

7. GENERATION OF SOLID WASTE AND RECYCLABLES.

DEFINITION OF SOLID WASTE

Solid waste, as defined in RCRA, is any garbage, refuse, sludge, or other discarded material resulting from industrial, commercial, institutional, and residential activity. Discarded materials include those that are disposed of, abandoned, recycled, or are inherently waste-like. Hazardous wastes are solid wastes that meet specific RCRA or state criteria involving hazardous characteristics or the presence of listed constituents. For the purposes of this ISWMP, hazardous wastes are not included. Hazardous wastes generated at the installation are addressed in the Hazardous Waste Management Plan.

WASTE CHARACTERIZATION

The basis for all solid waste management decision-making is a characterization of the wastes generated. The characterization involves identifying each element of the waste stream, identifying the primary sources of each element, and measuring the amounts generated for each. This may be accomplished through in-house recordkeeping, a contractor survey, or by Army support agencies. Resources used to gather this data include generator interviews, solid waste removal/disposal contracts, waste hauler records, disposal facility records, turn-in documents, records from the environmental office and DRMO, and interviews with key personnel. A waste characterization study may or may not have been performed at the installation, and may be beyond the scope of developing the ISWMP. Ideally, waste characterization data will be available to facilitate more meaningful planning.

a. Waste Characterization. The ISWMP should include characterization information for the following categories of solid waste.

(1) Residential Waste. Indicate the number of households or buildings serviced. Estimate the amounts of refuse disposed from on-post residents and the amounts of each material recycled.

(2) Commercial and Institutional Waste. List the major generators of commercial and institutional waste and identify the recyclable materials. Estimate the amounts of refuse and recyclable materials generated.

(3) Industrial (Non-hazardous) Waste. List the types and quantities, locations generated, and special handling/disposal requirements.

RESIDENTIAL WASTE

Residential waste typically includes wastes from single and multi-family dwellings, BOQ's, and troop housing. This waste may be the most easily characterized and measured, and usually consists of paper, glass, metal, plastics, food wastes, bulky items, furniture, and yard waste. In most cases, recyclable materials are segregated from other wastes for separate collection.

COMMERCIAL AND INSTITUTIONAL WASTE

In some cases, this type of waste is removed by a solid waste contractor and disposed of in an off-post landfill. Waste hauler records or landfill logs should provide estimates, although these may not be accurate. The best way to characterize and measure these wastes is to perform a generator survey. These include administrative offices, commissaries, food service operations, medical facilities (not including regulated medical wastes), warehouses, post exchanges, schools, and laboratories. Typical wastes include paper, food wastes, cardboard, clothing and textiles, furniture, and packing materials.

INDUSTRIAL WASTE

The best way to characterize and measure these wastes is to perform a generator survey. These may include materials discarded from industrial operations and manufacturing processes, such as scrap metals, non-hazardous solvents, greases and oils. Examples of activities that are sources of industrial waste are: motor pools, paint shops, service stations, maintenance shops, craft shops, and auto craft shops.

(4) Construction/Demolition (C&D) Waste. Include a C&D Waste Management Plan as a separate document, or as part of the ISWMP. The generation of C&D waste will greatly affect the installation's overall generation rate and hamper the attainment of the solid waste MoM. The C&D plan should therefore maximize the diversion of these wastes from the solid waste stream. The plan should define policies and procedures for segregating all usable elements of the C&D waste stream for reuse, resale, recycling, or donation prior to consideration of the disposal option. Army policy (currently in draft) will require C&D Waste Management Plans to have the following elements:

- (a) C&D waste management program goals.
- (a) Anticipated installation and contractor benefits.
- (c) Waste management resources, to include listings of local and regional haulers, recyclers, salvage, and other outlets for C&D waste materials.

DEMOLITION OR DECONSTRUCTION?

