

Initial Damage and Debris Assessment

Two types of assessments must be initiated at the outset of the emergency: Damage Assessments and Debris Assessments. Simply put, the Damage Assessment will provide an estimation of the range and extent of the damage, and the Debris Assessment will provide an estimation of the volume and type of debris. Both types of assessments will provide you with an immediate idea of the location of “hot-spots” (i.e., areas requiring immediate attention).

Damage Assessments

An initial damage assessment and inspection of infrastructure systems (e.g., local roads, bridges, sewer and water systems) will be conducted by Engineering site personnel and other competent personnel. An initial survey of critical public facilities will be conducted by Building site personnel. Unsubstantiated damage reports will be verified through assessments and inspections on a priority basis. Detailed assessments of the stability of Municipal-owned structures will be performed by Structural Engineers (Municipal Hall).

The purpose of an initial damage assessment is to establish priorities (i.e., essentially to generate a Work Plan). Site personnel will provide damage assessment reports with specific reference to disaster debris, which will include estimates of debris types, quantity and location (and potential impact on critical structures) to the Engineering Branch Coordinator in the EOC. Based on initial damage survey results, the Disaster Debris Response Plan may be activated by the EOC Director or Operations Section Chief (Engineering).

Debris Assessment

The *volume* and *type* of debris must also be assessed at the outset of the emergency, including identifying *critical locations* of debris, such as areas where debris has blocked a Disaster Response Route. SWANA Northern Lights Chapter has developed an electronic tool to assist with initial estimations of debris volume. This tool can be downloaded from www.swananorthernlights.ca

Five Debris Removal Priorities

The priorities for damage assessment and inspections should be the same as the priorities for debris removal. In keeping with established response goals and life safety priorities this Disaster Debris Response Plan has identified 5 priority activities:

1) *Life Safety of First Responders and the Public*

Life safety is the first priority. In the interest of preserving life, the municipality will make every effort to clear the routes required for emergency responders to access critical areas and facilities needed to reduce injury and suffering of the public.

2) *Disaster Response Routes*

If Disaster Response Routes have been identified in the existing civic emergency plan, those routes should be the first priority in the clearing of routes unless otherwise directed by the EOC. Every effort will be made to clear debris from Disaster Response Routes. In the short term, debris will be pushed to the sides of the route to be sorted and transported at a later date.

3) *Debris Damaging to Property and Infrastructure*

Where debris jeopardizes property and infrastructure, every reasonable effort will be made to render it safe.

4) *Damage to the Environment*

Where debris presents a risk to further damage of the environment, every reasonable effort will be made to reduce environmental impact and long-term consequences.

5) *Business Interruption*

Where debris may increase economic or social loss, every reasonable effort will be made to reduce the loss and ensure business continuation.

Operational Disaster Debris Removal Priorities

The EOC is responsible for determining priorities, including disaster debris removal priorities.

The following additional factors will be taken into account when determining priorities:

- Urgency of site clearance (e.g., critical facilities)
- Amount of debris generated
- Type of debris
- Disaster site characteristics
- Debris recycling possibilities
- Geographic complications

Rescue, body recovery, utility, and life-safety issues must be resolved prior to debris assessment and removal.

***it will be helpful to include a list of your community's critical public facilities, as well as a chart on Prioritizing Debris Removal in the Appendices of this plan.**

Four Phases of Disaster Debris Removal

While working within the priority framework, activities within the Debris Removal work plan will fall within these 4 phases:

Debris Removal Phases	Actions to be taken
Phase I: Assessments	Scene assessment concerns need to be stated.
Phase II: Clearance of Routes	Clearing emergency access routes where safe to do so. If not safe to do so, determine alternate routes. Roadway debris is moved to the side of the road to open access routes into devastated areas. No attempt is made to remove or dispose of the debris, only to clear key access routes to allow for the following: <ul style="list-style-type: none"> • Movement of emergency vehicles • Law enforcement • Resumption of critical services, • Damage assessment of critical public facilities and utilities.
Phase III: Removal of Dangerous Debris from Critical Infrastructure	During the emergency opening of key routes, mixed debris is pushed to the shoulders of the roadway, along the public right-of-way. Actions required for removal of debris: <ul style="list-style-type: none"> • develop initial assessment of debris type and magnitude and identify any safety issues • Coordinate, through the EOC, contracted work force to remove debris • Coordinate, through the EOC, with Police to ensure that traffic control measures expedite debris removal activities.
Phase IV: Removal of All Other Debris	Priorities to distribute the available water supply will be a balance between fire fighting demands and health care institutions (e.g. hospitals), as established by the EOC. When an area has been identified as a priority for cleanup, flusher trucks will be assigned to wet debris before removal to minimize dust and reduce dust inhalation.

