

STATE OF NEW JERSEY EMERGENCY DEBRIS GENERATING EVENT PLANNING AND MANAGEMENT TOOLKIT

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF SUSTAINABLE WASTE MANAGEMENT
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INTRODUCTION

Certain events, such as natural disasters (i.e., hurricanes, tornadoes, floods, severe storms) and manmade disasters (i.e., hazardous materials incidents, acts of terror) may generate more solid waste debris than your county or municipality can handle. The purpose of this emergency debris planning and management toolkit is to provide information on planning and preparing for a debris generating event (DGE). Planning ahead will allow debris removal and disposal activities to be conducted more efficiently and can save you money! Below are examples of some DGEs and the type of debris that can be expected.

DEBRIS GENERATING EVENTS

DEBRIS EXPECTATIONS FOR DGES

| Cause of Damage Type of Debris | Hurricane/ Nor'easter High winds Storm surge Flooding | Tornado ► High velocity winds | Flooding ► High velocity water flow ► River overflow ► Reservoir/ Dam failure | Fire/ Explosion |
|---------------------------------|--|-------------------------------|--|--------------------|
| Vegetative | | | | |
| Sediment | | | | |
| Construction and Demolition | | | | |
| Bulky Solid Waste | | | | |
| Household Hazardous Waste | A | | | |
| White Goods | 10 | 110 | | l lo |
| Vehicles | | | | |
| E-Waste | | | | |

A DGE is a natural or man-made disaster which generates a large volume of debris.

Some examples of DGEs may include:

✓ Hurricanes
 ✓ Earthquakes

✓ Tropical storms✓ Nor'easters✓ High winds

✓ Storm surges ✓ Weapons of mass destruction

✓ Ice or snowstorms
✓ Acts of terror

✓ Fires

These types of DGEs may produce and displace a wide variety of debris. A large-scale DGE may quickly overwhelm a county's or municipality's normal waste disposal operations.

If the DGE affects commercial and/or industrial areas, there is added potential for generating hazardous and/or chemical wastes.

Acts of terror present unique concerns. Debris generated by this type of DGE can be highly variable in quantity and type and may include radiological or biohazard debris. A DGE of this type may necessitate the involvement of law enforcement authorities, the coroner's office, and health officials before the debris is handled.

DIVISION OF SUSTAINABLE WASTE MANAGEMENT WEB PAGE AND E-MAIL

During a DGE, all notifications, correspondence, and questions for the Department's Division of Sustainable Waste Management should be sent via e-mail to: solidwasteemergencies@dep.nj.gov

The Department has a web page for DGE planning and management (www.nj.gov/dep/dshw/debris), which provides information regarding emergency debris management and will also be updated with DGE specific information.

PLANNING

COUNTY & MUNICIPALITY EMERGENCY DEBRIS MANAGEMENT PLANS

The State does not have an individual debris management plan for every county and municipality; therefore, it is up to you to develop a written plan for emergency debris management specific to your community. If your county or municipality does not have a written plan, the Department has developed an Emergency Debris Management Plan Template to assist you in developing your plan. The template is available on our website at: http://www.nj.gov/dep/dshw/debris/template.html.

The purpose of the Emergency Debris Management Plan Template is to provide an outline and starting point for the development and implementation of an Emergency Debris Management Plan. The plan should incorporate all elements involved in managing emergency debris removal operations.

The template focuses on planning for efficiency of debris removal, with an emphasis on Federal Emergency Management Agency (FEMA) reimbursement opportunities. Having a plan in place can expedite cleanups and save you money!

Topics addressed in the template include:

- ✓ FEMA Public Assistance Debris Removal Eligibility Overview
- ✓ FEMA Cost Eligibility Overview
- ✓ County/Municipal Roles and Responsibilities
- ✓ Debris Forecasting for an DGE
- ✓ Environmental and Historic Preservation Considerations
- ✓ Contracted Services
- ✓ Monitoring Debris Removal
- ✓ Debris Collection Strategy
- ✓ Temporary Debris Management Areas (TDMAs)
- ✓ Private Property Debris Removal and Demolition of Private Structures

Your plan should be designed to address circumstances where the normal ability of the County or Municipality to manage debris is adversely affected by large scale or localized DGEs.

