

Rural/Small Town Organics Management Case Study Disaster Debris Management in Northwood, North Dakota

Background

Northwood is a town in Grand Forks County, North Dakota (population 945). The region is well known for its fertile soil, making it an attractive farming and agricultural business area. On August 26, 2007 a tornado, rated EF4, struck Northwood causing extensive destruction throughout the town and killing one person.



Many of the town's structures collapsed or were severely damaged and eventually torn down because of severe damage from the tornado. About 90 percent of the 362 single-family homes, 80 percent of 110 multi-family homes, all 20 mobile homes were destroyed. About 89 percent of municipal buildings were damaged, fire station and lone school destroyed, power, telephone and cable wiped out. There was widespread damage to downtown business district, including the destruction and closure of the town's only grocery store.

The tornado severely impacted the community in many ways. The waste management challenges required town and state officials to adopt and implement debris management solutions to most cost-effectively remove the debris within the shortest time possible in order to help get the town on the road to recovery.

In recent years North Dakota has had several communities impacted by floods and tornadoes. Following each disaster, the North Dakota Department of Health, Division of Waste Management (Division) worked closely with impacted towns, counties, North Dakota Disaster Emergency Services, the Federal Emergency Management Agency (FEMA), and the U.S. Army Corps of Engineers to ensure that recyclable materials were separated from the debris. From these experiences, the Division adapted and updated a number of guidelines for publication and distribution (see below).

Planning and Program Description

Northwood normally disposed of municipal solid waste at the Grand Forks landfill (about 35 miles from the town). Volume priced garbage collection was introduced in the town to encourage more recycling. The town has an "inert landfill" for drop-off of yard and garden trimmings, trees, branches, wood, building materials, appliances, and furniture.

The capacity of town's small inert landfill was a significant issue in adopting a strategy for handling the debris from the tornado.

Debris management focused on separation:

- Management of asbestos waste
- Processing clean wood and brush for biofuel
- Segregating metal for recycling
- Household hazardous wastes and electronic waste collection
- Segregating and processing concrete and brick

The day after the tornado hit the town, the National Guard was onsite to assist in recovery. Thousands of trees, branches, debris and downed power lines had to be removed from streets to gain access. Residents were then asked to leave separated materials at the curbside for collection. National Guard dump trucks and private haulers collected the curbside materials, along with other debris stockpiled around the town.

The North Dakota National Guard and private haulers collected some 600 loads per day (from 8/27-8/31) of debris. The debris was stockpiled at the Northwood Inert Landfill. Metals (including appliances), brush, concrete and brick were kept in separate piles at the landfill for later processing and recycling as appropriate. Electronics and hazardous materials were collected at another site within the community. Asbestos was managed by a licensed contractor for off-site disposal.



However, to effectively process the brush and to reduce the size of materials to go into the town's inert landfill, the Guard, the Division, the Town, and FEMA all agreed additional equipment was needed. On September 3, 2007, a contractor, Motter's Custom Grinding Inc. , was brought on board to provide and operate a tub grinder to process the debris. Lavern Berger, Berger Enterprises also brought heavy equipment to maintain the solid waste site and coordinate operations.

Tree branches and brush were ground and eventually sold for biomass fuel. The metal and concrete were also salvaged for recycling. Grain from a large elevator was salvaged. A collection site was also established for household hazardous waste and electronics.

Acceptable Materials and Program Participants

Materials were separated into household hazardous waste, electronics, asbestos, scrap metal, wood (tree branches, brush) and concrete/bricks for recycling. The wood was ground for use as biomass fuel. The metal and concrete were recycled. Grain from a large elevator was salvaged. Household hazardous wastes were collected for proper disposal and electronics were stockpiled for recycling.

Cost/Funding

About \$10.1 million to date has been paid for debris removal, emergency protective measures and to repair or replace damaged infrastructure/public buildings. Some additional FEMA funding for Northwood School is pending; cost-shares for the \$10.1 million are: 75 percent FEMA; 10 percent State of North Dakota; 15 percent City of Northwood.

More than 5,400 loads totaling more than 83,000 cubic yards of debris hauled to near-capacity city landfill.

For full details on Northwood's recovery, see: http://www.discovernorthwood.com/tornado_recovery.htm and <http://www.discovernorthwood.com/Anniversary1-YearFactSheet.pdf>.

Outreach and Education

Based upon the experiences of Northwood and other communities hit by disasters in North Dakota, the State Department of Health, Division of Waste Management adapted and updated a number of guidelines for publication and distribution to assist communities in the disaster recovery process.

- [Emergency Response Contractors](#)
- [Debris Removal Guidelines \(for Households\)](#)
- [Disaster Debris and Demolition Waste Separation](#)
- [Guideline 1 Emergency Waste Management And Disposal](#)
- [Wood Processing Recycling Facilities And Equipment Vendors](#)

Equipment and Collection

Dump trucks and other large vehicles, including grapple trucks were used for removing debris from around the town.

A tub grinder was brought in by a contracted service provider to grind brush and other materials. Large excavators, dozers and loaders were needed to manage the sorted debris at the solid waste site.



Results & Impacts

- 600 loads per day (from 8/27-8/31) of debris were collected following the tornado.
- Further cleanup, demolition and renovation went on for over a year. More than 5,400 loads totaling more than 83,000 cubic yards of debris was hauled to the near-capacity solid waste site.
- The North Dakota Department of Health, Division of Waste Management in conjunction with the North Dakota Solid Waste and Recycling Association and the North Dakota Department of Emergency Services continues an outreach program for rural counties and communities to plan for debris management. Many communities do not have the infrastructure, staff or equipment to deal with a natural disaster or other debris issues.

Lessons Learned

- Integrated Waste Management is the key for controlling costs.
 - Trees and wood debris can be ground for mulch.
 - Metal can be segregated for recycling.
 - Concrete and bricks can be stockpiled for crushing.
- Food waste is a big issue and must be removed before processing appliances.
- There needs to be an emphasis on separating household hazardous wastes and electronics.
- Oil Spills and clean-up was an issue that needed special attention.



- Debris Management is an important issue for political “subdivisions”—town, county, state, federal; staff; and, emergency managers. Local leaders are encouraged to prepare a Debris Management Plan which should include:
 - Availability of Contractors
 - Availability of Equipment
 - Response Procedures
 - Availability of adequate facilities

Conclusion

The disaster debris management experiences of Northwood and the state of North Dakota are indicative of the need for municipalities, county and regional governments, and states to work together following a disaster. Few rural communities have a disaster debris management plan in place or the resources to recover from a disaster without outside intervention. The State Department of Health, Division of Waste Management development of publications to assist communities in the disaster recovery process will serve to aide other communities hit by disaster.

Appreciation goes to Steve Tillotson, Assistant Director for the Division of Waste Management, North Dakota Department of Health

For more information, contact the North Dakota Division of Waste Management at 701-328-5163 or stillots@nd.gov visit their website at: www.ndhealth.gov/wm/.

The Northeast Recycling Council (NERC) is a non-profit organization that conducts research, hands-on projects, training, and outreach on issues associated with source reduction, recycling, composting, environmentally preferable purchasing, and decreasing the toxicity of the solid waste stream.

This material is based upon work supported under a grant by the Utilities Programs, United States Department of Agriculture. Any opinions, findings, and conclusions or recommendations expressed in this material are solely the responsibility of the author and does not necessarily represent the official view of the Utilities Programs.