OPERATIONS & PROCEDURES

Concept of Operations and EOC

The municipal Engineering Operations Department will take a lead role in the activation and coordination of this Disaster Debris Response Plan. The Disaster Debris Response Plan is an Annex of the municipal Emergency Plan. The procedures contained herein should be implemented under the authority of the municipal Emergency Plan. The municipal Emergency Plan should adhere to the relevant Provincial Emergency Planning Act that provides the authority for coordinating emergency response and recovery activities.

The typical model for emergency response in Canada follows four established levels of emergency response activities:

- 1) Site Level (Incident Command Post)
- 2) Site Support Level (Emergency Operations Centre and Department Operations Centre)
- 3) Provincial Regional Coordination Level
- 4) Provincial Central Coordination

Emergency Operations Centre (EOC)

Should an event occur of significant magnitude to require activation of the Emergency Operations Centre, staff with pre-designated response roles will report to the EOC

Department Operations Centre (DOC)

DOCs are typically the facilities or processes used by a municipality for the command and control of day to day business activities. In the early stages of a disaster event, an EOC may not be required or available and the DOC's may be required to fill the primary support role for Site Level activities. If an EOC is required as the event unfolds, a DOC will coordinate directly with the EOC to support the overall objectives set by the EOC Operations Section Chief and the EOC Director.

EOC Reporting Structure

In the interest of maintaining continuity with the EOC,

- Engineering Operations site personnel will coordinate their activities with the Engineering Branch Coordinator in the Operations Section of the Emergency Operations Centre.
- The Engineering Branch Coordinator reports to the Operations Section Chief who in turn reports to the EOC Director.

See Appendix A for a diagram of the EOC and the four levels of activity described above

Ensure your Debris Removal Plan is compatible with the levels of emergency response and recovery that are used in your jurisdiction.

Within the EOC, the two Sections with key responsibility for Disaster Debris are Operations and Planning. Liaison with relevant external agencies takes place

through either the Operations Section or the Liaison Officer in the EOC. The role of Engineering Operations personnel will be to clear access routes and provide for the collection, handling, temporary storage, recycling and disposal of disaster debris collected from public property. In clearing access routes for emergency responders, it may be necessary to push any debris blocking roadways to the side of the roadway to clear the route as a temporary measure.

Engineering Operations, in conjunction with contractors, will also assist residents and businesses with curbside collection of their waste and recyclables once it is properly sorted by the property owners or tenants of the private property. The Information Officer in the municipal EOC will work closely with the EOC Engineering Branch and the Operations Section to provide timely and accurate media releases to enhance public education while informing the public of how disaster generated waste and recyclables should be sorted for pick-up.

This curbside pickup is in addition to normal, daily residential and commercial garbage collection and may involve the use of contractors and other outside agencies. *In order to obtain Provincially-funded Disaster Financial Assistance, ONLY extraordinary costs beyond those normally incurred by the municipality will be funded.* Normal municipal services are not eligible for funding; however, staff overtime costs and contracted services may be eligible for funding. From a financial perspective, it may be better for the municipality to maintain normal garbage collection during normal working hours and to use contractors or staff overtime shifts when working on disaster debris removal.

When disaster debris is collected, it will be disposed of and/or transported to temporary storage sites identified throughout the municipality. When possible, and depending on the conditions of disposal facilities and the markets for recyclable materials, it will subsequently be transported to the appropriate disposal/recycling facility or sold to the market place.

Roles and Responsibilities of Lead & Support Departments

This section identifies the roles and responsibilities of the lead department and any other operating groups in the municipality that have a responsibility to ensure the prompt response to an event involving disaster debris.

