred, even if payment must be made to the contractor.
 - There may be delays in funding pending the results of audits, collection of documentation, justification of costs, etc.
- Therefore, this unit provides guidance on appropriate contracting procedures and contract types for various debris activities.

Notes:



Introduction (Cont'd)

Objectives

- Identify general contract requirements
- Describe basic types of contracts
- Address contracting issues in debris planning

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Unit Objectives

- Identify general contract requirements
- Describe basic types of contracts
- Address contracting issues in debris planning

Notes:



Debris Contracting Issues and Responsibilities (Cont'd)

Eligible Contracted Activities

<ul style="list-style-type: none"><input type="checkbox"/> Clearance<input type="checkbox"/> Removal<input type="checkbox"/> Demolition<input type="checkbox"/> Recycling<input type="checkbox"/> Debris management sites	<ul style="list-style-type: none"><input type="checkbox"/> Final disposal<input type="checkbox"/> Monitoring<input type="checkbox"/> Asbestos abatement<input type="checkbox"/> Project management<input type="checkbox"/> Household hazardous waste
---	--

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Contracting for labor and equipment may be necessary if the magnitude of the emergency debris operation is beyond the capabilities of local force account resources, State resources, mutual aid agreements, and volunteer labor and equipment.

Possible contracted activities include: *(Review briefly)*

- Clearance, removal, and hauling
 - Separate contracts may be prepared for clearance activities and removal and hauling.
- Demolition
 - Demolition activities are generally beyond the capability of most communities' forces.
- Debris Management Sites
 - Overall operations or specific activities.
- Recycling or Volume Reduction Activities
- Removal and Disposal of HHW, Asbestos, and other hazardous materials
- Final Disposal
- Monitoring
- Overall Project Management *(Note that Project Management costs are sometimes eligible for FEMA assistance, but depend on the magnitude of the event, impact on the community, reasonableness of the costs, and other factors)*

Debris Contracting Issues and Responsibilities (Cont'd)

Preparing the Contract

- Stand-by or sample contracts
- Contracting specialists
- Contractor prepared contracts
- FEMA Technical Assistance

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- To best respond to disaster events, a community may rely on:
 - Stand-by contracts that are pre-awarded, executed, and ready for implementation
 - Sample contracts that are pre-drafted and ready to be finalized, advertised, and awarded
- Many local governments use a contracting specialist to prepare their contracts. The specialist should:
 - Closely coordinate with the debris staff to ensure that all technical aspects are correct and the scope of work is appropriate.
 - Ensure the appropriate type of contract is used for the work to be performed—time and materials, unit price, lump sum (discussed later in this unit).
 - Ensure compliance with proper bidding and award procedures.
 - Be responsible for all contract administration and documentation.
 - A complete file of the process should be maintained, including development of the scope of work, a copy of the bid advertisement, summary of bids received, selection process and basis, invoices, memos of meetings, etc.
- Often contractors will offer use of a contract prepared by their company. Although this offer may seem attractive in the essence of time, the contract should be reviewed by legal counsel to ensure:
 - It is technically and legally correct
 - It has proper safeguards for the awarding entity
 - The work covered by the contract is eligible for reimbursement

- The payment is not being made for technical advice available free from the State or FEMA. This includes instructions on completing project worksheets, eligibility, contracting, environmental requirements, etc.
- While communities may enter into any contracts they wish, and FEMA is not a party to those contracts, they should be strongly encouraged to work with FEMA to ensure that the costs set forth in the contracts they are considering are eligible for reimbursement.
 - To facilitate assistance to communities in this matter, FEMA staff will be available to provide technical assistance before contract execution to help ensure compliance with the provisions of the PA Program, as well as other applicable statutes and regulations.
 - If a contract is in place prior to meeting with FEMA, the terms of the contract should still be discussed to ensure compliance issues.
 - The FEMA Website also has a Fact Sheet entitled “Debris Operations Clarification, Emergency Contracting vs. Emergency Work” that is available to applicants. This document is also included as Reference D. This document will be reviewed later in this unit.
- Regardless of who prepares the contract or provides technical assistance in its preparation, the community is ultimately responsible for the terms of the contract, including:
 - The scope of work is accurate and appropriate.
 - All documentation is complete and appropriate.
 - The work performed is eligible and the costs are reasonable.
 - The work is adequately monitored.

Notes:



Debris Contracting Issues and Responsibilities (Cont'd)

Contract Requirements Procurement

- Follow legal procurement procedures
- For FEMA reimbursement, must meet or exceed Federal procurement standards
 - 44 CFR, Part 13
- Emergency procurement
- Contractor selection

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In large debris-generating events, communities often become overwhelmed with the activities to be performed and do not comply with proper procurement requirements.

- Communities, at a minimum, must comply with all State and local procurement requirements.
- Federal procurement standards must be met, or exceeded, if FEMA assistance is to be requested on Presidentially declared disasters.
 - Title 44 of the CFR, Part 13 covers grant administration, including procurement and contracting criteria.
 - Normal State and local procurement requirements must still be followed, but such regulations must be at least as stringent as the Federal procurement regulations (Part 13).
- To be eligible for FEMA assistance, competitive bidding must be used except for initial emergency situations.
 - Non-competitive (sole source) contracting is acceptable **ONLY** in rare circumstances where there can be no delay in meeting a requirement, such as for emergency road clearance.
 - Not all “emergency” work requires “emergency” contracting procedures. Competitive bidding normally can be resumed within days of the disaster.
- If the Governor waives contracting procedures because of the emergency that does not necessarily mean competition is suspended. It generally means that time can be compressed. Emergency contracting still may require, or can use, competitive bidding.

- In the past, many communities have successfully developed a scope of work, identified contractors that can do the work, and made telephone invitations to bids to expedite the process.

Contractor Selection

- For declared disasters, a community PA applicant is not required to select the low bid in the competitive bid process. The community may use its normal bid evaluation criteria in selecting a contractor.
- 44 CFR Part 13.36(b)(8) Procurement, indicates that consideration may be given to the following factors when selecting a contractor:
 - Contractor integrity
 - Compliance with public policy
 - Record of past performance
 - Financial and technical resources
- In addition, other criteria that may be considered includes:
 - Cost—ensure costs are reasonable. Costs that appear too low may not actually be attainable by the contractor and problems may arise when the contractor is faced with modifying work procedures to cover costs and maintain profits.
 - Other current obligations/work commitments—are sufficient staff available to complete work in a timely manner?
 - Proposed work plan
 - References
 - Use of local resources

Notes:



Debris Contracting Issues and Responsibilities (Cont'd)

Contract Requirements

General

- Use competitive bidding
- Scope of work must be well-defined
- Specifically address each task
- Require detailed documentation
- Include a termination for convenience clause
- Specify a reasonable period of performance
- Make your own estimate of debris

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The following are general requirements to be carefully considered and included in debris-related bid documents and final contracts:

- Use competitive bidding (*discussed in previous slide*)
 - Identify criteria for the work, including
 - Criteria for responding—time, scope of response
 - How long between award and time to mobilize
- The scope of work must be well defined and each intended task specifically addressed.
 - Be comprehensive, but concise.
 - Without specific language for each task, the contractor may perform work that was not originally intended, or fail to perform work that must be redefined often at additional cost.
 - For Presidentially declared disasters, eligible work must be clearly defined.
- Documentation is a critical component in supporting contractor invoices and in supporting FEMA reimbursement.
 - Records should be auditable.
 - Lack of proper documentation can jeopardize or delay FEMA funding.
- Include a termination for convenience clause—this will provide the community the option to cancel the contract for any reason.

