



## ***Disclaimer***

The following presentation was co-presented by Wes Hare and Ray Williams, Environmental Senior Specialists with the Solid Waste Section Field Operations Branch as part of the Disaster Debris Management Workshop held in Wilmington, N.C. on June 15th, 2017.

Information contained in the presentation may be outdated or superseded since the date of the workshop. Please contact your regional Field Operations Branch Environmental Senior Specialist with any questions and the most current information regarding solid waste management and temporary disaster debris staging sites. Contact information is available at:

<https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/SW/FieldOpMap.pdf>.

Thank you!



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Temporary Disaster Debris Staging Sites*

Disaster Debris Management Workshop

June 15, 2017



## *How We Got Started*



- In response to Hurricanes Fran (1996) and Floyd (1999), Gov. Hunt charged state officials to better organize and prepare for emergency events.
- Since those storm events, NC developed innovative programs for hurricane awareness, planning and response.
  - Executive Order 104 -1996
  - Disaster Recovery Task Force, Action Team

## *Disaster Debris*



- Demolished structures
- Vegetation
- Metals
- Household hazardous waste
- White Goods
- Electronics
- Inerts (concrete, asphalt, etc.)
- Animal Carcasses
- Sediments/Sand



## *Disaster Debris Management – Solid Waste Section Role*

- SERT Infrastructure Support
- Lead regulatory agency on the proper management of solid waste.
- Assist local governments in planning for the management of disaster generated debris.
- Temporary Disaster Debris Staging Sites Program to meet FEMA Public Assistance reimbursement requirements and to provide emergency management options.

## *Winter Weather March 2014*



Permitted facilities and pre-approved temporary sites were not adequate to handle the volume of vegetative debris.



## *Benefits of Preparedness*

- Having pre-approved debris sites, contracts, procedures in place is critical to a quick recovery process and the restoration of vital services (electricity, etc.).
- Ability to move waste quickly can potentially maximize reimbursement.
- Ability to move waste quickly will minimize risks to public safety and the environment by reducing the time that waste remains in place.
- Allows all units of local government to know where debris is to be managed\*
- Allows public information staff to be ready to release information immediately regarding debris management\*

\* *These items were problematic in several areas of Eastern NC during Hurricane Matthew*

# *Disaster Debris Management Options*

## Demolition Waste

- Landfills

- Transfer Facilities

## Vegetative Waste

- Mulching Facilities

- Composting Facilities

- Landfills

## Other Waste

- HHW

- White Goods

- Electronics

Preparing for the scenario where existing facilities are not accessible or operational...





# *Disaster Debris Management Options*

## Temporary Disaster Debris Staging Sites

Preapproved area designated to provide for the temporary storage and/or the initial processing of disaster generated vegetative and/or demolition debris.



# *Vegetative Debris*

## Chipping/Grinding

- Typically Tub Grinders
- 75% reduction in volume



## *Vegetative Debris*

Burning (requires permitting)

- Air curtain pit incineration
- 95% reduction in volume
- Requires management of ash



## *Demolition Wastes*



## *Demolition and Vegetative Waste*



Multiple operations may occur at the same site.

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## *Temporary Disaster Debris Staging Sites*

- Established with a pre-approval process facilitated by the Solid Waste Section Field Operation Branch Environmental Senior Specialists.
- Operated by the county / city / township, NCDOT or contract operators.
- Private contractors operating temporary storm debris sites should have written contracts prepared by local government to ensure proper operation and closure.

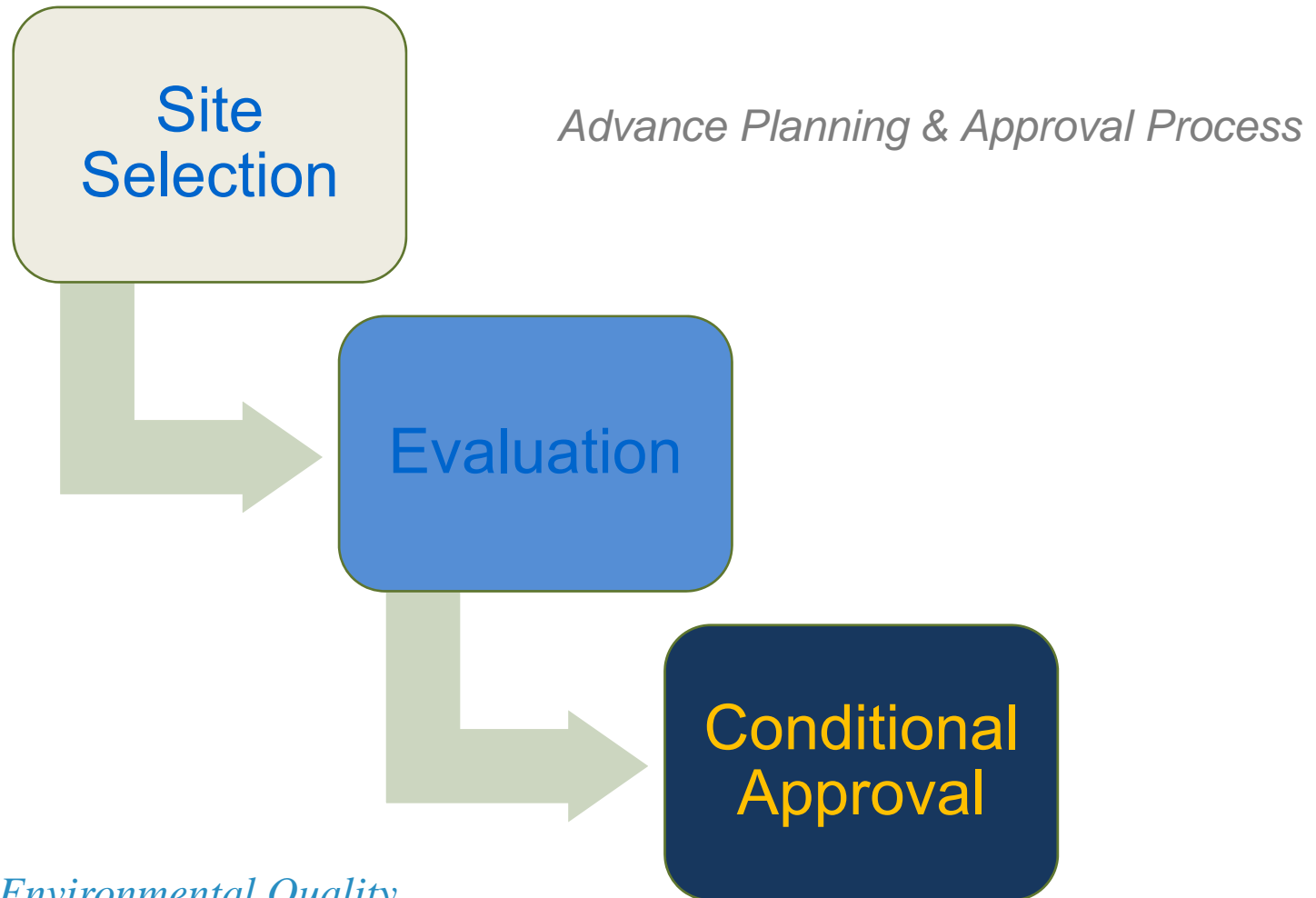
# *Temporary Disaster Debris Staging Sites*