Army policy calls for minimizing the amount of disposal of solid wastes in landfills or incinerators, and promoting the use of environmentally preferable construction materials including those with recovered content. The selective method of disassembling buildings to preserve and separate potentially recyclable materials is called deconstruction.

Since most major construction/demolition projects are performed by contractors, the best way to obtain information on the associated waste streams is by reviewing the contracts or contacting the COR. Typical wastes include lumber, timber, reinforcing steel, pipes, wires, concrete, brick, plaster, metal, wall board, roofing, insulation materials, and asphalt. Every effort should be made to salvage materials for sale/reuse or recycle them in lieu of landfilling or incineration.

- (d) Requirements for contractor C&D waste management plans.
- (e) Available alternatives to landfilling and/or incineration of waste.
- (f) Contractor incentives to promote waste reduction.
- (g) Procedures for completing economic assessments of alternatives to landfilling and/or incineration of C&D waste.
- (h) Methods for reducing the amount of C&D packaging and packing waste on projects.
- (i) Methods for reducing waste in off-site fabrication and material handling facilities.
- (j) Procedures for collecting and depositing waste on project sites, to include designated locations for waste receptacles, sorting or separating methods, handling and transporting of wastes, special handling requirements such as permits, and schedules for waste pickup.

(5) Yard Waste. Estimate the quantity of yard wastes generated by grounds keeping activities and residential yard maintenance.

YARD WASTE

Data on yard waste generation rates may be available at the installation compost facility if one exists. If yard wastes are composted in a municipal compost facility, the data may be available at that facility or the data may be maintained by the DPW grounds keeping activity. If yard wastes are not segregated from the waste stream, it is difficult to estimate generation rates. Yard wastes typically include grass, weeds, and trimmings from trees and shrubbery.

(6) Other Special Wastes. Indicate the types and quantities of non-hazardous, special wastes generated (wastes that are not disposed as refuse and are not handled through the recycling program).

ADDITIONAL INFORMATION - SPECIAL WASTES

Commercial and industrial activities on the installation can result in the generation of certain non-hazardous solid waste that cannot be disposed of as general refuse. Information on management of these wastes can be obtained from either the solid waste program manager or the hazardous waste program manager. Some examples of special wastes are: waste oil, absorbents with petroleum products, tires, ash, photographic chemicals, scrap metal, adhesives, non-RCRA cleansers, latex paint, water treatment/wastewater treatment sludges, dead animals, pallets, batteries, antifreeze, asbestos, kitchen grease, pesticide containers, pollution control residuals, and septic tank

b. Waste Generation Rates. Although comprehensive waste characterization may be beyond the scope of developing the ISWMP, it is important to have some estimate of waste quantities. The ISWMP should estimate generation rates in units of weight (pounds or tons) rather than volume (cubic yards), since it is an Army policy to collect standardized data by weight.

ESTIMATING WASTE GENERATION RATES

There are several methods of measuring and recording the amounts of solid waste generated.

- One method of measuring overall solid waste generation (excluding recyclables) is weighing refuse collection vehicles as they enter and leave the installation. Unfortunately, most installations do not have truck scales. Collection vehicles are typically weighed at disposal sites; however, a given load may include wastes from sources other than the installation. Therefore, waste hauler records may not accurately reflect an installation's generation rate.

- Systematic waste surveys over a period of time are another way to characterize and measure a particular waste stream. Factors that must be considered in the study are seasonal and climatic variations, large influx or exodus of families and soldiers, and changes in recycling efforts.

- Many installations measure solid wastes by converting container volumes to weights. While this may be one of the easiest methods, drawbacks include the inability to accurately estimate the container fullness and the fact that different waste types have different volume/weight ratios. These factors, if not taken into consideration, reduce the accuracy of using this conversion process to obtain the data.

- Another way to estimate quantities of specific wastes is to compare to typical municipal waste stream breakdowns. This method can only be used for a few waste categories, and may not accurately address the unique wastes generated on Army installations.