- Define a reasonable period of performance.
 - Determine when the work needs to be complete—otherwise the work may not be performed in a timely manner to meet the needs of the community.
 - Include penalties if the work is not completed within the specified period of performance.
- Base the contract on an estimate of debris as prepared by the community staff. Do not rely on contractor estimates.

Notes:

Debris Contracting Issues and Responsibilities (Cont'd)

Contract Considerations for Declared Disasters

If you expect FEMA cost-share:

- Ensure process is fully documented
- Ensure costs are reasonable
- Ensure operations are well-monitored
- Ensure all contracted activities are required
- Request technical assistance from the State or FEMA

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If FEMA funding is involved, or expected:

- Ensure the process is fully documented, including bid advertisement, responses, contract award, etc.
- Ensure the costs are reasonable, and include a justification of costs.
 - FEMA will only reimburse for reasonable costs.
- Ensure the activities are well-monitored and the process of monitoring is documented.
- Ensure that all activities included in the contract are required for debris removal, and are eligible for reimbursement.

If there are any questions regarding any aspects of the contracting, the community may request technical assistance from the State or FEMA.

Notes:



Debris Contracting Issues and Responsibilities (Cont'd)

Contract Cost Estimating

Sources of Cost Data:

- Publications such as Means Cost Data Reports
- Area engineering/construction firms
- Historical data
- Local Departments of Public Works
- State Department of Transportation
- State Department of Forestry

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To estimate a reasonable cost for a contract, the community may consult the following sources for cost data:

- Publications such as Means Cost Data Reports
 - Depending upon what is being contracted, these documents may include costs on specific equipment.
- Local engineering and construction firms
 - These firms can be employed to develop the cost estimate, or may be willing to provide some basic data.
- Historical data
 - These data do not necessarily have to be for the same work, as long as the work is similar. It will provide a guide and some justification of costs.
- Local Department of Public Works
 - This department usually is involved in contracting for various types of work using the same types of equipment needed in debris-related activities.
- State Department of Transportation
 - Most DOTs maintain a comprehensive bid tabulation breakdown showing the average price paid for various contracted work.
- State Department of Forestry
 - May be able to provide input to the estimated cost estimate.

Debris Contracting Issues and Responsibilities (Cont'd)

Contract Cost Estimating

Factors that Influence Contract Costs:

<ul style="list-style-type: none">■ Type of debris■ Method of removal■ Permitting requirements■ Work site limitations	<ul style="list-style-type: none">■ Site access■ Truck size■ Distance and route to disposal site■ Traffic conditions■ Roadway conditions
--	--

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In evaluating a reasonable cost for debris-related activities, various factors must be considered:

- Type, mix, and amount of debris
 - The type and mix of debris will have a significant impact—how much is vegetative, how much is C&D? Is there any asbestos? What about HHW? Is any demolition required? What special handling and disposal requirements must be considered due to the type and mix?
 - The amount of debris will affect the cost. Often, but not always, the larger the magnitude of debris, the less the unit cost.
- Method of removal
 - How will the debris be removed? Front-end loaders and trucks? Is special equipment required?
- Permitting requirements
 - Including permits for handling HHW, to operate Debris Management Sites, for demolition.
- Any limitations at the work site
 - Work hours may be limited, there may be competitive work going on.
 - In some areas, there is a limitation on truck size. In older cities, with narrow streets, small trucks and other equipment will be required. There will be competition for equipment and highway space, so there may be a lack of available trucks. This is a particular problem in the U.S. Territories.

- Access to the debris, the Debris Management Sites, and the final disposal site
 - The type and width of the road may limit the size of equipment that can be used.
 - Access to the Debris Management Site may be limited by lack of access roads.
- Depending upon the type and amount of debris, the haul distance may be lengthy (or take extensive time).
 - As an example after the fire in Los Alamos, New Mexico, there was an extensive amount of asbestos that required disposal in a landfill permitted to take such debris. The closest site was almost 100 miles away. Likewise, in California, hauls of more than 100 miles have been necessary. Debris from a disaster in Seattle would have to be hauled (usually by rail) to the southern border of Washington.
 - Routes may be narrow and winding, increasing haul times.
- It may be necessary to haul the debris through areas of heavy traffic, increasing haul time.
- Roadway conditions may be bad because of the incident, rescue and emergency equipment, and heavy equipment usage.

Notes:

Debris Contracting Issues and Responsibilities (Cont'd)

Bid Solicitations

Don't forget (as appropriate):

- Bond and insurance requirements
- Rights-of-entry and indemnification
- Equipment mobilization/demobilization
- Environmental monitoring
- Safety
- Site clearance/cleanup procedures
- FEMA eligibility determinations

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Finally, in preparing the bid solicitations include the following costs or sections:

- Bond and insurance requirements
 - This is a protection for the community; however, there are costs associated with them.
- The requirement for rights-of-entry and indemnification to enter private property
- Costs of mobilization and demobilization
 - In large disasters, these efforts can be quite costly, but are a cost to the contractor.
 - The work includes organizing the equipment, moving it to the site, then doing the reverse.
- Environmental monitoring may be required
- Safety requirements must be reviewed, and could increase costs
- Debris Management Site clearance and cleanup
 - If a good environmental baseline study is conducted, and a monitoring program is implemented, this should be relatively easy.

Notes:



Types of Contracts

Types of Contracts

- Time and materials
- Unit price
- Lump sum

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Types of Contracts

- It is important for a community to understand the types of contracts that may be appropriate for various types of work.
- There are three basic types of contracts:
 - Time and Materials
 - Unit Price
 - Lump Sum
- Each of these contract types are discussed in the following slides.
- Ineligible contracts will be discussed near the end of this unit.