LEAD DEPARTMENT: Engineering

- Provide staff to support EOC activation and operations
- Clear roads on a priority basis as established by the EOC (may include temporary road construction, maintenance of disaster response routes, snow and ice control on roads and/or inspection of viable transportation systems)
- Manage traffic through the provision of barricades, signs and other traffic control devices to control traffic and pedestrians
- Arrange for the demolition of unsafe buildings and structures as directed by the EOC

- Maintain regular residential (and some commercial) garbage and recycling collection
- Manage debris including: pickup and disposal of accumulated debris particularly where such debris is on municipal's rights-of-way
- Assist the EOC Logistics function with the supply of municipal equipment and vehicles and/or contact private sector suppliers and contractors who have any necessary specialized resources

SUPPORT DEPARTMENT: Building Department

- Provide staff to support EOC activation and operations
- Conduct building, gas, plumbing and electrical inspections on a priority basis
- Submit damage assessment reports, with cost estimates, to the EOC
- Coordinate demolition of unsafe buildings
- Coordinate disconnection and restoration of essential utility services
- May be required to consider relaxing the permitting and licensing requirements for vehicles for temporary carriers of debris

SUPPORT DEPARTMENT: Planning and Permits

- Provide permits to access buildings
- May be required to provide "on-the-spot" permitting
- May be required to provide waivers for existing facility authorizations which suspend the requirements for licenses or permits under extraordinary circumstances

SUPPORT DEPARTMENT: Parks, Recreation

- Provide assistance through the use of Parks Department outside workers and equipment to the Engineering department for field operations (may include assisting in clearing roads, establishing roadblocks, securing unsafe areas, snow removal, flood control measures and debris removal)
- Assist the EOC Logistics function with the supply of municipal equipment and vehicles and/or contact private sector suppliers and contractors who have any necessary specialized resources

Associated Municipal Activities: Streets

Engineering Operations has responsibility for the protection and replacement of street assets and street furniture.

Parking and Enforcement

Depending on the time of day and day of week, there may be traffic gridlock and the need for removal of vehicles. There will be operable and inoperable vehicles to be designated as such and removed from the routes. The towing operation in cooperation with Parking Bylaw Enforcement will coordinate the removal of vehicles where necessary.

Electrical/Traffic Lights

The Electrical Services utility will take the lead role in minimizing electrical hazards which may result from power poles and street lights collapsing. They will also designate the handling, transportation and storage of debris which is comprised of electrical fixtures, poles, cables, transformers and lights.

Arboriculture

The Parks Department may become involved regarding the street right-of-way where trees may have been so severely damaged by collapsed buildings or structures, that the trees may be declared as debris and require removal. Conversely, trees may have only been partially damaged and the Parks Department may wish to maintain and repair these assets in order to rehabilitate the street environment.

DEBRIS TYPES; DISPOSAL & RECYCLING; SPECIAL WASTES

Debris Types

Following a disaster, a new solid waste stream is generated in addition to the regular municipal solid waste (MSW), and the regular demolition, land clearing, and construction (DLC) waste streams. This new solid waste stream is referred to as disaster debris (DD), and often closely resembles the DLC waste stream. Disaster debris may be generated, or be directly related to, a natural or human-caused catastrophe such as an earthquake, fire, flood, landslide, or explosion.

Appendix B, using an earthquake as an example to facilitate decision making concerning the handling of all post-earthquake solid waste, identifies the decisions needed to be made in the process of classification of DD.

NOTE: The above and the Appendix was extracted from Section 2 of the “Disaster Debris Management Report of the JELC Disaster Debris Subcommittee,” prepared primarily by Margaret Wojtarowicz.

Recycling Preference

To save landfill space and effectively use emergency funds, a comprehensive public information program should be prepared in advance of a debris causing event. The information program should be designed initiated to educate residents to separate their disaster debris at curbside and be ready for immediate use at the appropriate time. Residents could be required to separate debris into a few basic categories such as: wood, metal, brick, drywall, dirt and concrete. Potential markets for this type of waste may make it economical to recycle. This would allow clean materials to then be transported to source separated recycling facilities. The remaining debris would be directed to mixed debris recycling facilities.

A (temporary) recycling coordinator may be appointed during the emergency to manage administrative and field operations. This coordinator could provide oversight to ensure the planned recycling efforts are being implemented.

Assuming that the volume of debris will overwhelm existing municipal collection systems, contractors selected to collect curbside recycling and demolition debris will be given specific instructions by the municipality as per the needs of the disaster.

To obtain the above-mentioned debris management and recycling goal, privately operated facilities should be encouraged to do immediate processing, instead of stockpiling for future recycling use or concentrating on one publicly, or privately-operated processing facility. Appropriate facilities and sites selected should be located in close proximity to the hardest hit areas of the municipality, thereby decreasing the truck round trip travel time.

Temporary Storage or Disposal Sites

Temporary storage sites may be established for operational (i.e., municipal/contractor) use, and also for public use. It is advisable to keep operational and public sites separate.