*How Can **You** Establish a Temporary Disaster Debris Management Site in Your Area?*

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# *Temporary Disaster Debris Staging Sites*



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## *Typical Procedure ....*

- County/City/Contractor/Landowner can complete the “Site Evaluation Sheet” form available online.
- It is then sent to the Field Operations Branch Environmental Senior Specialist for the area in which the site is proposed.
- **OR** call Environmental Senior Specialist to assist in identifying potential sites.

## *Typical Procedure ....*

A site visit will be conducted to evaluate for environmental conditions, public safety, site operations.



## *Typical Procedure ....*

- Meet with Environmental Senior Specialist on-site to evaluate, complete form.
- Application forwarded for further review by State Historic Preservation Office (SHPO) and the Natural Heritage Program (NHP).
- If approved, a site ID is assigned.

This does NOT **activate** the site.

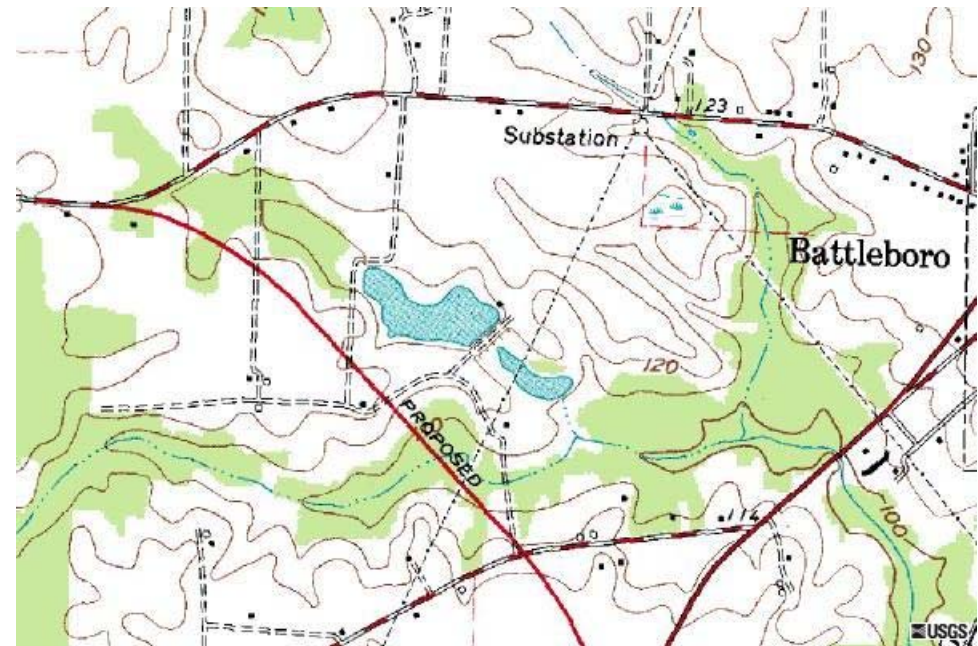
# *Site Activation*

## **BEFORE USING THE SITE...**

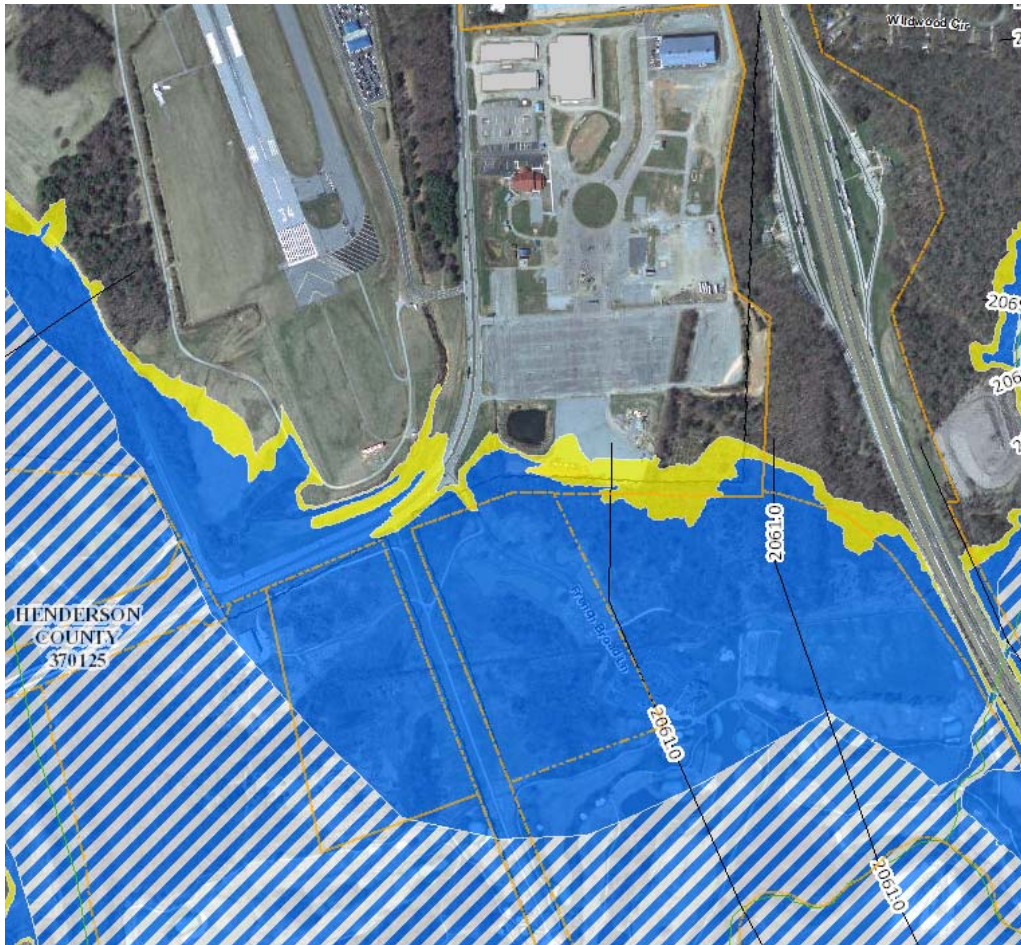
- Contact FOB Representative to have the site *ACTIVATED*.
- A site will only be activated in the event of an emergency. Note- this does not have to be a “declared” emergency.
- Once activated the site is available for use for six months.