Notes:



Types of Contracts (Cont'd)

Time and Material Contracts

- Usually used for emergency clearance
- FEMA limits T&M contracts to 70 hours
- Requires comprehensive monitoring
- Idle and standby equipment is not eligible

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Time and Materials

- A Time and Materials contract is based on hourly rates for personnel and equipment.
 - The contractor is paid an hourly rate for the actual time performing the specified work.
 - Bids should include all overhead costs.
 - Stand-by time is not an eligible cost for FEMA reimbursement.
- Time and Materials contracts may be the most appropriate method of contracting during the first 70 hours following an emergency.
- Generally, in the first 70 hours after a disaster, clearing debris from the roadways for access rather than removing debris to disposal areas is the most important activity a community is involved in with regard to disaster debris activities.
 - Communities often use a Time and Materials contract to perform this work.
- All Time and Materials contracts should clearly state:
 - The price for the equipment applies only when the equipment is operating.
 - The hourly rate includes the operator, fuel, maintenance, and repair.
 - The community reserves the right to terminate the contract at its convenience.
 - The community does not guarantee a minimum number of hours.
 - The contract has either a dollar ceiling or a not-to-exceed-number-of-hours clause.
 - The hours of operation of the contractor (to ensure monitoring is on-going when the contractor is working and to minimize disruption to the community).

Regarding Presidentially declared disasters:

- To be eligible for FEMA reimbursement, Time and Materials contracts should be limited to a maximum of 70 hours of **actual emergency debris clearance work** and should be used only after all available local, Tribal, and State government equipment has been committed.
 - The 70 hours provides time for
 - (1) moving the debris from the roadway to the curbsides or rights-of-way to allow passage of emergency vehicles, and
 - (2) negotiating unit price and/or lump sum contracts
 - If a PA applicant awards multiple Time and Materials contracts, those contracts should run concurrently, not consecutively.
 - The 70 hours begins when the first contract is awarded.
- The PA applicant may not exceed 70 hours of actual time for all contracts without a waiver from FEMA, in writing, which can be only for a short period and only if absolutely necessary.
- Relative to emergency contracting issues, FEMA has prepared a Fact Sheet entitled “Debris Operations—Clarification, Emergency Contracting Vs. Emergency Work”. This document is also available on FEMA’s Website.
- Advantages
 - Extremely flexible, not scope-dependent.
 - Has a wide range of uses—clear major access routes or access to critical facilities.
 - Available for immediate response activities—is suitable for emergency “hot spots” and early debris rights-of-way clearance.
- Disadvantages:
 - Requires close contractor oversight and direction as to what work to perform.
 - Requires documentation of actual hours worked by equipment and operators.
 - Requires competitive bids or negotiated reasonable hourly rates for equipment and operators.
 - Specifies equipment as generically as possible to encourage competition.
 - Requires **full-time** (on-site at all times with the contractor) and trained contract monitors to document actual equipment usage.

Notes:



Types of Contracts (Cont'd)

Unit Price Contracts

- Used when tasks are known but quantities of debris is unknown
- Units of measure can be quantified in weight or volume
- Requires comprehensive monitoring

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Unit Price Contract

- A unit price contract uses construction units (Cubic Yards, Tons, Each) and prices to develop line item costs and total contract costs.
- The unit price contract should be used when the scope of work is difficult to define. The contract will be based on estimated quantities.
- There must, however, be specific documentation compiled during performance of the work to support the actual quantity of work completed.
- Therefore, to be properly administered, unit price contracts should have full-time, trained monitors to ensure compliance with contract requirements.
- Advantages:
 - Is flexible—don't need to get an exact determination of the amount of debris (but a good estimate will provide assurance that total quantities are reasonable—estimate should be determined by the PA applicant, not the contractor).
 - Requires accurate account of actual quantities removed in either cubic yards or tons.
 - Ensures a wide range of competition because of simplicity of contract.
 - Has a low risk for the contractor (and great advantages if quantities can be maximized).

- Disadvantages:
 - Proper administration requires dedicated contract monitors at the pickup site and at the disposal site.
 - Collected debris must meet terms of contract and FEMA eligibility criteria.
 - Trucks must be sufficiently loaded.
 - Has possibility of contractor fraud if loading and dumping operations are not closely monitored.
 - Is complicated if segregation of debris is required.
 - Requires all trucks to be accurately measured (for cy payment) or weighed (for ton payment), and numbered—and periodically verified.
 - Requires all truckloads to be documented. For most accurate accounting, a pre-numbered load ticket should be used. Load tickets are the verification of the estimated quantity of debris in cubic yards or tons deposited at the dumping site.
- On FEMA projects, unit price contracts will require the PA applicant to have a verification process in place to help him/her in the documentation for his/her claim.
- When using volume (cubic yards) measurements, an inspection station at the entrance **and** exit of the disposal site is critical in verifying the contractor's loads and to ensure that the load has been fully dumped.
- When using weight (ton) measurements, certified scales must be used.
 - Scales must be certified by a person licensed by the State.
- A systematic method of recording load and measurement data must be in place. Load tickets are normally used as the basis for verifying quantities.

Notes:



Types of Contracts (Cont'd)

Lump Sum Contracts

- Two types **Area** and **Pass**
- Used when the scope of work is easily well defined
- Contractor assumes most of the risk

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Lump Sum

- A lump sum contract establishes a fixed contract price by a one-item bid from the contractor.
- The lump sum contract should be used only when the scope of work is clearly defined by the community (not the contractor), including quantity, type, and location of debris.
 - This information will be used to judge the reasonableness of the cost for reimbursement.
 - Change orders must clearly state the reason for the change; why the debris was not considered in the original contract, the exact quantity, mix and location, etc.
- It is understood in a lump sum contract that the price for the work is fixed unless the scope of work changes; therefore, the bottom line of the contract is not in question, as it is with the unit price contract.
- There are two methods of measurement :
 - Area method
 - Pass method
- The area method of a lump sum contract is used when a defined area is provided.
 - For example, once all the debris within a well-defined area has been placed at the curbside, a scope of work can be written that requires the contractor to conduct a one-time pass to remove all identified material from the curbside and place at a specified location (landfill).

- Area Method Advantages:
 - Provides an easy means of establishing the cost of the work at the time of bid opening
 - Requires minimum labor for monitoring
 - Is easy to monitor as the scope of work is well defined
 - Is easy to determine when the contractor has completed the work
 - The contractor assumes most of the risk
- Area Method Disadvantages:
 - Scope of work must be definable to minimize change orders for additional work.
 - May result in difficulty to quantify the amount of debris that will be brought to the right-of-way for removal.
 - Has a high probability of claims if debris estimates are difficult to estimate and require speculation.
- The Pass Method is used when the scope defines how many passes down a particular street or in a given section of the town will be completed.
 - For example, if homeowners are provided a schedule for placing certain materials at curbside over a specific period of time (3-week duration), a scope of work can be prepared to require the contractor to conduct a minimum number of passes (say three) throughout the community during the 3-week period (say one pass per week) and place the material at a specified location (landfill).
- Pass Method Advantages:
 - Minimum labor required for monitoring and management.
 - Defines the scope of work better than the Area Method and decreases the risk of claims caused by quantity speculation.
 - Quantities do not need to be documented as they do in a unit price contract.
- Pass Method Disadvantages:
 - Must have accurate, up-to-date plans and information on all roads that will be included in the “pass” scope of work.
 - Public must cooperate in the removal process—placing debris on a schedule, segregating materials, placing only eligible debris.
 - Contracting agency must be successful in communicating with the public in removal area.