Temporary storage and recycling sites may include the following:

- Recycling facilities
- Municipal landfill
- Transfer stations
- Vacant municipal lots
- Municipal works yards (Engineering/Parks)
- Parks (developed or undeveloped)
- Parking lots
- Rights-of-way
- Municipal owned property
- Private property
- Tennis courts

Any or all of these potential sites should be selected relative to the needs of the municipality.

Criteria for consideration when selecting temporary site should include:

- Assess in/out
- Security
- Adjacent above-ground structures (i.e. unstable buildings)
- Below ground infrastructure (i.e. are there broken water mains below)
- Proximity to water-ways or other environmental concerns.

Disaster debris (regular/hazardous) may be collected or temporarily stored using any combination of the following:

- Municipal refuse containers
- Municipal roll-off bins
- Private contractor roll-off bins.

Public access containers or roll bins may be assigned to individual garbage collection zones as required.

“Co-Mingled,” “Decomposable” and Landfill Wastes

Debris that has been rapidly scooped off roads may not have been sorted and thus may be mixed, or “co-mingled.” It will still need to be sorted and categorized, either at the storage or disposal site. Debris may also be described as “inert” or “not inert,” meaning that it may rot and therefore must be dealt with as soon as possible.

Note that materials accepted for disposal should be for landfilling purposes only. Loads should be monitored to ensure that materials meet specifications and are not recyclable.

Regular Garbage Collection

After life safety issues have been met, all efforts will be made to resume regular garbage collection. If possible, the Garbage and Recycling Calendar will continue to be used for regular garbage collection. If regular service cannot be resumed due to restricted road access, collection of municipal refuse may be organized at accessible points. Residents can then drop off regular garbage at these sites. Refuse containers will be emptied regularly as required.

Recycling Facilities

Facilities for Recycling Source-Separated Materials

To decrease hauling costs, recycling facilities should be selected and created in close proximity to the hardest-hit areas of the municipality (i.e., where debris has been created). The separated debris placed at curbside by residents and demolition debris should be directed to these facilities.

Facilities for Sorting Mixed Wastes

Potential sites for sorting mixed wastes include:

- Recycling Depots
- Tennis Courts
- Parks
- Undeveloped Park Sites
- Vacant municipal-owned lots
- Privately-owned Recycling Facilities

Note that the adequate separation of hazardous and flammable wastes from other waste types and adjacent structures must be considered when selecting the site(s).

Refer to Appendix C for potential sorting sites.

Special Wastes Mixed in with Disaster Debris

Some waste materials or other matter mixed in with disaster debris may require special treatment in terms of sorting or disposal. Following is a brief description of special wastes and the agency(ies) responsible for dealing with them.

Hospital Wastes

The Health Region having jurisdiction will identify appropriate disposal options for hospital-generated wastes.

Human Remains

The Provincial Coroner's Office is responsible for human remains (whether whole or parts of bodies). The Police Services having jurisdiction is responsible for all missing persons and assists the Coroner's Office. The Coroner's Office has a mass casualty plan.

Note that disaster debris sites containing human remains may require additional security services to prevent concerned family members from trying to access the site. Access to, and management of, human remains in a disaster debris site also requires significantly more careful considerations out of respect to the dead or injured and their families.

Animals and Animal Wastes

Carcasses of small animals, wildlife, etc., will be directed to the SPCA incinerator for disposal in accordance with regulations. Veterinary Officers from Agriculture Canada will stipulate requirements for disposal of large numbers of animal carcasses and farm animal debris.

Hazardous Materials

Hazardous materials such as paint cans, car batteries, oil drums, oil and grease containers, solvents, pesticide containers, acids, asbestos, bio-wastes, and other hazardous materials will be isolated from the debris and stockpiled for subsequent disposal in accordance with regulations.