GENERAL DEBRIS PLANNING

ESTIMATE HOW MUCH DEBRIS YOU MIGHT EXPECT FROM A DEBRIS GENERATING EVENT

The United States Army Corps of Engineers developed a formula based on population density and land usage to help with debris estimates. However, there's no need for you to calculate this information yourself. The Department has done all the math for you. Just call us, and we can provide you with debris estimates! Want to do the math yourself? The formula for calculating the estimate is attached.

EVALUATE DEBRIS REMOVAL AND DEBRIS MONITORING RESOURCES

Will you rely on your county/municipal workforce and equipment?

If so, all personnel conducting debris operations should be trained on identification of hazards and proper use of personal protective equipment. Personnel should also be trained in identifying different solid waste types, such as household hazardous waste and e-Waste to ensure that all debris is managed properly.

Will you use the state procured disaster debris contracts?

These contracts are available only to those counties and municipalities that participate in the Cooperative Purchasing Partner program.

Will you procure your own contracts?

If the DGE is a Federally Declared Disaster, any contracts you use must be compliant with the FEMA contract procurement guidelines. Using a contract that has not been properly procured may result in loss of FEMA reimbursement.

You don't need to use one option exclusively. You may use one option, or a combination of all three. Whatever option you choose, it should focus on efficiency and cost-effectiveness.

STATE CONTRACTS

The State of New Jersey currently has several State procured contracts to assist counties and municipalities in dealing with DGEs. Links to these contracts are available at www.nj.gov/dep/dshw/debris/contracts.html. The contracts are intended to be used by counties and municipalities that participate in the Cooperative Purchasing Partners program, or by New Jersey State Agencies in certain specific situations. These contracts can be used only during a Federally Declared Disaster or a State, County or Municipally declared emergency, and cannot be used to manage your normal disposal operations.

CONTRACTS ARE AVAILABLE FOR:

- ✓ Land debris removal for disasters
- ✓ Waterway debris removal for disasters
- ✓ Debris monitoring
- ✓ Waterway debris assessment

State Agencies and members of the Cooperative Purchasing Partners program are NOT REQUIRED to use these contracts. Emergency debris removal activities can be performed by force account labor or by another contractor. Cooperative Purchasing Partners should evaluate their options to choose the most efficient and cost-effective option for debris management.

You should be aware that FEMA has specific debris eligibility, documentation, and debris monitoring requirements that must be followed to be eligible for reimbursement for a Federally Declared Disaster. Additionally, should you choose to utilize your own contractor, FEMA also has strict contract procurement guidelines that must be followed (www.fema.gov/grants/procurement).

State, County, and Municipally declared emergencies are generally NOT eligible for FEMA reimbursement. However, sometimes a State, County, or Municipally declared emergency may eventually become a Federally Declared Disaster. If you intend on seeking reimbursement from FEMA for a Federally Declared Disaster, then debris monitoring is required.

PUBLIC INFORMATION STRATEGY

You should think about how you will get important information regarding DGE preparation and debris disposal to the public (i.e. internet, e-mail, text, reverse 911, radio, print, television). At a minimum, the public needs to be informed of the following information: debris pick-up schedules, disposal procedures for residents and independent contractors, enforcement action for illegal dumping, curbside debris separation procedures, public drop off locations for debris. Someone should also be available to respond to any questions or concerns from residents.

EDUCATE YOUR RESIDENTS

It is important to educate your residents and business owners on what they can do to minimize debris prior to a DGE, such as bringing in outdoor furniture or otherwise securing outdoor items. A great resource for emergency preparedness is www.ready.gov.

The Department has additional information on managing debris after a DGE. "Speed Up Your Cleanup" (information on separating debris by type), and "Garbage Collection Delay Fact Sheet" (what to do when waste collection is delayed) are attached and are also available at: www.nj.gov/dep/dshw/debris/cleanup flyer.pdf?2021

MANAGEMENT

DOCUMENTATION AND RECORDKEEPING

During a Federally Declared Disaster or a State, Municipally, or County declared emergency, you should ensure that all debris removal and disposal activities are well documented through load tickets, daily field logs and photos. Maintaining complete records is essential to debris management operations. At a minimum, the following information should be documented: the type of debris collected, the amount of each type of debris collected, the original collection location, and the location of the final disposal or recycling facility, and amount of debris that has been disposed of or recycled.