Notes:



Types of Contracts (Cont'd)

Ineligible Contracts

DO NOT:

- ❑ Award a debris removal contract on a sole-source basis.
- ❑ Sign a contract (including one provided by a contractor) until it has been thoroughly reviewed by your legal representative.
- ❑ Allow any contractor to make eligibility determinations, since only FEMA has that authority.

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The following conditions may result in terms of contracts, and associated work, being ineligible for Federal reimbursement.

- Cost-plus percentage of cost
 - 44 CFR Part 13.36(f)(4) specifically precludes use of this contract type.
 - This type of contract encourages the contractor to exceed the initial cost estimates by basing his/her fee on a percentage of the costs.
- Conditional upon FEMA reimbursement
 - Contracts which indicate a contractor will be paid only upon receiving funds from FEMA are ineligible.
- Contracts with debarred contractors
 - 44 CFR Part 13.35 specifically precludes use of debarred contractors.
 - Communities should check with the State for a current list of debarred contractors.

Notes:



Types of Contracts (Cont'd)

Ineligible Contracts

(DO NOT, Cont'd)

- Accept any contractor's claim that they are "FEMA certified."
- Assume that Debris Management Sites will be required
- Use a debarred Contractor
- Use a cost plus percentage of cost contract

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Ineligible Contracts

(DO NOT, Cont'd)

- Include line item unit costs for stumps that are smaller than 24 inches
- "Piggyback" or utilize a contract awarded by another entity
- Award pre-disaster/stand-by contracts with mobilization costs or unit costs that are significantly higher than what they would be if the contract were awarded post-disaster.

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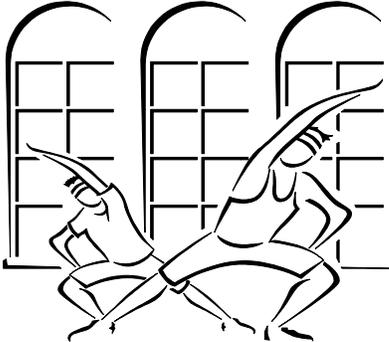
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Notes:



Activity 7.1



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Activity 7.1: Debris Contract Evaluation

- Turn to Activity 7.1 in Student Manual, Volume II (Group Activity Materials).

Notes:



ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

Participant Activity Instructions

You have 70 minutes to complete a review of the attached contract and respond to the questions presented in the Contract Evaluation Job Aid. You may work in your group to complete the evaluation. As a group, record your responses on the chart paper. Be prepared to present your findings.

Participant Activity Scenario

An emergency demolition debris contract was presented to your community by a debris removal consultant after the President declared a major disaster. The contract is based on an emergency resolution adopted by your community to bypass the normal bidding process and to select a sole-source contractor.

Your community's attorney has requested that you review the contract to ensure that the scope of work and terms of the contract are consistent with FEMA eligibility and reimbursement requirements. The attorney has also asked that you identify items in the contract that may place the community or the contractor at a disadvantage.

Participant Activity

You will use following attached documents for this activity:

- Proposed Contract for Emergency Demolition Services Agreement
- Community Resolution No. 001-117
- Contract Evaluation Job Aid
- FEMA Public Assistance Program Fact Sheet—Debris Operations—Clarification Emergency Contracting vs. Emergency Work

**EMERGENCY DEMOLITION SERVICES AGREEMENT
CITY, STATE**

**ARTICLE I
AGREEMENT BETWEEN PARTIES**

This agreement is entered into this _____ day of August, 2001, by and between the City, a political subdivision of the State, hereinafter called the "CITY" and Cut and Haul, Inc., a corporation formed and licensed under the laws of the State, hereinafter called the "CONTRACTOR".

**ARTICLE II
SCOPE OF WORK**

This contract is entered into pursuant to a request for proposal by the CITY for the removal of debris, structural materials and related matter, resulting from damages caused by the Hurricane of July 28, 2001. It is the intent of this contract to provide equipment and manpower, whether directly by CONTRACTOR or by subcontractors hired by CONTRACTOR, to remove all hazards to life and property in the affected portions of CITY.

Clean-up, demolition and removal will be limited to (1) that which is determined to be in the interest of public safety as may be established by resolution of CITY; and (2) that which is considered essential to the economic recovery of the affected area. The work shall consist of the providing of equipment and labor, together with all fuels, lubricants, and other necessary components, to clean up and remove debris as directed by CITY.

It is understood and agreed that 118 homes require demolition (*assume addresses are attached to document*) within the corporate limits of CITY, together with the possibility of additional homes located immediately adjacent to the affected area, but outside the corporate limits of CITY. These non-corporate limit homes are the subject of mutual aid resolutions or agreements between the CITY and adjacent Township, and were damaged by the Hurricane of July 28, 2001.

Work shall be limited to the removal of residential structures or debris from structures, and shall not include commercial properties, specifically including but not necessarily limited to properties owned by Farmers Grain Co-operative, Interstate Shipping Service building, Duncan Auto Sales and Service, or any other commercial structure.

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

ARTICLE III SCHEDULE OF WORK

The work under this contract will commence as soon as reasonably possible after execution of this Agreement, but in any event, not later than August 31, 2001. Work shall be demolition and removal of debris. Work shall be provided at specific properties with direct loading and immediate removal or hauling of debris from each property rather than stockpiling from multiple sites prior to removal of debris from a general area.

Work shall also include securing each site with safety fencing or otherwise as provided by applicable code, whether State or local. Backfilling of sites of excavation and other restoration of properties is not to be provided unless specifically directed otherwise, in writing, at the direction expense of the affected property owner.

ARTICLE IV PRICE

The lump sum price for performing the work stipulated in this contract document is not to exceed Nine Hundred and Fifty Thousand and 00/000 (\$950,000) Dollars

ARTICLE V CONTRACTOR'S OBLIGATIONS

CONTRACTOR shall supervise accomplishment of the work effort directed using skillful labor and proper equipment for all tasks. Safety of the CONTRACTOR'S personnel and equipment, or that of subcontractors, is the responsibility of the CONTRACTOR and subcontractor.

Additionally, the CONTRACTOR shall pay for all materials, personnel, taxes, and fees, if any, necessary to perform under the terms of the contract. Any unusual, concealed, or conditions are to be immediately reported to the CITY.