## *Locating New Sites*

- Use public land whenever possible - reduces landowner/user conflicts and cleanup liability to private property owners.
- Spread across county - the location of damage can not be predicted (4 sites +).
- Space for safe operations.
- Avoid environmentally sensitive areas.
- Avoid sites that will need to be used by the public or could impact neighborhoods.



## *Locating New Sites*



- Sites with poor drainage or adversely sloped should not be selected, heavy equipment and trucks will bog down or create other safety issues.
- Locate outside of flood prone areas; consult flood maps to verify.

## Access

- Look for sites with easy access to and from main roads.
- Minimize traffic on local streets.
- Avoid populated areas if possible.
- Be considerate of nearby residents - dust, noise, or traffic issues.
- Consider safety issues such as power lines and underground utilities.



## *Site Size*



Adequate room is needed for staging and processing of material. The site cannot be completely filled with debris.

- Smaller sites will require more coordination and manpower but will allow quicker clean up in remote areas
- Smaller sites should be designated for yard waste only.



## *Site Selection - Siting Requirements*

### **100 feet**

Surface Waters/Waters of the State  
Property Boundaries  
Buildings & Structures  
Septic Systems  
Vegetative Waste to potable water supply wells

### **250 feet**

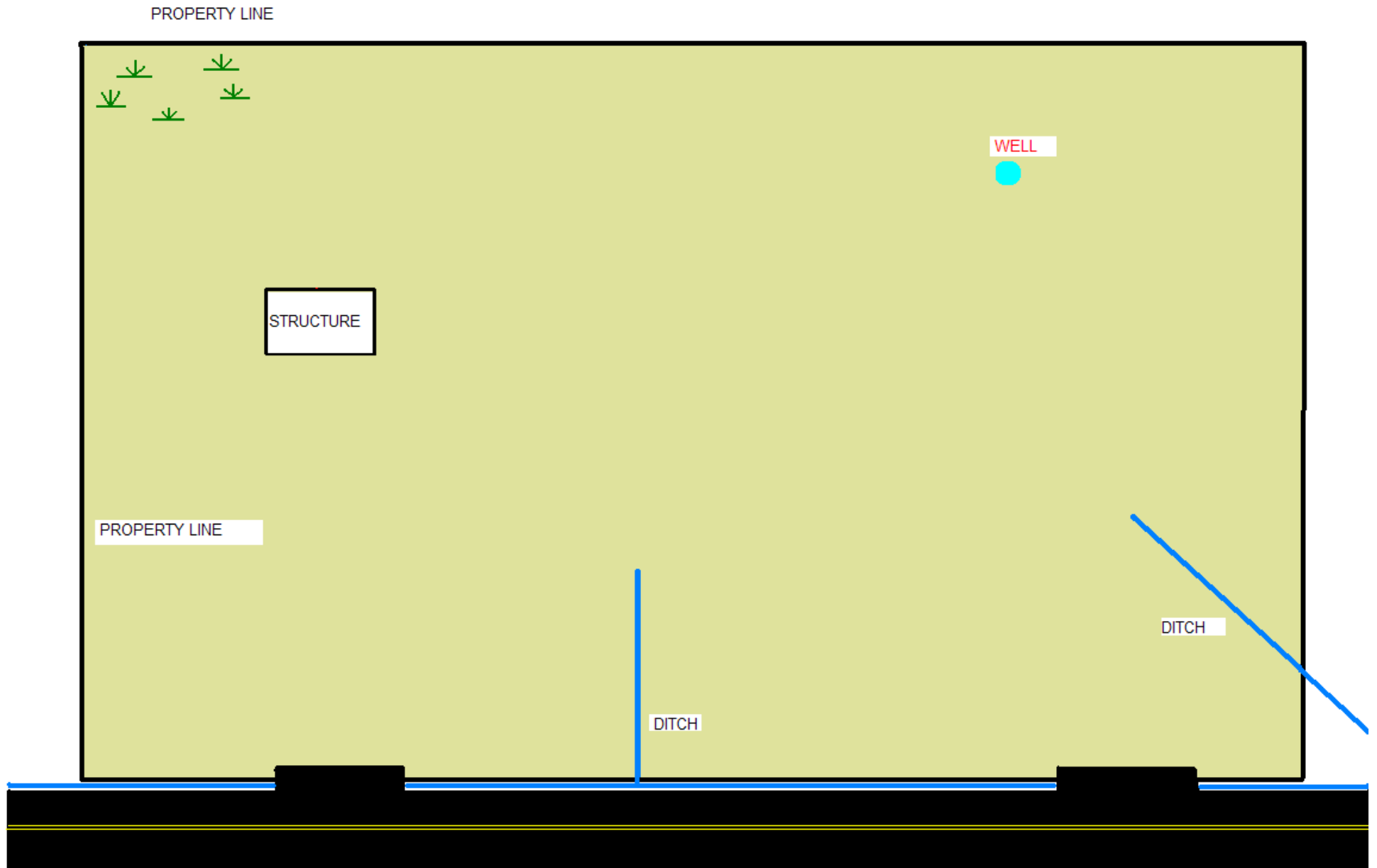
Demolition waste to potable water supply wells

