

GUIDANCE FOR DETERMINING ACREAGE NEEDED FOR TEMPORARY DEBRIS MANAGEMENT AREAS

The quantity and type of debris that may be generated by an emergency event varies based upon the magnitude and type of the event, which can make planning for the management of that debris difficult. However, the Department is providing the following guidance to assist municipalities when evaluating potential TDMA locations and sizes.

Note: This Guidance is based significantly upon the U.S. Army Corps of Engineers (USACE) “APPENDIX A, USACE HURRICANE DEBRIS ESTIMATING MODEL” available at:

http://dps.sd.gov/emergency_services/emergency_management/images/dmgappa.pdf

Qualifiers: The estimated debris quantities calculated by the model have a predicted accuracy of $\pm 30\%$. The USACE formula was developed for use immediately prior to a hurricane event. For the purpose of pre-planning, the Department recommends assuming the mid-range for the hurricane category (e.g., 26 cubic yards) and medium to heavy for the storm precipitation multiplier (value of 1.3). The assumption of 3 persons per household is used in this guidance. While this guidance is based upon a hurricane as the debris generating event, the result can be used as a guide for other possible debris generating events, such as floods, building collapses, etc.

STEP 1—ESTIMATE QUANTITY OF DEBRIS

Calculate the amount of debris which may be generated by an emergency event based on the number of households and businesses in the community as well as an estimate of vegetative cover. The resulting quantity of debris (Q) will be used in the calculation in Step 2.

Formula:

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

Q is the quantity of debris in cubic yards.

H is the **Population in the jurisdiction divided by 3** to determine the number of households. For example, a municipality with a population of 1200 would have an H of 400.

C is the storm category factor in cubic yards. The Department recommends using 26 cubic yards.

V is the vegetative cover multiplier. The Department recommends using the table below for determining vegetative cover. For our municipality example of 1200 people, $V = 1.1$.

B is the commercial/business/industrial density multiplier. The Department recommends using the table below for determining Business/Commercial density. For our municipality example of 1200 people we estimate a light business/commercial multiplier of 1.0.

S is the storm precipitation characteristic multiplier. The Department recommends using 1.3.

Vegetative Cover Multiplier	
Population Density	Vegetative Multiplier
Urban; > 3500 people per sq. mile	1.1
Suburban; < 3500 and > 2000 people per sq. mile	1.3
Rural; < 2000 people per sq. mile	1.5

Business/Commercial Density Multiplier	
Business/Commercial Use	Business/Commercial Multiplier
Heavy	1.3
Medium	1.2
Light	1.0

For our municipality example of 1200 people, Q = 14,872 cubic yards.

STEP 2—CALCULATE ACREAGE NEEDED FOR A TDMA

Using the debris generation quantity (Q) calculated in Step 1, determine the acreage required for storage at a TDMA. The maximum acreage required for the storage of all debris is determined by dividing the debris generation quantity (Q) by the number of cubic yards of debris which may be stored per acre and using a multiplier to account for the roadways within the site and the buffers around the site. The Department recommends using 16,117 cubic yards per acre and a roadways/buffers multiplier of 1.66 (see Calculation of Qualifiers below for more details).

Due to New Jersey's substantial solid waste infrastructure and our recent experience with Superstorm Sandy, the Department recommends that local officials pre-plan TDMA's that are 10% of the maximum acreage required for the storage of all generated debris. This is based on the assumption that waste stored at a TDMA can be moved out relatively quickly to final disposal destinations.

Formula:

TDMA Acreage = Q divided by 16,117 cy/acre x 1.66 for roads/buffers x 0.10

For our municipality example of 1200 people, TDMA Acreage = 0.153

Calculation of Qualifiers:

Total volume per acre = 4,840 sy/ac x 3.33 y = 16,117 cubic yards per acre

Debris pile stack height of 10 feet = 3.33 yards (y)

1 acre (ac) = 4,840 square yards (sy)

Roadways/buffers multiplier = 1.66
Infrastructure Factor = 10% or 0.10

IMPORTANT NOTES:

The Department urges local jurisdictions that do not have sufficient TDMA capacity due to lack of available space to consider the use of a shared service agreement, authorized pursuant to N.J.S.A. 40A:65-1 et seq. The Agreement must specify services to be provided, including scope of performance, assignment of responsibilities, and procedures for payments. The Department also urges consideration of regional TDMA's. Local officials should coordinate selection of TDMA's with their County Office of Emergency Management and County Solid Waste Planning office.

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