

Guideline for the Management of Waste Antifreeze

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1 Introduction

This guideline provides general information on proper management of waste antifreeze. Waste antifreeze is a contaminant under the *Environmental Protection Act* (EPA) of the NWT and must be managed as a hazardous waste.

Ethylene glycol and propylene glycol antifreeze are used to lower the freezing point of water. Ethylene glycol is used in the automotive sector. Propylene glycol is generally used in building heating systems. Both types of antifreeze have anti-foaming agents and corrosion inhibitors that are added to prevent the corrosion of metal.

This guideline is specific to the management of waste antifreeze and should be read in conjunction with the Guideline for the General Management of Hazardous Waste In The NWT (referred to as the General Guideline). Section 2.2 of the EPA gives the Minister of Resources, Wildlife and Economic Development the authority to develop, coordinate and administer these guidelines.

1.1 Definitions

<i>Antifreeze</i>	A chemical additive that lowers the freezing point of water in cooling or heating systems. For the purpose of this guideline, antifreeze used in fuel systems is not included.
<i>Generator</i>	The owner or person in charge, management or control of a hazardous waste at the time it was generated, or a facility that generates hazardous waste.
<i>Transport authority</i>	The regulations controlling the management of hazardous waste under that mode of transport. These include: Road and rail - <i>Transportation of Dangerous Goods Act (TDGA) and Regulations (TDGR)</i> Air - <i>International Civil Aviation Organization Technical Instructions (ICAO)</i> Marine - <i>International Maritime Dangerous Goods Code (IMDG)</i> .
Waste antifreeze	Antifreeze that is no longer useable for its intended purpose due to the build up of impurities or loss of original properties and is intended for storage, recycling or disposal.

1.2 Characteristics

Ethylene and propylene glycol are toxic by ingestion. Many of the corrosion and antifoaming inhibitors added to antifreeze are also toxic. In addition the coolant picks up wear metals from the engine and pipes (such as lead, phosphorous and cadmium) which are also toxic.

Mishandling and mismanagement of these wastes represent a hazard to people and the environment.

1.3 Potential Effects

Ethylene glycol is in widespread use in the automotive industry. As a toxic product, it must be handled with care to prevent accidental poisonings. The lethal dose is 100 milliliters for adults and even less for children. It is mildly toxic by skin contact and has a "sweet" taste that children and animals may find appealing. Improper storage of antifreeze has resulted in fatal poisonings.

Propylene glycol is also toxic and combustible and can react with other chemicals. It requires proper storage and handling. Eye contact should be avoided by wearing proper eye protection whenever it is handled.

Both ethylene and propylene glycol are water soluble. Improper disposal results in the contamination of drinking water, groundwater and land surfaces. Fish, aquatic animals and people can be poisoned.

If antifreeze is poured into a sewage lagoon in sufficient concentrations it may poison the bacteria responsible for sewage treatment. Improperly disposed antifreeze can result in the melting of permafrost which could affect building foundations. Proper care should be taken with all types of antifreeze.

2 Roles and Responsibilities

2.1 Environmental Protection Service

The Environmental Protection Service (EPS) of the Department of Resources, Wildlife and Economic Development is the Government of the Northwest Territories' (GNWT) agency responsible for initiatives which control the discharge of contaminants and their impact on the environment. EPS is responsible for ensuring that environmentally acceptable management procedures, emission levels and disposal methods are maintained. EPS programs are applied primarily to Commissioner's Land, lands administered by municipal governments or GNWT undertakings. Legislative authority is provided by the EPA and *Pesticide Act*. Contact EPS for a listing of relevant regulations and guidelines.

2.2 Generators of Waste Antifreeze

The responsibility for proper waste management rests with the generator and should be considered as part of the cost of doing business.

Every person who generates waste antifreeze is responsible for the proper management of these substances. Waste antifreeze must be safely handled, packaged, stored, transported, treated and/or disposed in accordance with this guideline.

3 Waste Management

Minimizing or avoiding the creation of pollutants and wastes can be more effective in protecting the environment than treating them, or cleaning them up after they have been created.

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3.1 Pollution Prevention

Pollution prevention methods reduce or eliminate the creation of waste. Pollution control options treat waste after it has been generated. Pollution prevention opportunities for antifreeze include the following:

Reduce

- ? Purchase only required amounts of antifreeze.
- ? Establish maintenance schedules that are consistent with the equipment manufacturers suggested replacement.
- ? Select antifreeze products that provide maximum life.