### **300 feet**

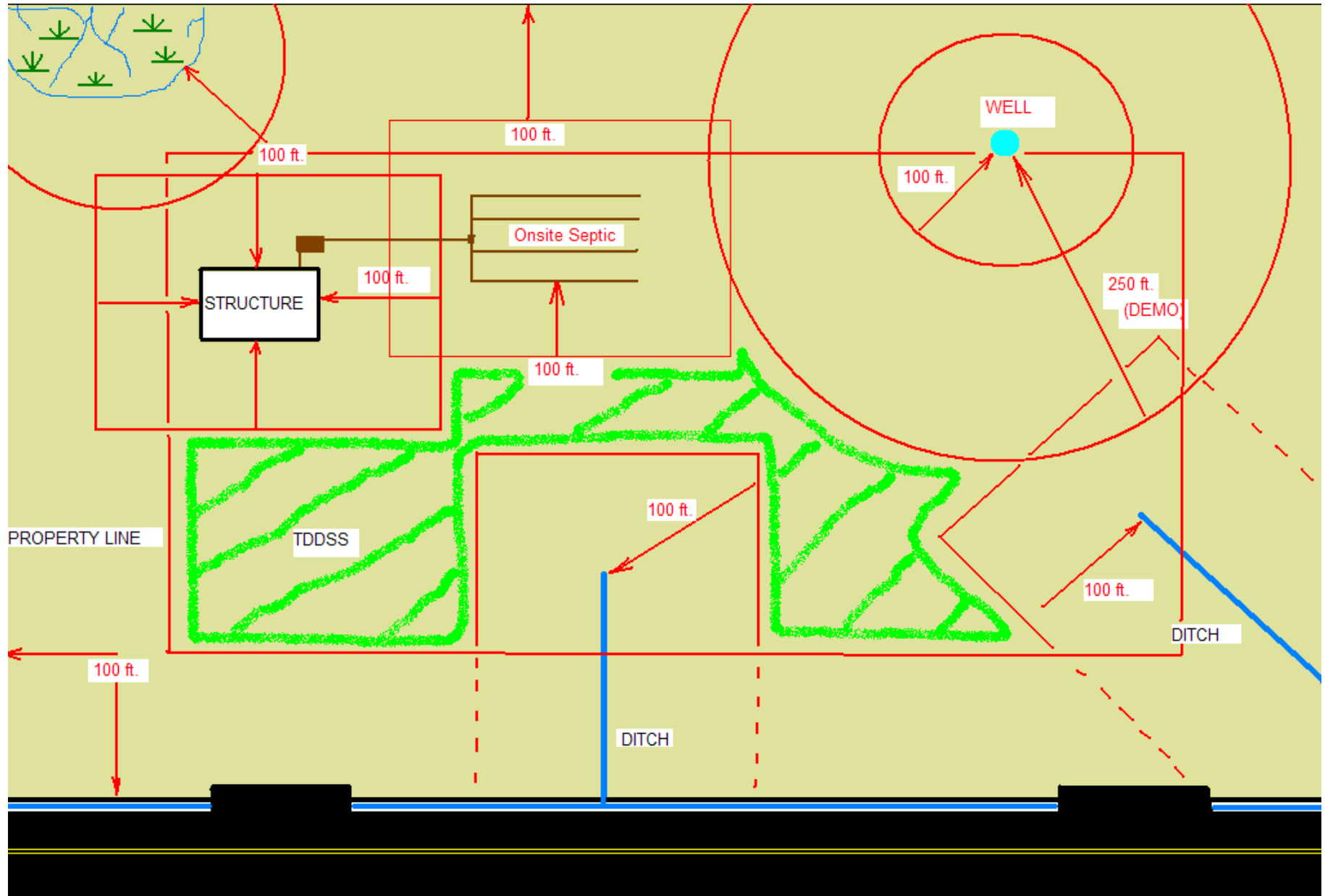
Tub Grinders to structures or locations where property damage and/or personal injury could occur due to airborne debris, vibration, etc.



# Example Site



# Example Site with Setbacks



## *Public Health & the Environment*

- All sites must be selected based on the least potential of possible environmental contamination from disaster debris waste.
- No household garbage, hazardous, regulated or non regulated medical waste can be accepted at any temporary staging site.

## *Public Health & the Environment*

Develop a baseline data for each site whenever possible to include location of any potential problems:

- History of past uses for the property
- Location of closest residences
- Well water or not
- Residents with health problems in area
- Complete set of photographs of site for closure purposes
- Soil samples when possible

These are the types of wastes that can end up at a staging site if proper screening of loads isn't performed. If this type of waste ends up at a staging site the site owner and operator has environmental liability for cleaning and restoring the property.



# *Town of Granite Falls Temporary Disaster Debris Staging Site*



On site Meeting - Environmental Senior Specialist with:  
NC DPS Multi-Hazard Field Planner  
County EMS/Solid Waste Personnel  
Town Planner

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# Town of Granite Falls Site Evaluation Form

## Intended Use of Site:

- Staging/Storage for **Removal**       Staging/Storage for **Chipping**       Staging/Storage for **Burning**

Please provide a brief description of planned operations:

Vegetative debris and white goods to be staged on the ball field. Access will be controlled; the ball field is fenced and gated. The vegetative debris will be transported to a grinding area; mulch will be hauled off-site as it is ground. The white goods will be segregated from other wastes prior to being collected at the street.

## Type of Waste:

- Vegetative** Debris       **Demolition** Debris

Comments:

White goods will be staged in addition to non-vegetative waste.

