Disaster Debris Management

By: Jeff Dickerson, Tetra Tech, Inc.

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Agenda

• Introduction
• Why Is Debris Management Important?
• Understanding the Incident Command System
• Types of Incidents/Debris Forecasting
• Debris Removal Operations – Local
• Debris Operations – Federal/State
• Contracting for Debris Operations
• Special Operations
• Eligibility Issues Post Disaster
Introduction
Jeff Dickerson

- More than 20 years of experience in program management and information technology
- Principal system architect of RecoveryTrac™, our proprietary automated debris management system (ADMS)
- Led deployment and logistics efforts for some of the firm’s largest debris monitoring efforts, including projects in Houston, Texas; Miami-Dade County, Florida; Escambia County, Florida; and the States of Connecticut, Louisiana, Virginia, and North Carolina
Introductions

• Welcome
  – Name
  – Organization
  – Experience with debris management
  – Role in disaster response and recovery
Please Ask Questions!
Why Is Debris Management Important?
Case Study

Terrebonne Parish, LA – Hurricane Gustav

- Households: 35,997
- Land area: 1,255 square miles
- 13,022 hazardous hangers removed
- 1,286 white goods removed
- 1,469 hazardous tree removals
City of Gulfport, MS – Hurricane Katrina

- Households: 26,943
- Land area: 56.9 square miles
- 2,019,320 pounds of hazardous material (pork bellies and chicken carcasses)
- 387 abandoned vehicles removed
- 10,466 linear feet of pool fencing removed
Blanco River Wimberley, Texas
May 2015 Floods
Big Decisions…Little Time

• Call for action to address debris is nearly immediate:
  – Public requests
  – Elected officials
  – Health and safety hazards

• What decisions made by staff will have future impacts?
Activities include:
- Develop/update debris management plans.
- Develop/update hazard mitigation plans.
- Conduct debris trainings and exercises.
- Coordinate with debris contractors to ensure documentation is in place.
- Inventory in-house resource to support debris operations.

Activities include:
- Conduct preliminary damage assessments.
- Activate debris services contractors.
- Conduct 70 hour push.
- Begin truck certifications.
- Attend Applicant Briefing with FEMA Public Assistance Coordinator.
- Identify and assess debris management sites.

Activities include:
- Establish and open debris management sites.
- Attend FEMA Public Assistance Kickoff Meeting.
- Conduct right of way collection.
- Develop FEMA project worksheets.
- Conduct special debris programs:
  - Leaners, hangers and stumps
  - Parks
  - Private property debris removal
  - Waterways
  - Derelict vessels

Activities include:
- Prioritize hazard mitigation projects.
- Implement hazard mitigation strategies.
Public Assistance Alternative Procedures (PAAP) Pilot Program

- Sliding scale
- Regular and overtime reimbursement
- Recycling revenues
- Incentive for an approved Debris Management Plan

<table>
<thead>
<tr>
<th>Debris Removal Completed (From Start of Incident Period)</th>
<th>Federal Cost Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-30 Days</td>
<td>85%</td>
</tr>
<tr>
<td>31-90 Days</td>
<td>80%</td>
</tr>
<tr>
<td>91-180 Days</td>
<td>75%</td>
</tr>
</tbody>
</table>
Why Does Debris Matter?

- Removing debris is costly.
- The Federal Emergency Management Agency (FEMA) has expended or obligated over $8 billion in eligible debris removal costs.
- The table represents the federal cost share only.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total Expended or Obligated for Debris Removal($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$206.9</td>
</tr>
<tr>
<td>2001</td>
<td>$376.3</td>
</tr>
<tr>
<td>2002</td>
<td>$617.2</td>
</tr>
<tr>
<td>2003</td>
<td>$212.6</td>
</tr>
<tr>
<td>2004</td>
<td>$233.3</td>
</tr>
<tr>
<td>2005</td>
<td>$1,316.3</td>
</tr>
<tr>
<td>2006</td>
<td>$2,461.2</td>
</tr>
<tr>
<td>2007</td>
<td>$753.9</td>
</tr>
<tr>
<td>2008</td>
<td>$266.7</td>
</tr>
<tr>
<td>2009</td>
<td>$1,347.3</td>
</tr>
<tr>
<td>2010</td>
<td>$209.6</td>
</tr>
<tr>
<td>Total</td>
<td>$8,001.3</td>
</tr>
</tbody>
</table>
Office of Inspector General (OIG) Open Projects by Office

50 Audits of State and Local Governments Ongoing
Understanding the Incident Command System
National Disaster Recovery Framework

- National Disaster Recovery Framework Recovery Support Functions (RSF)
  1. Community Planning and Capacity Building
  2. Economic
  3. Health and Social Services
  4. Housing
  5. *Infrastructure Systems*
  6. Natural and Cultural Resources
Types of Incidents/Debris Forecasting
# Debris Forecasting