Caution and care shall be required and exercised by CONTRACTOR or its subcontractors not to cause any additional damage to sidewalks, roads, buildings, or other permanent fixtures, structures, existing utilities, and/or trees. The CONTRACTOR shall be responsible for damages to existing facilities. Any unnecessary damage will be repaired at the CONTRACTOR'S expense.

CONTRACTOR shall provide prompt billing to CITY by property or site affected, unless otherwise agreed with CITY. It is understood that subcontractors shall be retained using local, average and Blue Book prices for construction labor and equipment, with equipment billing rates to be considered wet (with fuels and lubricants included) and also including necessary operators. These rates shall not exceed FEMA approved equipment rates. Billing shall be submitted weekly with amount due as hereinafter provided in Article V.

CONTRACTOR shall be paid an amount equal to ten percent (10%) of all subcontractors' billings to cover the administrative costs of this contract and arranging for such contractors. CONTRACTOR'S foreman, if any, will be billed at an hourly rate.

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

Only actual costs per site, or property affected, will be billed, with the exception of the administrative fee and CONTRACTOR'S foreman or supervisor fee as above-noted.

ARTICLE VI PAYMENT

The CONTRACTOR shall submit certified pay requests for completed work. The CITY shall have 10 calendar days to approve or disapprove, with reasons in writing, the pay request. The CITY shall pay the CONTRACTOR for its performance under the contract within 20 days of approval of the pay estimate. On contracts over 30 days in duration, the CITY shall pay the CONTRACTOR a pro-rata percentage of the contract amount on a monthly basis, based on the amount of work completed and approved in that month. The CITY will remunerate the CONTRACTOR within 30 days of the approved application for payment after which interest will be added at a rate of five percent (5%) per annum. Payments shall be subject to a retainer of ten percent (10%) on each payment. Retainer shall be released upon substantial completion of the work. Funding for this contract is authorized pursuant to Public Law of the State, F.S. 13.27 and City Charter, Chapter 3.

ARTICLE VII CHANGE ORDERS

If the scope of work is changed by the CITY, the change in price and contract time will be promptly negotiated by the parties, prior to commencement of work.

ARTICLE VIII CITY'S OBLIGATIONS

CITY'S representatives shall furnish all necessary information for commencement of the work and costs of any construction permits, and costs for disposal site, to include tipping fees, and authority approvals for all services provided. A representative will be designated by CITY for inspecting the work and answering any on-site questions. The CITY shall designate areas where work is to be performed. Copies of "Right-of-Entry" forms, where they are required by State or local law for private property, shall be furnished to the CONTRACTOR by CITY.

ARTICLE IX TERMINATION

The CITY may terminate the contract for failure to perform or default by the CONTRACTOR or its subcontractors.

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

**ARTICLE X
INSURANCE, BONDS AND INDEMNIFICATION**

CONTRACTOR shall furnish proof of Workers' Compensation Coverage, Automobile Liability Coverage, and Comprehensive General Liability Coverage, Performance and Payment Bonds, for itself and any subcontractors, unless otherwise agreed by separate written document executed by CITY. The CONTRACTOR and its subcontractors shall be solely responsible for any intentional wrongdoing or acts of negligence by themselves or their employees.

CITY

By _____
Mayor

And _____
City Manager

CUT AND HAUL, INC

By _____
President

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

RESOLUTION NO. 001-117

**RESOLUTION DECLARING THE DAMAGE
CAUSED BY THE HURRICANE OF JULY 28, 2001
RESULTS IN AN IMMINENT DANGER TO
HEALTH AND SAFETY ISSUES**

WHEREAS, on July 28, 2001, the City suffered a natural disaster as a result of a Hurricane striking the community; and,

WHEREAS, such Hurricane caused significant damage to both residential and commercial structures within the community; and,

WHEREAS, such destruction, including demolished and partially demolished residential and commercial structures, poses an immediate and substantial danger to the public health and safety and health of persons and property within the community.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL that the CITY declares the damage caused by the Hurricane of July 28, 2001 and the resulting damage to residential and commercial structures poses an immediate and substantial danger to the public safety and health of persons and property within the community.

Adopted by the City Council this 30th day of July, 2001

Mayor

Attest:
City Clerk

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION Job Aid

Date: _____

Contracting Entity: _____

[Reference a specific contract section in response to the following issues]

1. Type of Contract:

- a. Describe the type and terms of contract used and general scope.

- b. Does contract use a prohibited type of contracting method such as a Cost plus Percentage of Cost (CPPC) or Contingency Contracts?

- c. Does contract use an inappropriate contracting method for the type of debris being removed?
(i.e., Lump Sum contract when the scope of work is not clearly defined, Time and Materials for work in excess of first 70 hours)

2. Scope of Work:

- a. Does contract include debris removal from private property?
These types of contracts are rarely justified and will require review by the Public Assistance Office.

- b. Is the Scope of Work vague or too broad?
This may cause misunderstanding or a legitimate cause for a contractor to claim a change order for increased costs.

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

Job Aid

3. Payment Method:

- a. Is the payment method appropriate for the type of contract being used?
 - i. Load Tickets for unit price contracts.
 - ii. Percent completion or number of passes for a lump sum contract.
 - iii. Hourly documentation for a time-based contract.

- b. If Load Tickets are used, does contract explain the control system being used? Is it adequate?

4. Bonding Requirements

- a. Does the contract identify bonding requirements?

Reasonable bonding (Bid and Performance) requirements protect the contracting entity and assure that only financially capable contractors are selected. The lack of these bonding requirements may delay debris removal activities, cause multiple contract solicitations and require expensive legal actions. The Contractor should be responsible for the premium paid to obtain these bonds.

5. Performance Standards

- a. Does the contract clearly establish measurable performance standards?
(quantity of debris removed, number of debris passes, date of completion, etc.)

- b. Does contract have a section for penalizing the lack of contract performance?
Significant daily fines should be established for lack of performance.

ACTIVITY 7.1: DEBRIS CONTRACT EVALUATION

Job Aid

6. Schedule for Work/Notice to Proceed

- a. Does the contract specify a time to commence work from date of Notice to Proceed?

A reasonable time should be set for the contractor to be fully operational. Too long of a period will delay the debris operation and too short of a period may not be reasonable, if a large number of personnel and equipment is required. The evaluation of the submitted contracts should always include a physical inspection of contractor's equipment and listed personnel.

7. Other Issues (As each contract document is unique, list other identified issues of concern):

Unit 8: Developing Your Debris Management Plan



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E/G/L202 Debris Management Planning

1

Unit Introduction

- The purpose of this unit is to introduce the key components in managing debris activities, including:
 - The Debris Management Plan

Concept of the Debris Management Planning

Debris Management planning incorporates actions associated with planning for and implementing debris activities.

