

**ANNEX 2:**  
**Planning for Disaster Waste Management**

## Planning for Disaster Waste Management

For many waste planning authorities, already struggling to cope with rapidly increasing waste volumes linked to their expanding consumer-based social systems, the generation of additional wastes by a disaster can exceed their ability to cope.

Natural disasters, industrial accidents and other emergency situations generate large quantities of waste that are difficult to handle both during and after the crisis. The sheer volumes of waste and the unknown composition of some of it make handling and disposal a potential risk to human health and the environment.

It is probable that the infrastructure and personnel normally dealing with waste management will not be available during a crisis, as all available resources are usually dedicated to addressing humanitarian issues. Waste clearance and disposal is therefore often left to inexperienced personnel under ad-hoc conditions, presenting an immediate risk to operators and a threat of pollution and other problems sometime after the event.

It is highly desirable that waste management planning at local and national levels take into account the high-volume wastes from potential disaster events. However, 'disaster event' is clearly a variable concept, and it is therefore essential that the emergency agencies be involved in defining the types of events that could occur in individual communities, allowing the waste agencies, in turn, to make adequate contingency provisions.

The following issues can be incorporated into the disaster waste management planning process:

1. Identification, with emergency agencies, of possible disaster events that could occur, and development of scenarios on the basis of risk assessments.
2. Estimation of likely volumes and composition of wastes from various disaster scenarios. Attention should be given to waste components with potential health and environmental impacts such as chemical contamination from commercial premises, wastes from health care institutions, asbestos and other substances commonly included in buildings, spilled fuels and oils, and agricultural chemicals from stores and farms. Residues generated by damage to waste disposal facilities themselves, such as floods sweeping away a garbage dump, should also be included.
3. Identification of possible storage or disposal areas for large volumes of inert solid debris close to where such waste might be generated, i.e. towns and industrial zones. It is unlikely that debris will be carried very far during a crisis.
4. Identification of additional removal, transport and handling equipment and of personnel that might be called upon (and not already employed in other aspects of humanitarian crisis relief). The emergency services should have a stand-by list of resources immediately appropriate to waste management functions, and should know the land areas available for storage/disposal.
5. Identification of the possibilities for separation and recovery of potentially valuable waste components. As well as providing secondary materials for reconstruction, such operations provide some employment relief for victims who have lost their livelihood. Ownership, resale or donation conditions of recovered waste should ideally be determined in the planning process, to avoid time-consuming disputes during a crisis.

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6. Training of non-waste personnel to assume temporary waste management functions during a crisis.
  7. Identification of wastes that might arise from a large-scale disaster relief operation, especially health-care wastes and any equipment that will eventually be discarded.
  8. Explicit planning for circumstances in which major industrial accidents cause an especially difficult situation, as regular municipal authorities have little experience in handling the debris from chemical plants or transport accidents. While the industry's expertise can assist, questions of legal liability and lack of facilities that can accommodate such special waste remain.
  9. Integration of the normal waste generated during the emergency period into the waste management plan, as well as additional waste such as medical waste that is produced during relief operations. This has to be managed at the same time as the debris.

In particular, the following need to be incorporated into disaster waste planning:

- maintaining close links with disaster management agencies, and ensuring that waste management is incorporated into emergency plans;
- nominating stand-by waste personnel and equipment and ensuring training and practice, as in normal emergency management;
- identifying temporary waste handling locations;
- resolving legal liability and ownership issues concerning emergency wastes;
- disaster mitigation measures in the design and operation of waste management facilities;
- elaborating special emergency waste systems for sensitive installations like hospitals;
- incorporating disaster wastes into waste planning at national and local level.

A coordinator/manager for disaster waste should be clearly identified by the authorities.

**What is disaster\* waste?**

*\* Earthquakes, floods, tsunamis, landslides, forest fires, hurricanes  
factory explosions, transport accidents, pipeline ruptures, oil spills  
conflicts, civil disturbance,*

Natural and man-made disasters can generate enormous volumes of debris, including soil and sediments, building rubble (brick, concrete and timber), vegetation (leaves, branches and trees), personal effects, hazardous materials (oil drums, asbestos and batteries), mixed domestic and clinical wastes and, all too often, human and animal remains. This waste represents a risk to human health from biological sources (flies, rodents, rotting carcasses), chemical sources (asbestos, oils, solvents) and physical sources (cuts, abrasions, collapse). The waste also impedes pedestrian and vehicle access and blocks services (drains, sewers).

Disaster waste also comprises valuable resource materials including scrap metals (copper, steel, aluminium), timber (for reconstruction and heating/cooking), demolition waste from buildings/structures (for re-use, re-working as an aggregate or in-filling/protection material) and uncontaminated soil/sediment (for restoration or in-filling). Industrial accidents (including transport spills) involve a range of chemicals and fuels that present significant risks to communities, to handlers of the waste, and to the environment when soil and water are contaminated.

Taken together, disaster waste management places an additional burden on a community already struggling to cope during a crisis. Good planning helps to be prepared for events that will generate exceptional wastes.

**Some further Information**

1. WHO, *Safe Management of Wastes from Healthcare Activities*. Chapter 16 refers specifically to emergency situations.
2. State of California, Integrated Waste Management Disaster Plan, <http://www.ciwmb.ca.gov/Disaster/DisasterPlan/>
3. Waste Management in Emergencies network, <http://www.redr.org/WMinE/index.htm>