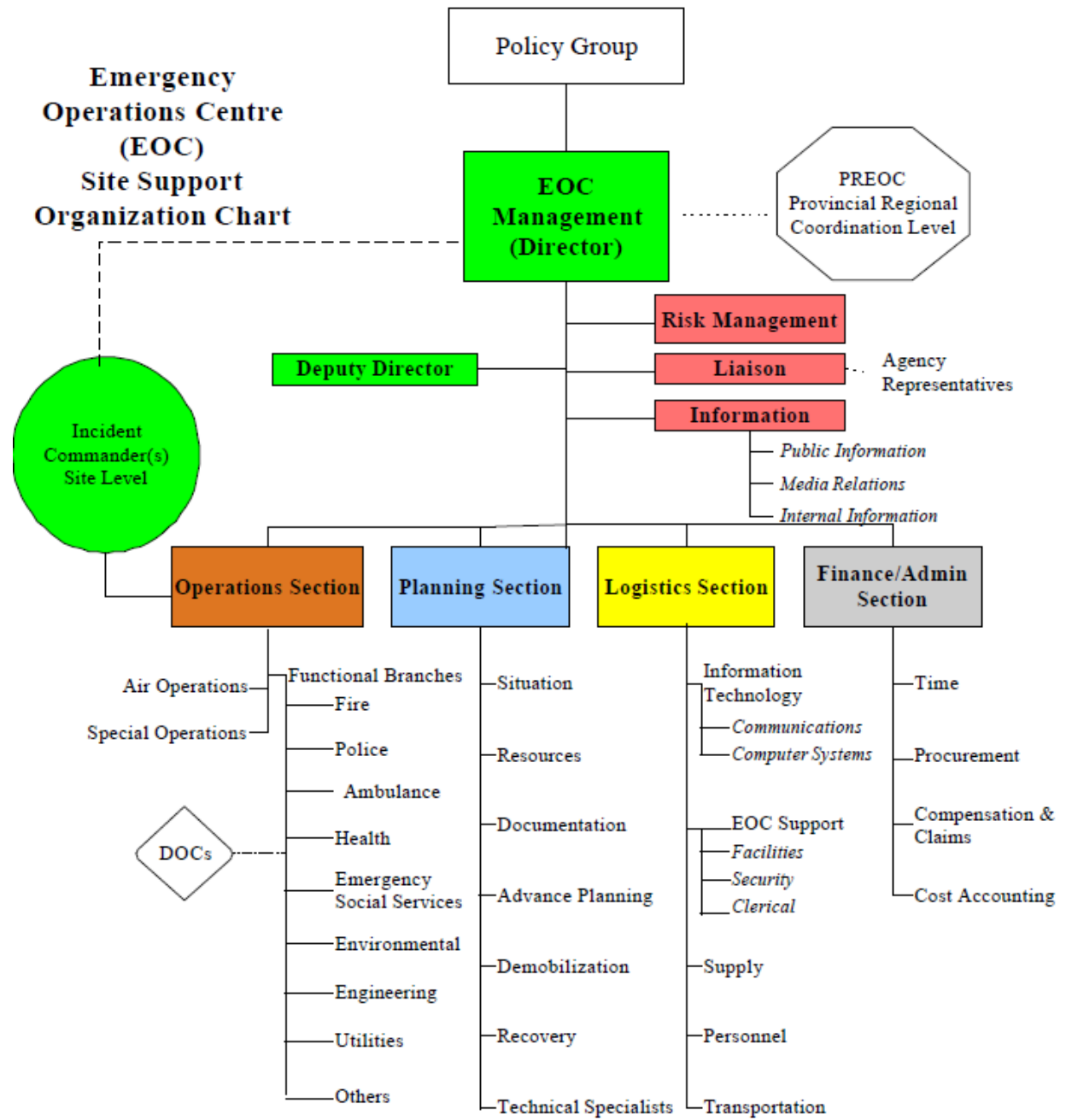
Residual Wastes

Residual wastes as defined in the Waste Management Act should be treated similarly to demolition, land clearing and construction waste (DLC) which is handled at private sector facilities. In the short term, retention at origin will be encouraged.