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Nature of Debris</th>
<th>Debris Generation Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricanes and Tornados</td>
<td>Vegetative Construction and Demolition (C&amp;D)</td>
<td>High</td>
</tr>
<tr>
<td>Ice Storms and Straight-Line Winds</td>
<td>Vegetative Limited C&amp;D</td>
<td>Medium to High</td>
</tr>
<tr>
<td>Flood</td>
<td>C&amp;D</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfires and Earthquakes</td>
<td>C&amp;D Limited Vegetative</td>
<td>Medium to Low</td>
</tr>
<tr>
<td>Man-made</td>
<td>C&amp;D</td>
<td>Medium to High</td>
</tr>
</tbody>
</table>
# Hurricane Ike: Debris Generation

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Type of Debris</th>
<th>Estimated Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Beaumont</td>
<td>Vegetative</td>
<td>500,000 cubic yards</td>
</tr>
<tr>
<td>Chambers County (unincorporated)</td>
<td>C&amp;D, vegetative, HHW</td>
<td>1 million cubic yards</td>
</tr>
<tr>
<td>Fort Bend County</td>
<td>Vegetative</td>
<td>500,000 cubic yards</td>
</tr>
<tr>
<td>City of Galveston*</td>
<td>C&amp;D</td>
<td>1 million cubic yards</td>
</tr>
<tr>
<td>Harris County (unincorporated)</td>
<td>Vegetative, limited mix</td>
<td>1.5 million cubic yards</td>
</tr>
<tr>
<td>City of Houston</td>
<td>Vegetative, limited mix</td>
<td>5.6 million cubic yards</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>Vegetative</td>
<td>1 million cubic yards</td>
</tr>
</tbody>
</table>
Debris Removal Operations - Local
Separating Your Debris

Debris should be placed curbside, without blocking the roadway or storm drains.

**DEBRIS SEPARATION**
Separate debris into the six categories shown below.

**DO NOT STACK OR LEAN**
Placing debris near or on trees, poles, or other structures makes removal difficult. This includes fire hydrants and meters.

**UNSURE WHERE TO PLACE DEBRIS?**
If you don’t have a sidewalk, ditch, or utility line in front of your house, place debris at the edge of your property before the curb.

**NO PICKUP ZONE**
Any debris placed from the sidewalk toward your property will not be picked up.

**Normal Household Trash**
Normal household trash and bagged debris of any kind will not be picked up with disaster debris. You should continue to follow your normal garbage removal schedule.

**VEGETATIVE DEBRIS**
- Leaves (do not put in bags)
- Logs
- Plants
- Tree branches

**CONSTRUCTION & DEMOLITION DEBRIS**
- Building materials
- Carpet
- Drywall
- Furniture
- Lumber
- Mattresses
- Plumbing

**APPLIANCES & WHITE GOODS**
- Air conditioners
- Dishwashers
- Freezers
- Refrigerators
- Stoves
- Washers, dryers
- Water heaters

**ELECTRONICS**
- Computers
- Radios
- Stereos
- Televisions
- Other devices with a cord

**HOUSEHOLD HAZARDOUS WASTE**
- Cleaning supplies
- Batteries
- Lawn chemicals
- Oils
- Oil-based paints and stains
- Pesticides

For more information contact your local government.
100 Acre TDSRS - NC
Monitoring Towers
Stacking Clean Vegetation
Debris Stream Separation
C&D Separated from the Debris Stream
Debris Reduction by Grinding
Debris Reduction by Burning
Debris Removal Operations – Federal/State
Primary Federal Partners

- Federal agencies involved in debris operations:
  - FEMA
  - United States Coast Guard (USCG)
  - United States Army Corps of Engineers (USACE)
  - Natural Resources and Conservation Commission (NRCS)
  - Environmental Protection Agency (EPA)
FEMA Roles and Responsibilities Following a Disaster

• Provides technical assistance
  – Environmental and historical review process
  – Reimbursement process

• Assigns federal mission assignments as requested
  – Emergency Support Function #3 - Public Works and Engineering
  – Emergency Support Function #10 - Oil and Hazardous Material Response

• Administers the FEMA PA Program
  – Ensures safety, eligibility, and compliance are maintained
USACE Roles and Responsibilities Following a Disaster

- Primary federal entity for Emergency Support Function (ESF) #3 - Public Works and Engineering
- Responsible for emergency debris clearance and removal
USACE Roles and Responsibilities Following a Disaster

- Removes sunken vessels from navigable waterways under emergency conditions
- Provides strong technical assistance and training support to state and local agencies
- Enables state and local operations to the greatest extent possible
NRCS Roles and Responsibilities Following a Disaster