While not all DGEs will be eligible for reimbursement under FEMA's Public Assistance Program, if a DGE does become eligible, FEMA will require detailed records on all the debris management operations, including the TDMA operations.

Records that need to be maintained for TDMA operations include:

- ✓ Quantity of debris received at the TDMA
- ✓ Quantity of debris processed at and/or removed from the TDMA
- ✓ End market or final destination of the removed debris and DEP approval of the receiving facility, if required
- ✓ Hours employees worked on debris operations vs. normal operations

Failure to properly document eligible work may jeopardize reimbursement under FEMA's Public Assistance Program. Even if a DGE does not become eligible for FEMA reimbursement, complete records are still necessary to comply with DEP reporting requirements.

Federally Declared Disasters for which you may seek reimbursement may require additional documentation and requires that a debris monitor oversee collection, storage, removal, and disposal activity. Force labor, contract labor, and equipment usage also will need to be documented in addition to the requirements above.

Documentation should include, but not be limited to load tickets, photographs, timesheets, daily field logs, and invoices.

FEMA REQUIREMENTS

If the DGE is a Federally Declared Disaster, knowledge of FEMA guidelines is important to maximize potential reimbursement. FEMA's "Public Assistance Program and Policy Guide" is available at www.fema.gov/media-library/assets/documents/111781

DEBRIS MANAGEMENT OPTIONS

When a DGE occurs, there are options available to help you manage the high volume of debris.

▶ BRINGING DEBRIS DIRECTLY TO A FINAL DISPOSAL FACILITY OR RECYCLING CENTER
If you have a disposal facility or recycling center within your municipality, county, or close by,
bringing it to those facilities may be the most efficient and cost-effective way to dispose of the
debris. However, there may be circumstances where you may not be able to get to the facility,

the facility may not be operational, or the facility may be overwhelmed by the volume of debris. You may want to consider applying for a Temporary Debris Management Area (TDMA) Pre-Approval, just in case. (See below)

▶ OPERATING UNDER A RECYCLING EXEMPTION (VEGETATIVE DEBRIS ONLY)

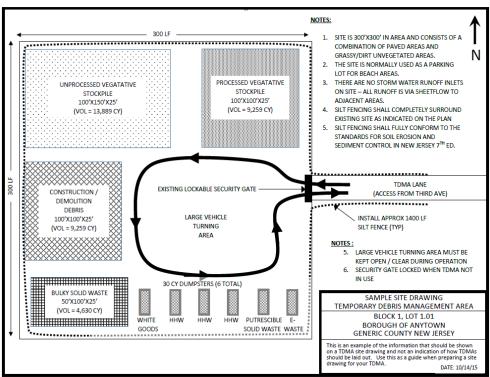
If you need to temporarily store ONLY vegetative debris AND the amount of the vegetative debris will be less than 7,500 cubic yards, you may be eligible for an exemption from the Recycling Rules. Many municipalities already have areas that have been approved for a recycling exemption. If you aren't sure if your municipality has one, just give us a call and we can check for you.

APPLYING FOR A TEMPORARY DEBRIS MANAGEMENT AREA PRE-APPROVAL

A Temporary Debris Management Area (TDMA) is an area where counties or municipalities can temporarily store DGE related debris until it can be transported to a disposal facility or recycling center. Details regarding TDMAs are outlined below.

TEMPORARY DEBRIS MANAGEMENT AREA BASICS

A Temporary Debris Management Area (TDMA) is an area where counties or municipalities can temporarily store DGE related debris until it can be transported to a disposal facility or recycling center.



Example of a typical TDMA

A Temporary Debris Management Area CANNOT be used without first receiving an approval from the Department. Operating a TDMA without approval is a violation of New Jersey's Solid Waste Rules. It may also jeopardize cost reimbursement opportunities from FEMA if you use the TDMA during a Federally Declared Disaster without prior approval from the Department. We strongly encourage you

to submit a TDMA Pre-Approval form before a DGE occurs. Once approved, a TDMA site pre-approval does not expire, unless site conditions change.