Reuse

- ? Collect antifreeze and return it to the cooling/heat system following maintenance or repair.
- ? Filtering and the use of additives to replenish lost antifreeze properties can extend its useful life.

Recycle

- ? Commercial companies recycle glycol on a fee for service basis. The major automobile manufacturers approve of recycled antifreeze for warranty purposes. Glycol recyclers are available by contacting the waste management associations listed in Appendix II of the General Guideline.
- ? Purchase glycol distillation or reprocessing equipment to return antifreeze back to its original specifications. Suppliers of glycol distillation equipment are available by contacting the waste management associations listed in Appendix II of the General Guideline.
- ? Make an agreement with your supplier/distributor of antifreeze to return the waste antifreeze.

3.2 Storage

Store waste antifreeze according to the following:

- ? Use original containers, where possible, containers manufactured for the purpose or bulked into good quality 16 gauge or lower steel or plastic 205 Litre drums.
- ? Use containers that are sound, sealable and not damaged or leaking.
- ? Containers should be clearly labeled according to the requirements of the Work Site Hazardous Materials Information System (WHMIS) of the *Safety Act* or the relevant

- Transport Authority, if transport to a recycling or disposal facility is planned.
- ? Keep storage containers sealed or closed at all times.
 - ? Protect storage containers from the weather and physical damage.
 - ? Storage should be in a secure area with controlled access.
 - ? Train personnel in the safe use, storage and shipping procedures for waste antifreeze. Only trained persons should have access to the storage area.

Wastes should be stored in such a manner as to prevent spills from entering sewer systems or the environment. Waste antifreeze should **NEVER** be stored with food or in used food containers such as bottles or cans, as it is toxic if ingested.

The short term storage of waste antifreeze is only acceptable as an interim measure to permit time for the collection of sufficient volumes for cost effective transport to a recycling or disposal facility.

Storage of glycol in quantities greater than 1000 litres for a period greater than 180 days requires the site to be registered as a hazardous waste storage facility. Consult the General Guideline or contact EPS for application procedures.

3.3 Transportation

The transport of waste antifreeze requires proper classification, packaging, labeling and manifesting as required by the transport authority (air, marine, rail, road). Specific requirements for waste generators and carriers are detailed in the General Guideline.

Generator numbers, waste manifests and registered hazardous waste carrier lists are available from the Environmental Protection Service. Contacts for recycling or disposal companies are available by contacting the waste management associations listed in Appendix II of the General Guideline.

For road transportation purposes, waste antifreeze can be classified in the following way, depending on the type of antifreeze.

Shipping Name: **Waste Poisonous Liquids, N.O.S.**
Subsidiary Name: Ethylene glycol mixture, or Propylene glycol mixture
P.I.N.: UN2810
Classification: 6.1, 9.2
Packing Group II, III
Special Provisions 102, 109

Further consultation with the transport authority is recommended.

3.4 Disposal

The preferred method for disposal of bulk waste antifreeze is shipping to a registered recycling or disposal facility. Containers that are suitable for transporting waste antifreeze include 205 litre steel and plastic drums that are in good condition. Contacts for these recycling or disposal companies are available by contacting the waste management associations listed in Appendix II

of the General Guideline.

Do not landfill antifreeze, especially in landfills which employ permafrost as a protective barrier. Do **NOT** dump waste antifreeze down the sewer or drain because it can destroy the bacteria responsible for sewage treatment and contaminate ground and surface waters.

Household quantities of waste antifreeze may be accepted at "Household Hazardous Waste Days" locations operated by the municipality.

Disposal of glycols in an industrial incinerator, with supplied air, adequate temperatures and retention time, may be approved by EPS if the costs and distances to a recycler are prohibitive.

Consideration will be given to proposals for alternate management methods that provide a level of environmental protection equivalent to complying with this guideline. EPS may approve the method, subject to conditions.

4 Conclusion

This guideline presents a brief introduction into the management of waste antifreeze. It is intended as a source of basic information and should be read in conjunction with the Guideline for the General Management of Hazardous Waste in the Northwest Territories.

For more information contact:

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