- Responsible for maintaining natural streams and creeks (unless in a state or national park)
- Provides funding through the Emergency Watershed Protection (EWP) Program
NRCS Roles and Responsibilities Following a Disaster

- Funded through congressional appropriations
- Must have signed agreement with NRCS before work can begin
- Strictly 75/25 cost share; state does not typically provide funding
- Submit for reimbursement as project continues
- FEMA is NOT a second tier funding source for NRCS projects
- Eligible scope of work is broader than PA
Types of Mission Assignments
Issued to EPA

- Conducts sampling of water, air and sediment
- Conducts sampling of drinking water to ensure safety
- Assesses public water/wastewater systems
- Assesses potential emergency conditions resulting from oil and chemical releases, investigates complaints, and evaluates facilities
- Oversees removal of oil from the major, medium, and minor spills
- Oversees cleanups of oil and hazmat emergencies that present public health threats
- Oversees reconnaissance, collection, segregation, staging and disposal of orphan drums, tanks, cylinders, and other hazardous containers
Types of Mission Assignments Issued to EPA

- Oversees collection, bulking, and disposal of HHW, including white goods and electronic goods (E-wastes)
- Prepares and distributes public information for dissemination to facilitate hazardous debris and HHW collection
- Manages acceptance and processing of orphaned containers and HHW collected by the USACE during debris removal activities
- Oversees removal and disposal of impacted laboratory chemicals from public and parochial schools
- Conducts Phase II Environmental Site Assessment to assist with FEMA's Environmental Review of temporary housing sites
- Oversee removal, disposal, and rendering safe of ammunition from the impacted areas
- Oversees removal of fuel from vessels identified by FEMA as being threats to public health due to the volume of fuel and proximity to populated areas
- Oversees demolitions and resultant debris disposal
Other Agencies Involved with Debris Operations

- Farm Service Agency (FSA)
- Animal Plan and Health Inspection Service (APHIS)
- Federal Highway Administration (FHWA)
- Environmental Protection Agency (EPA)
- National Oceanic and Atmospheric Administration (NOAA)
Contracting for Debris Operations
Contracted Services
Is This a Service We Need?
OIG Reports

- Department of Homeland Security OIG Report
- June 2014
- Audit of Hazard Mitigation Grant Program (HMGP) and PA funds
OIG Reports

- Significant issues and noncompliance:
  - Contracting practices
  - Insufficient insurance
  - Legal responsibility
  - Other ineligible costs

Table 3. Ineligible Work or Cost by Type

<table>
<thead>
<tr>
<th>Subtypes of Ineligible Work or Costs</th>
<th>Number of Resulting Recommendations</th>
<th>Amounts Questioned in Our Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contracting Practices</td>
<td>30</td>
<td>$130,245,816</td>
</tr>
<tr>
<td>2. Insufficient Insurance</td>
<td>3</td>
<td>83,679,242</td>
</tr>
<tr>
<td>3. Legal Responsibility</td>
<td>2</td>
<td>7,560,185</td>
</tr>
<tr>
<td>4. Other Ineligible Work/Costs</td>
<td>85</td>
<td>21,118,786</td>
</tr>
<tr>
<td>Totals</td>
<td>120</td>
<td>$242,604,029</td>
</tr>
</tbody>
</table>
FEMA Procurement Disaster Assistance Team (PDAT)

- Formed in 2014
- Will be deployed by HQ following disasters to focus on procurement
- Focus area for FEMA
Contracted Services

Overview

- Procured through competitive bid
- Cooperative purchasing may be an option
  - Understand your state procurement procedures
- Reimbursed at federal:local cost share
- Removal and monitoring contracts cannot be tied to each other or contingent on FEMA reimbursement
- Important to have more recent experience under latest federal guidelines
- Reasonable cost testing
Contracted Services
Benefits

• Staff are able return to normal duties.
• Contractors can bring experience and expertise to operation.
• Additional services/capabilities:
  – Training program
  – Reporting tools
• Transfers safety risk to private firm.
Federal Procurement Guidelines

1. Source contracts must be competitively bid.
2. Must include specific provisions within contracts.
3. Procurements must take affirmative steps to include small, minority, and women-owned businesses.
4. Maintain documentation to support all claimed costs, including those related to the procurement process.