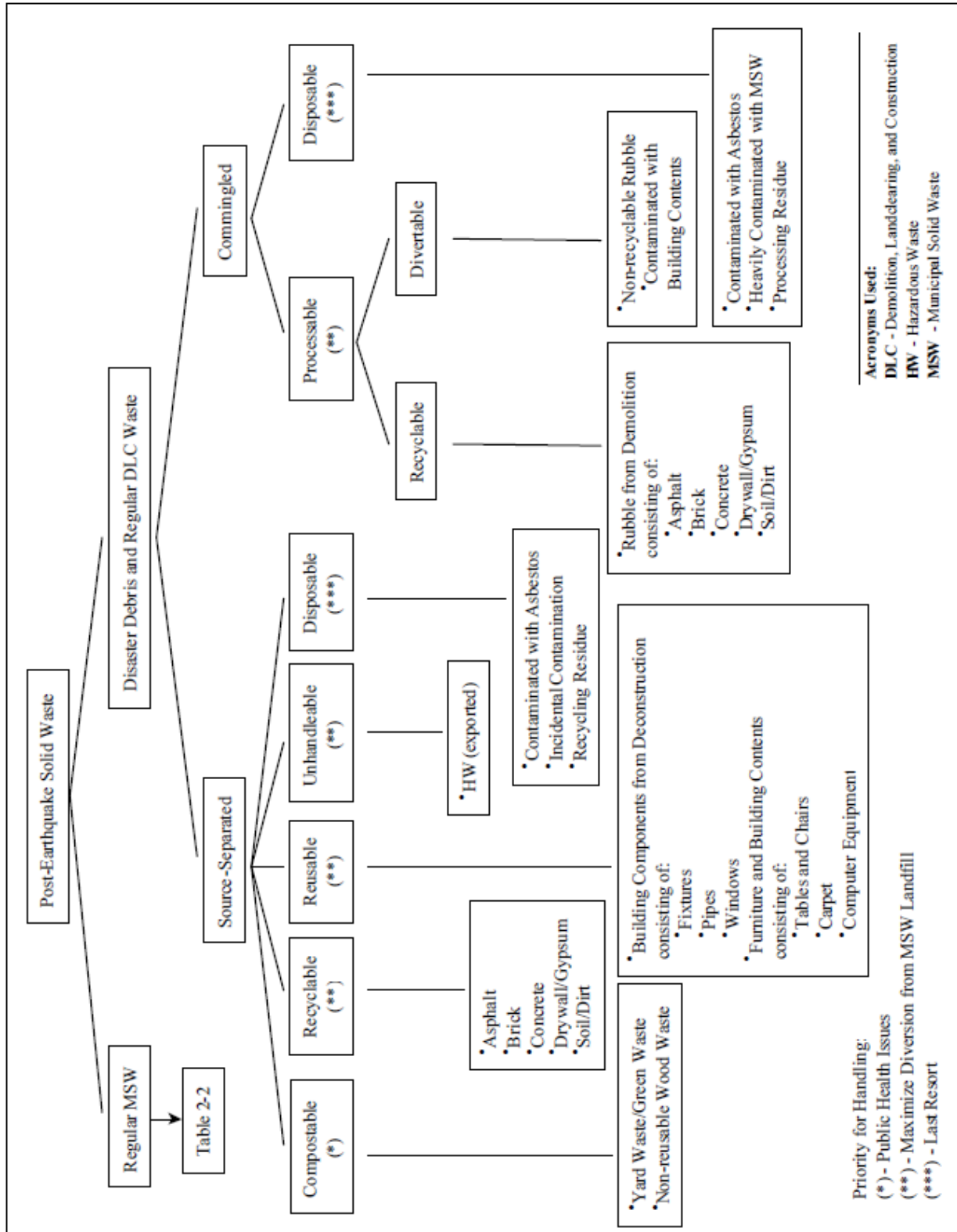
Other Options – Disposal at Sea

In certain extenuating circumstances, disaster debris may be disposed of at sea or in a marine environment. Responsibility for determining the possibility or authority for this option resides with Environment Canada. Concrete is one example of a substance that can be disposed of in the ocean and/or used for rip-rap or dyking. Disposal at sea requires coordination with municipalities to identify locations where barges can dock and load debris for ocean disposal.

Appendix A



Appendix B



Appendix C

Prioritization of Debris Removal

Priority for Debris Removal		
Debris	Priority	Storage Site(s)
Subject to Decay		
Animal corpses		
Food remnants		
Vegetation		
Inert Environmental Debris (dirt, mud, rocks, sand)		
Construction Debris		
Acrylic		
Asphalt		
Blinds		
Brick		
Carpet		
Concrete		
Drywall		
Electrical		
Glass/mirror		
Insulation materials		
Masonry		

Priority for Debris Removal		
Debris Type	Priority	Storage Site(s)
Construction Debris		
Metals		
Tiles		
Pipes		
Plastics		
Rubble		
Vinyl		
Wood		
Appliances/Furniture		
Beds/mattresses		
Upholstered Furniture		

Appendix C (continued)

Priority for Debris Removal Continued...		
Debris Type	Debris Type	Debris Type
Computer equipment		
Telephones, typewriters		
Desks, chairs, chests		
Sofas		
Large Household Appliances		
Personal Items and Objects		
Art work		
Books and papers		
Clothing		
Cooking utensils, china		

Priority for Debris Removal		
Debris Type	Priority	Storage Site(s)
Hazardous Wastes		
Asbestos		
Biomedical Wastes		
Cleaning Agents		
Combustibles		
Explosives		
Fertilizers		
Oils		
Paints		
Pesticides		
Radioactive Substances		
Solvents		
Other Toxic substances		