Concept of the Debris Management Plan

- Local, Tribal, and State emergency managers are encouraged to develop a Debris Management Plan for their communities in anticipation of potential disaster events.
- The primary purpose of the Plan is to define the roles of essential agencies and personnel necessary to execute debris clearance, removal, and disposal activities.
- As part of this Plan, the entity will identify:
 - Critical facilities to which access must be provided
 - Key routes to provide emergency and critical local traffic
 - A process to assess the magnitude and type of debris resulting from an event, and the criticality of its presence

This unit will identify the purpose and contents of a Debris Management Plan, the key components of debris activities that the Plan must anticipate, and will provide you with the opportunity to consider applicable content for a Debris Management Plan for your community.

Introduction (Cont'd)



Objectives

- Describe the purpose of a Debris Management Plan

- Identify the components of a Debris Management Plan

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Unit Objectives

- At the end of this unit, you will be able to:
 - Describe the purpose and contents of a Debris Management Plan.
 - Identify the components of a Debris Management Plan.

Debris Management Plan Development

Developing the Plan

“Planning is worthless; however
the planning process is priceless.”

General Dwight D. Eisenhower
June 4, 1944

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- This statement made by General Eisenhower suggests that plans themselves do not always work the way they are intended, especially if you cannot control all the elements; however, a proper planning process requires consideration of all the elements. If pertinent elements of the plan are properly considered during the development, the plan will provide a basis for rapid modification as things change.
- As most communities have experienced or observed, major natural disasters can generate enormous volumes of debris in short periods of time—often presenting unanticipated conditions.
 - Proper planning allows the flexibility to accommodate a range of conditions in disaster response.
- The following section identifies the process of preparing a Debris Management Plan and the primary components of the Plan.

Notes:



Debris Management Plan Development (Cont'd)

Debris Management Plan Development

- ❑ Coordination is essential
- ❑ Both internal and external
- ❑ Necessary to maintain updates
- ❑ Minimizes implementation problems
- ❑ Incorporates local perspectives
- ❑ Promotes diverse and innovative solutions

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- Numerous resources with varying responsibilities will be involved with the development and implementation of the Debris Management Plan.
- Proper identification of the entities and coordination is essential to the success of the Plan.
- Coordination must be both external and internal.
 - **External** agencies may include:
 - State Agencies
 - Division of Emergency Management
 - Department of solid Waste Management
 - Department of Transportation
 - Department of Environmental Quality
 - Department of Air Quality
 - Federal Agencies
 - FEMA
 - U.S. Army Corps of Engineers
 - U.S. Fish and Wildlife Services
 - USDA, Natural Resources and Conservation Service
 - Federal Highway Administration
 - Local Community Groups

- Local volunteer agencies
- Local environmental and historic groups or organizations
- **Internal** agencies may include:
 - Department of Public Works
 - Department of Solid Waste Management
 - Department of Public Safety
 - Department of Environmental Quality
 - Public Affairs
 - General Counsel
 - Procurement
- A system must be in place to identify and coordinate any updates to the Plan.
- Proper coordination minimizes implementation problems. If each agency has a part in developing the plan, it should be aware of its requirements.
- The Plan should incorporate local perspectives and conditions—what is appropriate in one County may not be appropriate in another.
- Communication promotes diverse and innovative solutions:
 - For example, there may be solutions to reducing and disposing of debris that are not immediately obvious (using mulch from ground-up vegetation to add organic matter to reclaimed strip mines in old mined areas).

Notes:



Debris Management Plan Development (Cont'd)

Debris Management Plan Organization

- Incident Command System (ICS)
 - Use mandated by HSPD-5 HSPD-8 for use by States and Local Jurisdictions
 - Basis for organization
 - Accepted tool for managing disasters

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The organization is very critical. There must be a logical organizational structure established that allows maximum controlled flexibility.

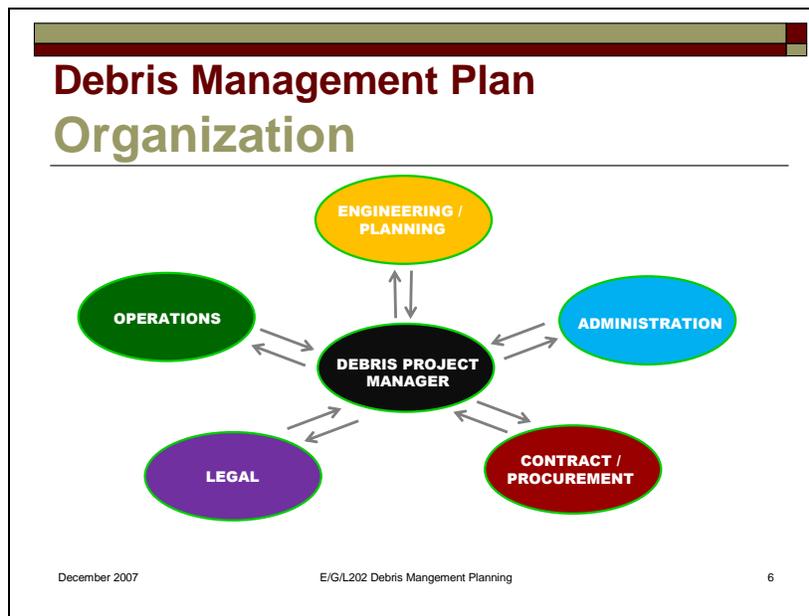
- The Incident Command System (ICS) is well-documented and tested as a model tool for commanding, controlling, and coordinating a disaster response.
 - It provides an excellent means of coordinating the efforts of several agencies to achieve a common goal.
 - The ICS is used by numerous States, agencies, and departments for, among other things, disaster response.
- The ICS is not part of this course, although components will be used and discussed

When preparing the organization, the following should be considered:

- The individual put in command with the overall responsibility must be:
 - Fully knowledgeable about debris activities and the Debris Management Plan.
 - Authoritative—have the ability to clearly direct activities and have individuals respond in a positive manner.
 - Decisive—able to make logical decisions in fluid situations.
- When the organization chart is developed, all parties should be clear about the chain of command and the need to coordinate between the sections.
- The organization must be established in a manner to be flexible—the size and composition should be disaster dependent.
- Key positions should be clearly defined, with responsibilities clearly established.
 - Each position should have clearly delineated responsibilities and associated authority.

- Full-time employees should be named to these key positions.
- All available training should be offered to these personnel.

Debris Management Plan Development (Cont'd)



To facilitate debris removal, the Local government should develop an organizational structure that is not only ICS compliant, but also aligned with the various functions associated with debris removal operations:

- Administration
- Contract/Procurement
- Legal
- Operations
- Engineering/Planning

Additionally, it is critical for the Local government to have a clearly identified primary decision maker such as a Debris Project Manager to coordinate debris activities and serve as the single point of contact for all of the functions.