PRE-APPROVED TDMAS CAN BE ACTIVATED UNDER THE FOLLOWING SITUATIONS:

- ▶ The Governor declares a State of Emergency (for your county or municipality) AND an Administrative Order is issued by the Department of Environmental Protection. In this situation, simply call and/or e-mail us (solidwasteemergencies@dep.nj.gov) to activate. After notifying the DEP, a response is not required to start using the TDMA.
- ▶ A DGE occurs, but a State of Emergency has NOT been declared, or is no longer in effect. In this situation, Call or e-mail (solidwasteemergencies@dep.nj.gov) to request activation. Your request will be forwarded to Solid Waste Enforcement for evaluation of "enforcement discretion" approval. You must wait for approval from the DEP before using the TDMA.

WHAT TYPES OF DEBRIS CAN BE STORED AT A TDMA?

- ✓ Vegetative Debris: trees, tree limbs, tree trunks, brush
- ✓ Construction and Demolition Debris: plywood, wallboard, concrete, carpets, glass
- ✓ Bulky Solid Waste: couches, furniture, large household items
- ✓ White Goods: refrigerators, freezers, washers, dryers
- ✓ Household Hazardous Waste: oil, paint, lawn chemicals, household cleaners
- ✓ e-Waste: TVs, computers, monitors, laptops
- ✓ Municipal Solid Waste: putrescible and non-putrescible

HOW DO I SUBMIT AN APPLICATION FOR A TDMA PRE-APPROVAL?

It's easy and IT'S FREE! Just complete the four-page fillable PDF form, attach a site drawing and current site pictures, and submit it to the Department via solidwasteemergencies@dep.nj.gov. The application, instructions, and guidance documents can be found at www.nj.gov/dep/dshw/debris/tdmaforminstruct.html.

If you need assistance filling out the form, or have questions about TDMAs, contact us by phone at (609) 633-1418 or by e-mail at solidwasteemergencies@dep.nj.gov.

WHY SHOULD I SUBMIT FOR A TDMA PRE-APPROVAL NOW? CAN'T I WAIT UNTIL A DEBRIS GENERATING EVENT OCCURS?

When a DGE occurs, the Department receives numerous TDMA applications all at once. They are reviewed and processed in the order in which they are received. Each application is reviewed for administrative completeness, and then goes through a technical review to ensure that the TDMA is not located in environmentally sensitive areas. Due to the volume of TDMA applications received immediately after an DGE, the review process may take longer than normal. Since you cannot use the TDMA until it has been approved by the Department, it may result in a delay of debris removal activities for your county or municipality.

DON'T WAIT 'TIL IT'S TOO LATE!

Let us help your County or Municipality plan for the next emergency debris generating event! Utilize our knowledge and resources to get your debris plan completed. DEP's Debris Management Unit staff are available for meetings or for presentations on emergency debris management and Temporary Debris Management Areas.

If you have any questions about the information contained in this toolkit, or about emergency debris management, please contact the Department's Division of Sustainable Waste Management at (609) 633-1418, or by e-mail at solidwasteemergencies@dep.nj.gov

ATTACHMENTS

- USACE HURRICANE DEBRIS ESTIMATING MODEL
- FACT SHEET FOR RESIDENTS AND LOCAL GOVERNMENTS IN THE EVENT OF A DELAY IN REFUSE COLLECTION
- SPEEDUP YOUR CLEANUP FLYER

U.S. Army Corps of Engineers Hurricane Debris Estimating Model

Background

- The U.S. Army Corps of Engineers (USACE) Emergency Management staff has developed a modeling methodology designed to forecast potential amounts of hurricane generated debris.
- Based on actual data from Hurricanes Frederic, Hugo and Andrew.
- The estimated quantities produced by the model have a predicted accuracy of \pm 30%.
- The primary factor used by the model is the number of households in a developed urban/suburban area.
- Other factors utilized are:
 - Cubic yards of debris generated per household per storm category.
 - Vegetative cover.
 - Commercial density.
 - Precipitation.
- Household debris includes damage to the house, contents and surrounding shrubs/trees.
- Vegetative cover includes all trees and shrubbery located along public rights-of-way, parks and residential areas.
- Commercial density includes debris generated by damage to businesses and industrial facilities.
- Private contractors will remove the majority of commercial related debris; however, disposal/reduction space is still required.
- Very wet storms will cause ground saturation, increasing tree fall.