## Buffers Required (the following must be clearly delineated with flagging, survey stakes, etc.):

- 100 feet from property boundaries and on-site structures  
 100 feet from residences, private wells (vegetative debris only), and septic tank systems  
 100 feet from surface waters  
 250 feet from potable wells (demolition debris)  
 300 feet from grinding operations to residence and business properties, publicly owned roads or properties



# Town of Granite Falls Site Diagram



Diagram Provided by Caldwell County EM Personnel

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## *Temporary Disaster Debris Staging Sites*

Time Needed to Establish a New Site ?

**30 Days !**

In emergencies timeframes may be accelerated, however, in an event with mass damage multiple would be difficult to process quickly.

Advanced preparation *is* **key** to successful disaster recovery.

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## *Disaster Recovery – Where Will the Waste Go?*

Most local governments will not have enough permitted solid waste facilities to handle the debris generated by a disaster.



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## *Site Operation*

- Prior to use, the site buffers should be flagged.
- All temporary sites must be staffed during hours of operation to prevent unauthorized use or dumping.
- All sites will be operated in accordance with current regulations, and the local government sponsoring the site will be ultimately responsible for the proper operation and closure of the site
  - Sites should be operated by the county / city / township, NCDOT or contract operators. It should be clear who is responsible for the operation and closure of the site from the beginning.
  - Private contractors operating temporary storm debris sites should have written contracts prepared by local government to ensure proper operation and closure.
- Segregate waste prior to delivery to site.

At the end of the day waste must be managed by NC regulations **and** EM and FEMA procedures.

# Site Operation

## Vegetative Waste

- Appropriate buffers shall be maintain around grinding operations
- Adequate area around mulch piles.
- Burn sites must operate in accordance with air quality regulations.

## C&D Waste

- Properly segregate.



# Site Operation

## Other Waste

- All unapproved waste will be immediately containerized and/or removed from the site and properly disposed.
- “Clean Wood Fuel” means wood material that has been ground into chips to be used as fuel (e.g. to fire boilers). To be considered “wood fuel” the material cannot contain soil, cannot be treated wood or wood products (e.g. plywood, OSB, pressure treated, painted, etc.), and cannot contain any non-wood material.



A few loads of unacceptable waste mixed in with storm debris.

## *Site Operation*



Debris should not be comingled because it makes processing and disposal more costly, and, could pose a risk to the public and the environment.

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## *Site Operation*



Great space between all windrowed disaster debris.  
Waste accepted well managed.

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## *Site Operation*



Buffers maintained during grinding operations.

## *Site Operation*



How should this waste be managed now?

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## *Site Operation*



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## *Site Operation*



Operators were mining soil without a permit, they decided to dump disaster debris in to open pit.



Operators along with other illegal dumpers from the town, then disposed of other wastes with the disaster debris.

## *Site Operation*



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## *Site Operation*



## *Other Management Options*



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## *Other Management Options*



- SWS issued email/memo to all local govts offering assistance on HHW collection
- HHW Collection / Recycling can sometimes be funded through EPA Emergency Response programs
- Plan one prior to Hurricane season to get the materials out of the residences
- Consider joint municipality/local govt event or even regional
- Human Health and Environment impact of HHW material flooding into streams and rivers but also increased costs to treat water for local govt.



## Local / State Cooperation

### PESTICIDE DISPOSAL DAY

**APRIL 19, 2017**

**10am – 2pm**

**FREE**

Agriculture Center  
200 Glen Road, Troy  
Beside County Jail



Contact Cooperative Extension for more information  
910-576-6011

NC Cooperative Extension

Empowering People • Providing Solutions

- Take advantage of existing programs at state level to handle Ag waste.
- A lot of pesticides/herbicides made it into the waterways during Matthew
- Consider a joint pesticides & HHW event



## *Safety... Fire Prevention*



- Fires require - Heat, Fuel, and Oxygen
  - Remove any component to extinguish a fire.
- Spontaneous Combustion can occur in debris piles:
  - microorganisms generate heat and volatile gases as a result of the decomposition process
  - Larger debris piles have a greater possibility of volatile gases building up and being ignited by high temperatures.
- Temperatures can easily rise to more than 160°F in debris piles.

## *Safety ... Fire Prevention*



- Keep piles small – maintain wind rows 5-6 high and 8-10 feet wide to allow volatile gases to escape.
- Monitor waste piles and turn when temperatures reach 160°F.
- Separate piles with travel lanes spaced for fire fighting equipment.
- Monitor incoming wastes for “hot loads”.

## *Site Closure*

Site will not be considered closed unless the following guidelines are implemented and until the following occurs:

- All Waste Removed
  - All processed and unprocessed vegetative material and inert debris should be removed to a properly permitted solid waste management facility or other approved locations (e.g. fuel delivered to a boiler).
  - All other materials (unrecoverable metals, insulation, wallboard, plastics, roofing material, painted wood, and other material from demolished buildings), including inert debris that is mixed with such materials, shall be removed to a properly permitted solid waste facility (C&D recycling facility, C&D landfill or MSW landfill).
  - White Goods and other metal scrap, electronics, separated and delivered to recycler
  - Ash/residuals should be taken to a properly approved solid waste management site or land applied in accordance with the Division of Waste Management guidelines. Testing, such as a TCLP, of burn residue will determine disposal options.
  - Tires must be disposed of at a scrap tire processing/ disposal facility.
- Site stabilized with erosion control measures, including establishment of vegetative cover, in accordance with regulations of the Land Quality Section

## *Site Closure*

- All temporary storm debris sites are required to be closed within **Six Months** of receiving the first load of debris.
- Sites will not be used for long term stockpiling of debris. Once initial clearing of disaster debris has been accomplished, processing and removal of debris should begin.

## *Site Closure*



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## *Site Closure*



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## *Site Closure*



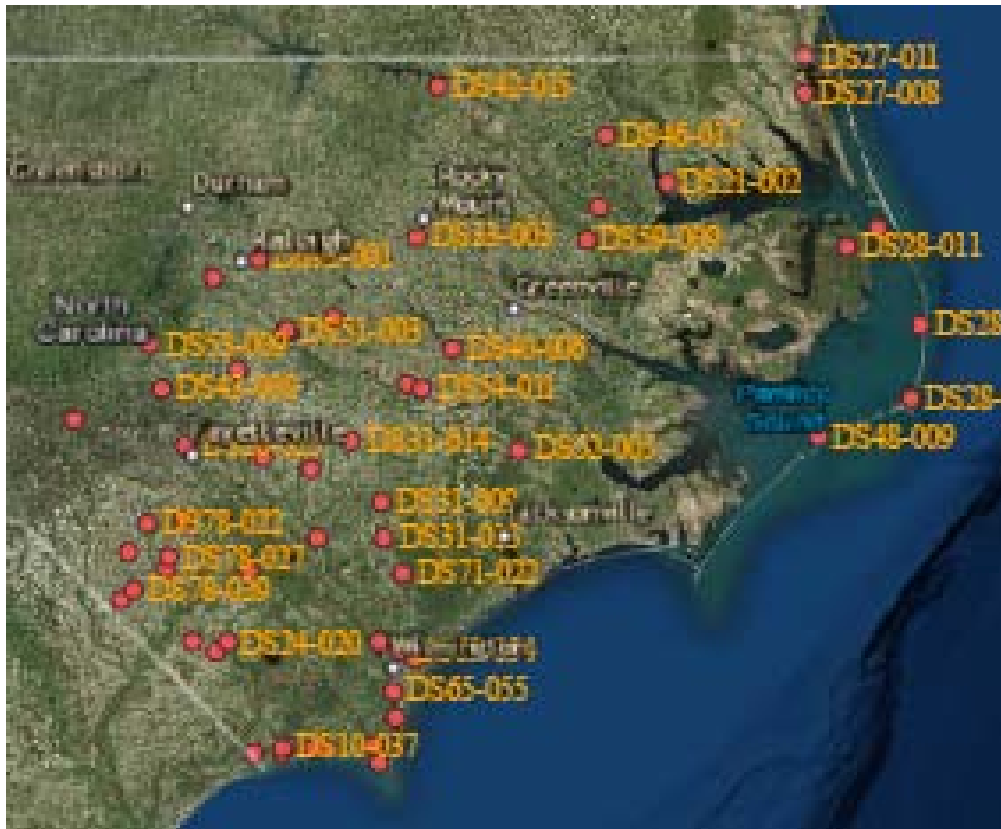
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# Hurricane Matthew Debris Sites

## *DEQ Solid Waste Section*



### Temporary Debris Sites

- **493** pre-approved sites were available statewide before storm – tracking program established in mid-1990s
- **41** additional new sites reviewed in affected areas for Matthew, expedited three-day turnaround for review by state departments of Environmental Quality and Natural and Cultural Resources
- **92** sites have been activated for use in storm clean-up with DEQ assistance and follow-up

### *For Comparison:*

- 125 sites activated for Hurricane Fran
- 59 sites activated for Hurricane Floyd



# Improved Communication - Curbside Segregation

## PICKING UP THE PIECES

Following these specific guidelines when hauling hurricane-related debris and household garbage to the curb will make for a speedier removal process

**WRONG WAY**

**CROSSING THE LINE**  
 ➤ Any debris placed from the sidewalk toward your property will not be picked up. Contractors cannot collect items on private property.

**PROPPING UP**  
 ➤ Do not set debris against trees or poles. Doing so makes it harder for cleanup crews to scoop up the items.

**CORRECT WAY**

Homeowners are being asked to separate debris into the following categories:

- HOUSEHOLD GARBAGE**
  - Bagged trash
  - Discarded food
  - Packaging, papers
  - All garbage should be placed curbside the night before the scheduled weekly pickup.
- CONSTRUCTION DEBRIS**
  - Building materials
  - Drywall
  - Lumber
  - Carpet
  - Furniture
  - Mattresses
  - Plumbing
- VEGETATION DEBRIS**
  - Tree branches
  - Leaves
  - Logs
- HOUSEHOLD HAZARDOUS WASTE**
  - Oils
  - Batteries
  - Pesticides
  - Paints
  - Cleaning supplies
  - Compressed gas
- 'WHITE' GOODS**
  - Refrigerators
  - Washers, dryers
  - Freezers
  - Air conditioners
  - Stoves
  - Water heaters
  - Dishwashers
- ELECTRONICS**
  - Television
  - Computer
  - Radios
  - Stereos
  - DVD player
  - Telephone

**HELPFUL HINTS**

- ➊ Limit curbside garbage to two 32-gallon containers or eight trash bags
- ➋ Share piles with neighbors
- ➌ Refrigerator and freezer doors must be secured with duct tape

Source: Army Corps of Engineers, debris removal contractors

- Pre-prepared press releases, flyers, etc. reduce confusion
- Curbside segregation allows for more recycling opportunities
- Improves collections efficiencies
- Reduces costs – most comingled waste ends up in landfill
- Reduces impacts to facilities (airspace, etc.)



## *Improved Communication – Debris Sites*



- Pre-prepared press releases, flyers, etc. reduce confusion
- TV News spreading incorrect info
- Citizens showing up at wrong sites
- Illegal dumping – County to cleanup
- 6 Small Municipalities since Jan 1
- 1 Private College

# Training / Guidance

1. Debris Site Workshop:  
Wilmington - NCSWANA  
Training Event (June 15<sup>th</sup>)
2. North Carolina Incident  
Waterway Debris Response  
Guide (9/16)
3. NC Debris Removal Quick  
Guidance (Updated 10/16)
4. FEMA Environmental Green  
Sheet (New 10/16)
5. Beach Repair / Mosquito  
Abatement
6. Pre-Disaster Recovery  
Planning Guide for Local  
Governments (Feb 2017)

**FEDERAL EMERGENCY MANAGEMENT AGENCY**  
**ENVIRONMENTAL CONSIDERATIONS GREENSHEET**  
**FEMA-4285-DR-NC**

**INTRODUCTION**

FEMA's Environmental & Historic Preservation (EHP) Specialists are available to assist subgrantees in gathering current environmental and cultural information for informed decision-making during project development and implementation. FEMA is responsible for ensuring that numerous state and Federal environmental and historic preservation laws and Executive Orders (EOs) are or will be met in order to provide project funding.

Early identification of projects having potential EHP compliance issues and coordination with appropriate Federal, State, and Local regulatory agencies is needed to prevent delays in the review, approval, and funding projects.

**Failure to comply with Federal, state, and local EHP laws, executive orders, regulations, permit conditions, etc., including those not specifically mentioned in this document, may jeopardize FEMA's ability to fund a project, and in some cases may involve civil and even criminal penalties. Compliance with EHP requirements should be addressed during every stage of project development, review, and closeout.**

**EVEN IF A PROJECT IS BACK TO PRE-DISASTER CONDITION there are circumstances when actions initiated or completed prior to EHP review may jeopardize FEMA funding. Common examples include projects:**

- Affecting beaches, rivers, lakes, canals, wetlands, or other bodies of water;
- Affecting a 100-year floodplain, or critical facilities in the 500-year floodplain;
- Affecting structures that are 50 years or older, historic or potentially historic places, (including State and National landmarks of any age) or projects that may affect archaeological resources (change in footprint or work in undisturbed grounds);
- Have known or suspected environmental concerns including clean-up or disposal of hazardous materials;
- Located in environmentally sensitive areas such as parks, preserves, near endangered species or their habitat;
- Involving debris staging and disposal (sites must be authorized by North Carolina Department of Environmental Quality (NC DEQ) Division of Waste Management);
- Involving Improved or Alternate projects, Hazard Mitigation, Scope of Work (SOW) changes.



**Federal Laws**

- National Environmental Policy Act (NEPA)
- Endangered Species Act (ESA)
- National Historic Preservation Act (NHPA)
- Clean Water Act (CWA)
- Executive Order for Floodplains (EO 11588)
- Executive Order for Wetlands (EO 11990)

**Project types that may require consultation**

- Changes in scope of work
- Ground disturbance, even within the right of way
- Facilities 50 years old or older
- Debris removal
- Improved or alternate projects
- Any hazard mitigation



# *How much space is needed for debris management?*

- EPA “I-Waste DST” is one tool available to calculate area needed for debris management specific to geographic region.

### Incident Waste Decision Support Tool (I-WASTE DST) [Provide feedback](#)

Welcome to EPA's Incident Waste Decision Support Tool, a decision support tool that organizes large amounts of information related to managing waste resulting from incidents of national significance (e.g., contaminated buildings and natural disasters). The tool can be used by individuals (i.e., emergency response authorities and property owners; tribal, state, and local permitting agencies; treatment and disposal managers; and/or planners) responsible for making disposal decisions. The tool provides access to technical information, regulations, and guidance to work through important waste management issues to assure safe and efficient removal, transport and management of waste materials. Specifically, the tool allows users to:

- Create an incident planning and/or response record;
- Access a waste material estimator;
- Access treatment and disposal facility databases; and/or
- Access guidance and documents.

It is important to understand that the information provided here does not override existing regulatory or legal requirements that apply to the disposal of waste. This information should be used as a starting point for understanding some of the options available for disposal of these materials.

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A UserID and password are required to access the tool. [Request a UserID and Password](#) or enter your UserID and Password to get started. View the [Overview Tutorial](#) to learn more about I-WASTE.

UserID:

Password:

<http://www2.ergweb.com/bdrtool/login.asp>

# How much space is needed for debris management?

## EPA "I-Waste DST" Tool

### Specify Area and Structures:

#### Open Space

Qty:  Total affected area (square miles)

#### Offices

Qty:  Small Office

Qty:  Medium Office

Qty:  Large Office

#### Hospitals

Qty:  Medium Hospital

Qty:  Large Hospital

#### Hotels

Qty:  Small Hotel

Qty:  Medium Hotel

Qty:  Large Hotel

#### Movie Theaters

Qty:

#### Schools

Qty:  Elementary School

Qty:  Middle School

Qty:  High School

#### Shopping Malls

Qty:  Small Shopping Mall

Qty:  Medium Shopping Mall

Qty:  Large Shopping Mall

#### Single-Family Residences

Qty:

#### More Information

- Waste Materials Estimator Tutorial
- Default Parameter Values for Structures
- Modeling Other Structure Types
- Non-Structural/Interior Waste Materials
- Structural Waste Materials
- Waste Materials Estimator and HAZUS-MH



Modify Default Parameters



Clear Quantities

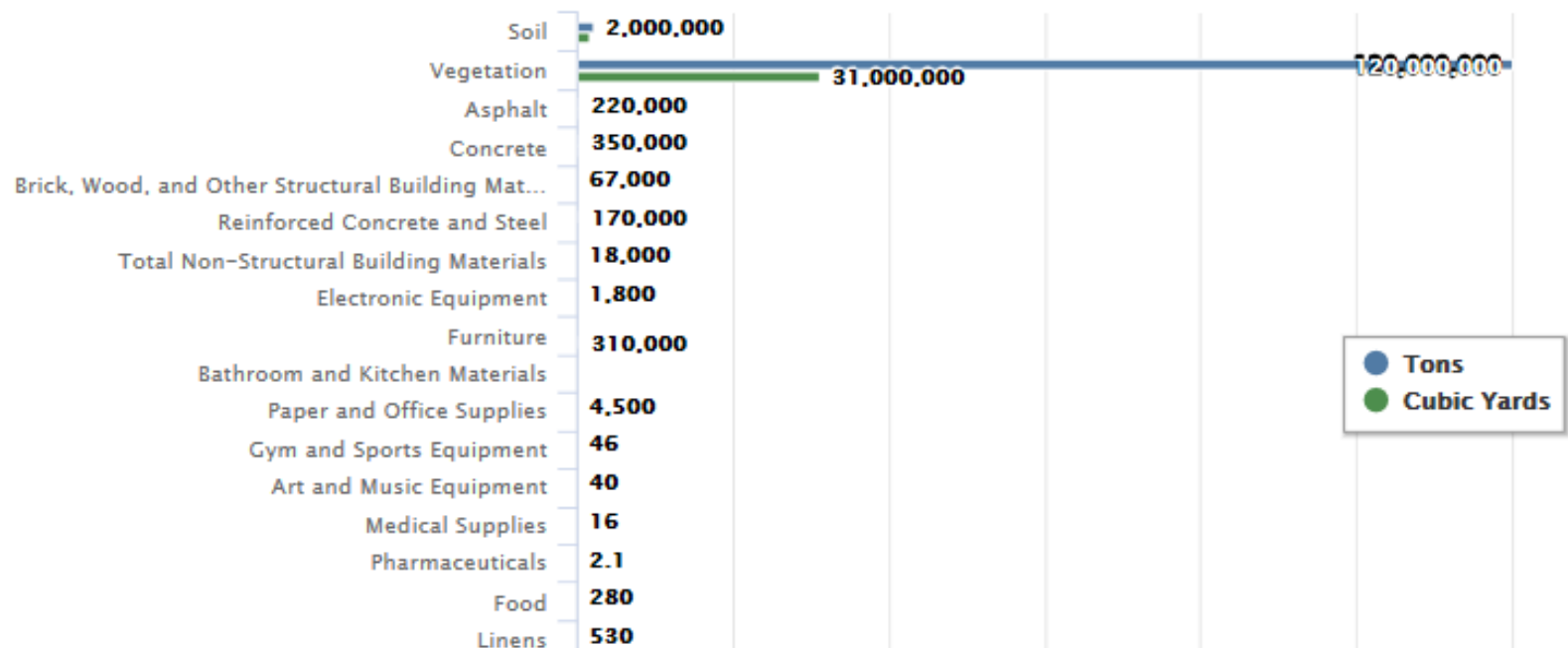


Generate Estimates

# How much space is needed for debris management?

## EPA "I-Waste DST" Tool

Waste Category Quantities and Distributions



1 Acre in square yards = 4840

3-ft by 3-ft column of waste 10-ft high in cubic yards = 3.33333

Total volume of waste in cubic yards per acre = 16133

31,000,000 of vegetation would require: 1922 acres not including buffers and access roads.

<http://deq.nc.gov/about/divisions/waste-management/solid-waste-section>

# Solid Waste Section



**Disaster Debris Management Assistance**

Please contact your regional Environmental Senior Specialist to inquire about training and assistance with Temporary Disaster Debris Site Management.



## Waste Management

[About Waste Management](#)

[Brownfields Program](#)

[Hazardous Waste Section](#)

**[Solid Waste Section](#)**

[Annual Reporting - Local Government and Solid Waste Facility Reporting](#)

[Coal Combustion Byproducts](#)

[Composting](#)



**NC DEQ - DWM**  
**Solid Waste Section - Field Operations Branch**

**Jason Watkins**  
**Field Operations Branch Head**  
**336-776-9674**  
**919-707-8282**

**Compliance Officers**

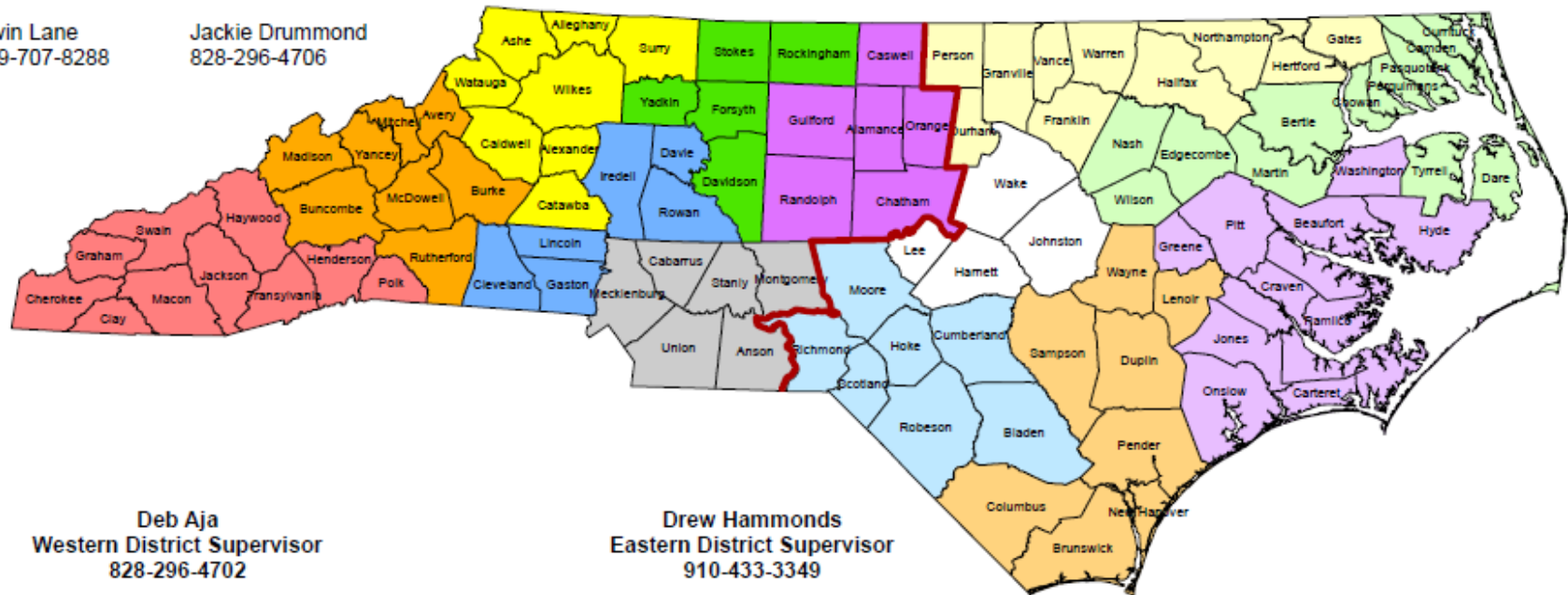
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**Compliance Hydrogeologists**

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- |                                 |                            |                               |                                |
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| John Patrone<br>336-776-9673    |                            |                               |                                |

*Questions? Comments?*



*Thank You!*



*Thank-You!*

<http://portal.ncdenr.org/web/wm/sw>



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