The Local government should also identify secondary and tertiary back-ups in case the primary designated individuals cannot carry out the assigned functions after a disaster occurs.

Notes:



Debris Management Plan Development (Cont'd)

Suggested Sections of a Debris Management Plan

- ❑ **Mission Statement**
- ❑ **Concepts of Operations**
- ❑ **Citations of Legal Authority**
- ❑ **Roles and Responsibilities**
- ❑ **Assessment of Risks and Assumptions**

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This is a sample Plan outline.

Each community will have a unique plan and outline, but the basic content should cover these subjects.

This plan addresses actions the jurisdiction will take, and at what point supplemental resources will be required, and how those resources may be obtained.

MISSION STATEMENT:

- The Debris Management Plan should begin with a Mission Statement:
 - The Mission should be a clear, concise paragraph that identifies how the debris management activities will be facilitated and coordinated.
 - The Mission should identify local situations and assumptions.

CONCEPT OF OPERATIONS:

- The Concept of Operations section defines who has the overall responsibility of managing the debris clearance, removal and disposal activities, and supporting agencies/staff.
 - Simply stated “How are you going to conduct the debris activities after a disaster?”
- Sub-sections might include:
 - A clear statement of the purpose of the plan
 - How the plan will be implemented
 - Guidance for each phase of the plan

- Debris removal priorities
- Debris Management Site selection criteria
- Cooperative agreements
- Environmental and historic preservation compliance aspects

ROLES AND RESPONSIBILITIES:

- Some of the responsibilities that are sometimes overlooked include:
 - Who is responsible for implementing the plan and to what level?
 - Who notifies the staff?
 - Who conducts the initial assessment of the amount and impact of the debris?
 - Who established removal priorities?
 - Who implements stand-by contracts?
 - Who coordinates equipment deployment?
 - Who authorizes opening Debris Management Sites?
 - Who is responsible for ensuring environmental and historic preservation compliance?
 - Who coordinates documentation?
 - Who coordinates with State and Federal disaster agencies? Volunteer agencies?
 - Who handles traffic control?
 - Who is responsible for supervising the debris monitoring effort?
 - Who responds to citizen inquiries?
 - Not all of the agencies are common to all entities, and some of the responsibilities listed may apply to other agencies in specific communities. This list is provided to identify types of agencies typically available to provide various tasks. Individual communities should consider their own internal agencies and tasks to be performed, and assign responsibilities accordingly.

Primary Coordination Agencies:

- Office of Emergency Preparedness
- Department of Public Works
- Department of Solid Waste Management
- Engineering/ Planning Division
- Law Enforcement
- Fire/EMS

- Code Enforcement/Building Inspector
- Office of Environmental Compliance
- Public Information Specialist
- Department of Legal Affairs
- Procurement/Contracting Office
- Finance/Purchasing
- Human Resources

ASSESSMENT OF RISKS AND ASSUMPTIONS:

Historical data is most often used to determine the design event for hurricanes, tornadoes, ice storms, wildfires, and floods.

Local government may only need to plan with the assumption that a portion of its structures will be damaged or destroyed during a disaster event, rather than all of its structures, if more stringent seismic building codes and better construction practices have been adopted since a previous event of the same nature.

Terrorist events have limited historical data; information from natural disasters and/or analyzing vulnerabilities of a particular Local government's jurisdiction may provide useful insight into the challenges a local government could anticipate.

Understanding the local land use provides information as to the types of debris that will be generated and offers insight as to the type of handling that would be necessary to safely manage the debris. For example, rural areas may have more vegetative debris; whereas, urban residential areas may have more construction and demolition debris. Industrial areas may have special environmental concerns compared to parks/recreation areas.

Evaluating accessibility and terrain of various locations within a jurisdiction is critical to determining the types of debris collection program that should be undertaken. Remote areas may require safely storing the debris until accessibility is established. Usually, finding debris contractors, recyclers, or disposal in remote areas is a challenge. To promote expedient recovery efforts, planners should identify and maintain lists of available recyclers, debris contractors, and disposal facilities.

Historical records provide a basis for forecasting disaster-generated debris and can be used for planning purposes. Previous contracts for debris removal, recycling activities, volume-reduction processing, and landfill disposal records should be reviewed thoroughly to determine the quantity of disaster debris that was generated for a particular disaster event.

If previous disaster data is not available, assumptions may be made from neighboring government's experience, USACE modeling (for hurricanes), or HAZUS (for earthquakes).

USACE emergency management staff has developed a modeling methodology designed to forecast potential amounts of hurricane-generated debris.

The use of remote sensing information (aerial photographs, satellite data, etc.), either alone or in combination with field surveys, may be of significant use in forecasting the amount, mix, and extent of debris.

Notes:

Debris Management Plan Development (Cont'd)

Suggested Sections of a Debris Management Plan

- ❑ **Debris Collection Strategy**
- ❑ **Landfill, Recycling, Debris Management Sites**
- ❑ **Force Account Resources/Contracted Services**
- ❑ **Private Property Removal and Demolition**

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The fundamental component of a disaster Debris Management Plan is the collection of debris.

The debris collection strategy should establish debris collection priorities based upon response and recovery needs.

There should be a systematic method based on clearly defined criteria as to scheduling debris removal routes. For example, population density, location of critical facilities, and environmental justice issues need to be considered when prioritizing which areas will be cleared first (schools v. nursing communities v. affluent neighborhoods, etc.).

Other factors such as air quality, noise, traffic patterns and environmental impacts should also factor into the collection method.

There are several methods that local governments can use to collect disaster debris. The most common collection methods include curbside collection, drop-off bins, hazardous waste round-ups, and white goods pick-ups.

The debris collection strategy should include a list of the types of debris materials that can be recycled. The strategy should also determine which end-use products can be made from disaster debris and identify the end-use buyers.

In determining the types of debris that should be recycled, they should also evaluate the types of processing that would be necessary to convert the debris to an end-use product. If there is no market demand for identified end-use products it will be challenging for local governments to sell or give away their recyclable disaster debris and in some instances, the remaining debris may

need to be disposed. For that reason, it is incumbent upon local governments to thoroughly research the market opportunities for each type of recyclable debris.

If local governments use contracted services to process debris, the contract agreements should include the processing specifications so that the contractor uses the correct types of equipment to achieve that specification.

Local governments should regularly evaluate the efficiency and effectiveness of the debris collection strategy.

Evaluate debris collection routes to determine whether labor and equipment are used efficiently. Based on the results of the evaluation, the local government may need to increase/decrease the frequency of collection or add/remove routes.