2 CFR 200
Understanding Local Procurement Guidelines

- Understand procurement procedures.
  - Involve your purchasing agent.
- Review other procurements for terms and conditions and scope.
- Is cooperative purchasing an option?
  - Increased scrutiny
  - Reasonable cost testing
- Are your local procurement guidelines as stringent as the Federal guidelines?
Debris Procurement
Considerations Before You Go Out to Bid

• **Duration of the Contract**
  - Base with renewals
  - Cost escalators

• **Selection Committee**
  - Emergency Management
  - Public Works
  - Engineering
  - Finance
  - Purchasing

• **References**

• **Pricing**
  - Understand the staff mix
  - Weight appropriately

• **Scope of Work**
  - Debris removal
  - Debris monitoring
  - Project management
  - Other services

• **Interviews**

• **Evaluation Criteria**
Debris Procurement
Documents Required for Reimbursement

Documentation – Contracted Services
• Request for proposals/solicitation documents
• Proposals submitted
• Executed contract(s)
• Dates worked and type of work performed
• Locations of work performed
• Debris estimates
Special Operations
The tree must be at least 6 inches in diameter when measured 4 and 1/2 feet from the ground and must meet at least one of the following criteria:

- More than 50 percent of the crown damaged or destroyed (as determined by a certified arborist)
- Split trunk or broken branches that expose the heartwood
- Fallen or uprooted within public-use area
- Leaning at an angle greater than 30 degrees
Hanging Limbs (Hangers)

- Must meet all of the following criteria:
  - Must be greater than two inches in diameter
  - Must be suspended in a tree threatening a public-use area
  - Must be located on improved public property
Hazardous Stumps

- Must meet all of the following criteria:
  - 50 percent or more of the root ball exposed
  - Greater than 24 inches in diameter when measured 24 inches from the ground
  - Located on public right-of-way
  - Poses an immediate threat to public health and safety
Right-of-Entry Program Before and After
White Goods Collection and Processing

Contractors processed and disposed of approximately 292,525 white goods from 11 parishes in the State of Louisiana.
White Goods Collection and Processing
E-Waste Collection and Processing
Animal Carcasses

- Eligible FEMA assistance
- Direct federal assistance via mission assignment
- U.S. Department of Agriculture (USDA) assistance
- EPA assistance
- USCG assistance
Waterways

- Sunken debris deposited by surge
- Determination of ownership
- Utilized barges or marsh buggies for collection
  - Side scan sonar for identification
- Throughout bays and canals
Vessels and Vehicles
Household Hazardous Waste (HHW)

- **Household Hazardous Waste (HHW)** hazardous products and materials that are used and disposed of by residential, rather than commercial or industrial consumers. HHW includes some paints, stains, varnishes, solvents, pesticides, and other products or materials containing volatile chemicals that catch fire, react, or explode under certain circumstances, or that are corrosive or toxic.
- Can be segregated curbside, but often communities opt for drop-off programs to handle HHW to keep such materials from being deposited on ROWs.
Citizen Collection Centers

- Provide service to citizens in rural or sparsely populated areas where curbside collection may take longer.
- Provide alternative to challenging residential areas where curbside collection is not practical (streets with low hanging trees or power lines, narrow streets, etc.).
- Provide security to avoid illegal disposal.
Eligibility Issues Post Disaster
Case Study: HHW Eligibility
Reference: FEMA-1008-DR, PA# 037-91012-00

Scenario:
Following an earthquake the Public Works Department directs that HHW be collected and disposed for the constituents.

Consider:
• What documentation should be collected?
• What is threat to the public from the HHW
• Was the HHW caused by the disaster?

What Happened:
• FEMA de-obligated $373K
• HHW Documentation was not provided until appeal was filed
• Appeal was denied on basis:
  – Collection of HHW following the earthquake did not eliminate an immediate threat
  – Providing additional HHW collection was not required as a result of earthquake
  – The Applicant provided normal collection of HHW and thus a normal operating expense
Scenario:
Following a Hurricane the solid waste department directed debris collection be conducted in private gated communities.

Consider:
• Who has legal responsibility for private property debris removal?
• Will the debris removal on private roads server the community at large eliminating an immediate threat?
• Is there a hold harmless indemnification agreement in place?

What Happened:
• FEMA deducted $102K from PW
• Appeal was denied on basis:
  – Agreement to provide routine service does not convey legal responsibility, thus Applicant did not establish they were legally responsible for debris removal on private roads
  – Applicant failed to establish the debris removal served the community at large to eliminate a threat caused by the disaster
  – The Applicant did not provide written hold harmless and indemnification documentation
**Scenario:**
Following a flooding event a sole source, time and materials contract for temporary levee repair was used for hazardous waste debris removal.

**Consider:**
- Are federal contracting standards being followed prior to awarding work to a contractor?
- Has a competitive bid process demonstrated that the work performed is cost competitive?
- Is there a hold harmless indemnification agreement in place?

**What Happened:**
- FEMA de-obligated $3.6MM (4 years after the fact)
- Appeal was denied on basis:
  - Applicant did not follow federal procurement standards
  - The non-competitive contract did not show cost reasonableness
Thank you!

Jeff Dickerson  
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jeff.dickerson@tetratech.com