Initial Planning Data

- For planning purposes, the worst case scenario should be used for the subject area.
- The most accurate process is to determine the defined areas by using Doppler Radar (National Weather Service Broadcasts) and Geographical Information Systems (GIS).
- Doppler radar will define the storm's intensity and the exact track of the eye of the storm in relation to the affected area.
- Track the storm and plot the eye path and 5-mile wide bands out from the eye to define areas and estimate wind speeds.
- The wind speed of the eye wall normally determines the reported storm category with the outward or 5-mile bands being a lesser category.
- Track the storm inland until the wind speeds dissipate below hurricane strength.
- Divide outlined areas by storm category.
- Enter coordinates into a GIS database to determine areas and demographic information, such as:
 - Population.
 - Schools.
 - Businesses.

STEP 1—ESTIMATING DEBRIS QUANTITIES

The formula used in this model will generate debris quantity as an absolute value based on a known/estimated population or a debris quantity per square mile based upon population density per square mile.

- Determine population (P) in the affected area.
- For example, 1990 census data for Harrison County, MS, is 165,500.
- P = 165,500.
- The assumption of 3 persons per household (H) is used for this model.

• Known/estimated population (P) for a jurisdiction may be used to determine a value for H or H=P/3.

Example

A category 4 storm passes through Harrison County, MS. The area is primarily single family dwellings with some apartment complexes, schools, and shopping centers. Vegetation characteristic is heavy because of the proliferation of residential landscape shrubbery and trees throughout the area. The storm is very wet, with rain before and continuing for a few days after the hurricane.

Formula: Q = H(C)(V)(B)(S)

H= P/3 = 165,500/3 = 55,167 (3 persons/household)

C= 50 (Factor for a Category 4 storm)

V= 1.5 (Multiplier for heavy vegetation)

B= 1.3 (Multiplier for heavy commercial due to schools/stores/apartments)

S= 1.3 (Multiplier for wet storm event)

Then $Q = 55,167 \times 50 \times 1.5 \times 1.3 \times 1.3 = 6,992,374$ cubic yards of debris or 7 million cy

The Model Formula: Q = H(C)(V)(B)(S) where:

Q is the quantity of debris in cubic yards.

H is the number of households.

C is the storm category factor in cubic yards.

V is the vegetation characteristic multiplier.

B is the commercial/business/industrial use multiplier.

S is the storm precipitation characteristic multiplier.

C is the storm category factor as shown below. It expresses debris quantity in cubic yards (cy) per household by hurricane category and includes the house and its contents, and land foliage.

| HURRICANE | VALUE OF "C" | |
|-----------|--------------|--|
| CATEGORY | FACTOR | |
| | | |
| 1 | 2 cy | |
| 2 | 8 cy | |
| 3 | 26 cy | |
| √4 | √50 cy | |
| 5 | 80 cv | |

V is the vegetation multiplier as shown below. It acts to increase the quantity of debris by adding vegetation, including shrubbery and trees, on public rights-of-way.

| VEGETATIVE COVER | VALUE OF "V" MULTIPLIER | |
|---------------------|----------------------------|--|
| LIGHT | 1.1 | |
| MEDIUM | 1.3 | |
| ✓HEAVY | √1.5 | |

B is the multiplier that takes into account areas that are not solely single-family residential, but includes small retail stores, schools, apartments, shopping centers, and light industrial/manufacturing facilities.

Built into this multiplier is the offsetting commercial insurance requirement for owner/operator salvage operations.

| COMMERCIAL DENSITY | VALUE OF "B" MULTIPLIER | |
|--------------------|----------------------------|--|
| LIGHT | 1.0 | |
| MEDIUM | 1.2 | |
| ✓HEAVY | √13 | |

S is the precipitation multiplier that takes into account either a "wet" or "dry" storm event. A "wet" storm for category 3 or greater storms will generate more vegetative debris due to the uprooting of complete trees.

| PRECIPITATION | VALUE OF "S" |
|------------------|--------------|
| CHARACTERISTIC | MULTIPLIER |
| NONE TO LIGHT | 1.0 |
| ✓MEDIUM TO HEAVY | ✓1.3 |

NOTE: Steps 2 and 3 of this model can also be applied to other debris generating events once an estimated quantity of debris is established.

STEP 2—DEBRIS STORAGE SITE REQUIREMENTS

- Estimate debris pile stack height of 10-feet.
- 60% usage of land area to provide for roads, safety buffers, burn pits and household hazardous waste areas.

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1 acre (ac) = 4,840 square yards (sy)
10 foot stack height = 3.33 yards(y)
total volume per acre = 4,840 sy/ac x 3.33 y = 16,117 cy/ac
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• From the example above, the acreage required for debris reduction sites is:

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7,000,000/ 16,117 cy/ac = 434 acres (required for debris storage only, no buffers, etc.)
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• To provide for roads and buffers, the acreage must be increased by a factor of 1.66.

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434 ac x 1.66 = 720 acres or, since one square mile (sm) = 640 acres 720ac/640as/sm=1.12 sm.
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- If you assume a 100 acre storage site can be cycled every 45 to 60 days or one time during the recovery period, then 720/2 = 360 ac or four 100 acre sites would be required.
- The number of sites varies with:
 - Size.
 - Distance from source.
 - Speed of reduction (mixed debris is slower than clean woody debris).
 - Removal urgency.

• The USACE commonly removes approximately 70% of the total volume generated with local governments, volunteer groups, and private individuals removing the remainder.

If 7 million cy were estimated, the USACE would estimate removing approximately 4.9 million cy of debris.

STEP 3—CATEGORIES OF DEBRIS

Debris removed will consist of two broad categories:

- Clean wood debris.
- Construction and demolition (C&D) debris.
- The clean debris will come early in the removal process as residents and local governments clear yards and rights-of-way.
- The debris removal mission can be facilitated if debris is segregated as much as possible at the origin along the right-of-way, according to type.
- The public should be informed regarding debris segregation as soon as possible after the storm.
- Time periods should be set for removal, the first 7-10 days clean woody debris only, then followed by other debris, with the metals segregated from non-metals.
- Most common hurricane-generated debris will consist of the following:

30% Clean woody debris

70% Mixed C&D

Of the 70% mixed C&D:

42% Burnable but requires sorting 5% Soil 15% Metals 38% Landfilled

• Based upon the above, 7,000,000 cy of debris would break down as follows:

2,100,000 cy Clean woody debris

4,900,000 cy Mixed C&D

- Of the 4,900,000 cy of mixed C&D, 2,058,000 cy is burnable but requires sorting, 245,000 cy is soil, 735,000 cy is metals, and 1,862,000 cy is landfilled.
- Burning will produce about 95% volume reduction.
- Chipping and grinding reduce the debris volume on a 4-to-1 ratio (4 cy is reduced to 1 cy) or by 75%.
- The rate of burning is basically equal to the rate of chipping/grinding, about 200 cy/hr. However, chipping requires on-site storage and disposal of the chips/mulch.

FACT SHEET FOR RESIDENTS AND LOCAL GOVERNMENTS IN THE EVENT OF A DELAY IN REFUSE COLLECTION

Citizens cooperation and common sense in finding and using alternatives will minimize problems which may result from a delay of waste collection services in the event of a natural or man-made disaster or a strike.

The actions listed below were prepared by environmental and health personnel to assist you in easing the effects of a disruption of waste collection at your homes and in your communities.

| 1. | Limit the amount of waste produced: | • | Avoid the use of disposable products such as paper or plastic plates, cups or disposable diapers. |
|----|---|---|---|
| | | • | Reuse products such as plastic containers, jars and aluminum foil. |
| | | • | Compost vegetative and yard wastes if space permits. |
| | | • | Delay any major household cleanups such as backyard cleanup, tree pruning or disposal of old furniture. |
| 2. | Separate and store food wastes and other wet garbage: | • | Drain excess garbage moisture. Pour fats, drippings and grease into glass jars and seal with a screw on lid. |
| | | • | Put food waste, disposable diapers and other wet waste into double plastic bags. |
| | | • | Add a capful of ammonia to reduce odor which will attract animals and other vermin. |
| | | • | Secure trash bag tightly and store in a cool place. |
| 3. | Separate and store recyclable | • | Rinse bottles and plastic containers. |
| | materials: | • | Rinse and crush aluminum and tin cans, trays and containers. |
| | | • | Bundle cardboard, paper, and magazines. |
| | | • | Store recyclable materials indoors, out of reach of children, and away from combustible materials. |
| 4. | Separate dry, non-recyclable waste: | • | Store non-recyclable paper, containers, packaging and other dry waste indoors and away from combustible materials. |
| 5. | Separate hazardous household waste: | • | Separate fluorescent lights, paints and thinners, insecticides and herbicides and store out of reach of children. Hold until county household hazardous waste collection day. |