Notes:

Debris Management Plan Development (Cont'd)

Suggested Sections of a Debris Management Plan

- Public Information Strategy
- Health and Safety Strategy
- Training and Exercise
- Plan Maintenance
- Appendices

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PUBLIC INFORMATION

The dissemination of debris removal information is critical to the effective and efficient removal of disaster debris. Local governments should have a public information strategy to ensure that residents receive accurate and timely information about the parameters, rules, and guidelines of debris removal.

The information should include the parameters, rules, and guidelines of debris operations so residents can begin their personal recovery activities. The staff responsible for developing and writing the information must present the information in a clear, direct, and organized manner. The language used must be simple and easy for all residents to understand. Jargon and acronyms only lead to confusion and are ineffective.

Information may have to be distributed in more than one language for it to be understood by non-English-speaking populations and neighborhoods.

The public information staff must take advantage of every information vehicle available if power, utilities, and other infrastructure have been damaged. Many times the best carriers of information are the responders in the field. The general public recognizes its role and frequently asks questions regarding the operations. Stocking the equipment and trucks with flyers, pamphlets, and other print media allows responders to perform their duties while also satisfying the public's need for information.

Local governments may also conduct pro-active community outreach initiatives before a disaster, such as public service announcements, handing out flyers/brochures during community events, and public speaking engagements.

HEALTH AND SAFETY

The Debris Management Plan should include a section on safety to establish minimum safety standards for local government and contractor personnel to:

- Avoid accidents during debris recovery operations
- Protect workers from exposure to hazardous materials
- Method of dissemination of safety information, including posters, training of workers, etc.
- How compliance will be monitored
- Specific corrective actions to be taken if minimum safety standards not met

TRAINING AND EXERCISING/PLAN MAINTENANCE

- The Debris Management Plan is considered a living document. Once written, the following actions must be taken:
 - The plan must be approved by the implementing agencies and departments, and adopted according to city/county requirements.
 - The community must ensure there are procedures for providing training.
 - The plan must be exercised to ensure it works.
 - The plan should be dynamic, and reviewed and updated on an established, periodic basis.

APPENDICES

- Some of the information that supports the Debris Management Plan may be included in appendices. The following are examples of information that might be included in an appendix (continued on next slide):
 - A contact list of individuals and telephone numbers
 - Location and status of pre-selected Debris Management Sites (with maps)
 - Location and capacities of existing landfills (with maps)
 - Environmental and historic requirements (or plan)
 - List of stand-by contractors, or pre-qualified contractors
 - Sample contracts or scopes of work. Some entities have one basic contract that covers several potential requirements, with various scopes of work.
 - Copies of stand-by contracts with the individual's name (and backup) that has the authority to implement the contract.
 - Copies of forms: Rights-of-entry and hold harmless letters, letters of insurance coverage, etc.

- Copies of agreements: mutual aid agreements, inter-agency agreements, etc.
- The preparation of maps is an effective tool to ensure all parties are knowledgeable about the location of:
 - Pre-approved Debris Management Sites
 - Permanent disposal sites
 - Emergency routes and facilities
 - Critical routes and facilities on both a local and regional basis
 - Critical environmental and historic sites
- These maps must be updated, as appropriate, and copies made available to appropriate parties, including contractors performing work.

Review Activity 8.1



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Activity 8.1—Debris Management Plan

- Turn to Activity 8.1 in your Student Manual, Volume II (Group Activity Materials).

Notes:



ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

For your own jurisdiction or community, respond to the following questions:

A. Introduction to Debris Management Planning (Unit 1):

1. Would a Debris Management Plan be beneficial for your community? Why?

2. Describe the types of disasters and debris mix that place your community at risk.

3. What departments within your agency are responsible for debris removal? Solid Waste disposal? Demolition? Public Information?

4. What departments within your agency should participate in the development of a Debris Management Plan?

5. What local ordinances have been adopted in your community apply to debris management activities?

6. What staff positions within your agency or department could be designated to coordinate State and Federal assistance for debris management activities?

B. Debris Quantity Forecasting and Estimating (Unit 2):

1. Which departments in your agency could be designated to prepare debris quantities and mix estimates:
 - a. prior to a disaster (forecasting)?

 - b. after a disaster (estimating)?

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

2. What debris estimating methods or resources do you have available? (Aerial, GIS, etc.)
3. What type of training would you provide to the designated departments/agencies?

C. Special Considerations (Unit 3):

1. Name at least three of your facilities that may have significant environmental or historical issues if damaged by a disaster.
2. What departments within your agency would be responsible for permitting burning or incineration operations?
3. Describe your community's existing system for pickup and disposal of Household Hazardous Waste? If one exists, can it be expanded in a disaster situation?

D. FEMA Eligibility and Reasonable Costs (Unit 4):

1. Is any of your current staff knowledgeable of FEMA Public Assistance Program requirements? What additional staff positions should be trained in FEMA program requirements?
2. Who on staff should be responsible for coordinating efforts with FEMA and the State during a Presidentially declared disaster?

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

E. Debris Operations (Unit 5):

1. What are the remaining capacities of your landfills? How would you acquire this information?
2. List any restrictions on the type of materials that can be taken to your landfill(s).
3. Do you have pre-designated Debris Management Site(s)? If not, who would have the responsibility to locate these sites?
4. Do you have a recycling plan? Is your jurisdiction considering a recycling plan? Which agency within your jurisdiction would be responsible for developing and implementing a recycling plan?
5. Do you have a plan for volume reduction? If so, briefly describe it.

F. Debris Monitoring Procedures (Unit 6):

1. Do you have a process or a plan for hiring and training debris monitors? If not, who should develop this plan?
2. Do you have access to a local labor force qualified to perform these functions?
3. What Department/Agency will coordinate these efforts?

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

4. Do you have monitoring report procedures and forms established?

G. Debris Contracting Procedures (Unit 7):

1. Do you have in-place debris contracts prepared?
2. Can you use components of existing contracts, such as garbage disposal contracts or roadway time and equipment contracts for disaster debris clearance, removal, or disposal?
3. Do you have a list of local contractors and their available equipment?
4. What departments within your agency would be required to prepare the debris management bid documents and contracts?

H. Developing Your Debris Management Plan (Unit 8):

1. Who will be responsible for assessing the damage situation and putting the debris management plan into effect?
2. List the facilities in your jurisdiction that would be critical for establishing debris clearance or removal priorities in your Debris Management Plan.
 - a. Emergency (police, fire, hospitals)
 - b. Utilities (electrical, water, sewer, telephone)
 - c. Other

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

3. How often would you recommend updating and maintaining your Debris Management Plan?

4. Prepare a plan outline for your anticipated debris management plan.

I.:

II.:

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

III.:

IV.:

V.:

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

VI.:

VII.:

VIII.:

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

IX.:

X.:

XI.:

ACTIVITY 8.1: DEBRIS MANAGEMENT PLAN

XII.:

Appendices: