

Plan for Statewide Collection of Household Hazardous Waste

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1. Introduction

Household hazardous wastes (HHW) are wastes that if generated by businesses are regulated as hazardous wastes under Chapter 850, the Maine Hazardous Waste Rules, but that are exempt from Chapter 850 requirements solely because they are generated by households. These wastes have the potential to harm human health or the environment if not handled and disposed of properly.

When disposed of with other household wastes, HHW can release contaminants such as mercury and volatile organic compounds to the environment. This release can be prevented and some materials recycled if HHW is separated from municipal solid waste (MSW) prior to disposal. The purpose of this plan is to discuss options for collection and management of these different HHWs and to provide a roadmap for developing a consistent system that is accessible throughout Maine for collection and recycling of these wastes.

DEP and SPO requested representatives from the private and public sectors to participate in a HHW Management Plan Advisory Committee to advise us in the development of a statewide HHW management system. This committee met three times throughout the summer of 2000 to share their knowledge and experiences in handling HHW. A membership listing of the group is included as Appendix A.

The Advisory Committee coalesced around several desired outcomes, including that the plan:

- have the support of the committee, and therefore the committee must be willing to advocate on its behalf to the legislature.
- propose a realistic and sustainable funding mechanism to maintain the program beyond bond funding.
- create a workable partnership among all the stakeholders including groups not at the table, such as the Publicly Owned Treatment Works (POTW).
- promote participation by the general population by developing and distributing consistent and accessible information on HHW.
- emphasize reduction of the toxicity and use of hazardous household products, and promote the use of “clean” products.
- create a permanent, regular means for communities to manage and reduce HHW that is cost effective and efficient.
- incorporate existing municipal and regional programs.
- be convenient, affordable, accessible to all the citizens of the state.

This report includes:

- Recommendations for supporting and expanding existing HHW and problematic waste collection programs to create a management system that will capture all types of HHW and problematic wastes and be accessible statewide;
- An action plan for establishing the recommended HHW collection system. This action plan includes education and outreach activities necessary to support the development of such a system.
- A discussion, including advantages and disadvantages, of the different types of collection systems;
- Management options for the different types of household hazardous wastes and problematic wastes and priorities for capturing these wastes; and
- Some cost information and funding options for HHW collection.

2. Current HHW Collection Programs in Maine and Proposed Statewide Management System

In Maine some household hazardous wastes and problematic wastes are managed separately from the bulk of municipal solid waste. Table 1 of this report includes a listing of the most common household hazardous wastes as well as some problematic wastes that may be hazardous or cause other safety concerns if not handled properly (e.g., old latex paints and propane tanks). Collection systems that currently exist in Maine to handle these wastes include:

- Extended product stewardship programs in Maine currently handle mercury thermostats and NiCad, lithium, nickel metal hydride, and small sealed lead acid batteries.
- Private third party facilities handle propane tanks, waste oil, antifreeze, and button batteries.
- Transfer stations and recycling centers may currently handle waste oil, propane tanks, and latex paints. As of February 2001 they may also handle universal wastes (lamps, CRTs, mercury thermostats, button batteries and intact PCB ballasts).
- Sporadic, local collection days may be held by municipalities to handle household cleaners, pesticides, acids and bases, pharmaceuticals, personal care products, pool chemicals and flammables. Except for the flammables, all are probably now going to the transfer station or disposal facility, mixed in with other household wastes.

- #3PVC and electronics are wastes of concern that are currently not being handled separately from normal municipal solid waste.
- Some UWs have been handled in pilot projects, such as the lamp collections organized by the Androscoggin Valley Council of Governments.

Changes and additions are needed to transform the current system into a statewide collection system for all household hazardous wastes. These changes include:

- ✓ Implementing a statewide educational campaign to reduce generation and promote proper handling of HHW, Universal Wastes (UW), waste oil, propane tanks, and other targeted solid wastes. (FY 2001/2002)
- ✓ Creating the infrastructure necessary to handle waste paint, universal wastes, mercury added products, and cathode ray tubes (CRTs) at transfer stations. (FY 2001/2002)
- ✓ Developing and funding a statewide thermometer exchange program. (FY 2001/2002)
- ✓ Establishing permanent funding mechanisms for HHW facility operational costs. (FY 2002)
- ✓ Strengthening and expanding the Extended Product Responsibility programs (EPR). (Ongoing)
- ✓ Performing a rigorous cost comparison of different collection models for HHW that is either highly toxic or flammable. (FY 2001)
- ✓ Design a collection system for extremely toxic or flammable HHW based on the cost analysis and other relevant information. (FY 2002)

Along with listing the household wastes of concern, Table 1 identifies the preferred management method for each waste as well as which of these wastes can be handled as part of a Universal Waste collection system. Because the preferred management methods are always source reduction first and EPR wherever possible, neither of these preferred methods is included in the table.

Table 1
**PREFERRED MANAGEMENT OPTIONS FOR
HOUSEHOLD HAZARDOUS and PROBLEMATIC WASTES**

Waste stream	UW?	Door to Door	Periodic collection	Permanent Facility: Recycle/ reuse	Permanent Facility: Fuel Blend/ Disposal	Comments
Paints: oil				A	B	
Paints: latex				A		Non-hazardous
Paint thinner/etc.		A		B	C	
Mercury lamps	Yes			A		
Mercury switches	P*			A		Source reduction
Mercury thermometers	P		A	B		Source reduction
Mercury thermostats	Yes		B	A		Source reduction
#3PVC				A		
CRTs	Yes			A		
CPUs	P			A		
Other electronics	P			A		
PCB lamp ballasts	Yes			A		
Waste oil				A		MORP
Pesticides		A	B			
Propane tanks				A		
Acids/bases		A		B	C	
Pool chemicals			B		A	
Solvents		A		B	C	
Explosives						Notify Police
Antifreeze				A	B	
Flammables/ gas		A			B	
Cleaning/maintenance products				A	B	Source reduction
Personal care products					A	
Pharmaceuticals					A	
Batteries/ alkaline					A	Non-hazardous
Batteries/ ni cad etc.	Yes			A		RBRC
Batteries/ button	Yes			A		
Batteries/ lead acid (not car)	Yes			A		

*P=to be proposed

3. Action Plan to Develop the Statewide HHW Management System

A. Establishing the Infrastructure to Manage Universal Wastes and Mercury-Added Products

To support the establishment of a statewide system that includes both on-going and periodic collection as well as facilitating EPR, the DEP and SPO propose a phased work plan. The first phase entails setting up an infrastructure system for Universal Wastes and mercury-added products during the remainder of FY 2001 and into FY 2002. To accomplish this, the DEP and SPO will take action on a variety of fronts.

Overview of proposed collection system for universal wastes and mercury added products: “An Act to Reduce the Release of Mercury into the Environment from Consumer Products” (effective 8/11/00) directed DEP and SPO to assist interested municipalities and regional associations in developing collection programs for mercury-added products. SPO was appropriated some funds to support the development of this collection infrastructure. Studies of existing collections across the country, whether one day or at permanent facilities, show that participation rates drop dramatically if people have to drive more than 30 minutes. Because of Maine’s size and sparse population in some regions, DEP and SPO have determined it would be optimal to establish a system that includes sheds to collect UW, including mercury lamps, in 23 regions. It is hoped that communities will band together and apply for a State grant to build storage sheds. Applications for the State funds available through SPO will be judged based on the following criteria.

- Solid waste facilities within the host community must be in compliance with existing Solid Waste Rules and have an acceptable compliance history.
- Facility operators and managers must participate in DEP training on collection and handling of UW and mercury added products.
- Proposed sites should be located at or adjacent to an existing public or commercial solid waste facility, recycling center, or other public entity, such as a public works garage, waste treatment plant or water district.
- Facilities should be located within a 45 minute drive of most users.
- Facilities should be regional, with at least 3 towns involved.
- Preference for infrastructure funding should be given to larger population areas.

To encourage municipalities and regional associations to become part of the storage shed program, SPO and DEP will take the following actions:

February - July, 2001: In February, SPO will mail letters introducing the program to every town and commercial solid waste facility. DEP will identify the storage building requirements, develop a brochure for the general public about mercury, and develop a guidance document for recycling and solid waste facilities on the handling and recycling of UW and mercury added products.

Based on the response, SPO and DEP will make site visits to further explain the program and to look at the proposed site. At the meeting expected needs for building size and expected volume of wastes will be discussed.

Applications for the sheds will be due to the SPO by April; SPO will then award the building grants. If desired by the majority of towns, SPO will issue an RFP for the sheds to be built and delivered to the site. (The other option is that towns might build their own sheds to State specifications and bill the State.) SPO will also issue an RFP to contract for pick up of UW and mercury wastes from the collection facilities. Concurrently DEP will develop the training package.

SPO's goal is to begin setting up sheds on site in early summer. DEP will conduct training around the State as needed.

Along with the sheds, the State program will provide signage, storage containers such as the racks and boxes for bulbs, gaylords for computers and TVs, and mercury spill kits. Limited site preparation may also be funded if needed.

The municipal/regional UW/mercury sheds will be able to accept:

- Lamps
- Cathode ray tubes (in TVs and computers)
- Mercury containing thermostats from homeowners
- Other mercury added products from homeowners such as thermometers, switches, barometers and button batteries
- Totally enclosed, intact PCB ballasts

As mentioned earlier the State will negotiate a statewide contract for the pickup and recycling of all these wastes. The town will call the contractor(s) when pickup service is needed. The contractor will bill each facility directly. If there is funding for State cost share, towns will submit copies of their bills to the State and will be reimbursed a percentage of the total.

Infrastructure and Education Funding: The 119th Legislature allocated a one time amount of \$438,000 from the Maine Solid Waste Fund to establish a statewide UW/mercury/HHW collection and education program. Approximately \$388,000 will be spent on funding education/outreach and 100% of the capital costs of the UW/mercury shed program. No local match will be required. Grants will be given until the funding runs out. It is hoped that the funding will cover the costs of at least 25 sheds. Limited funding will go toward the disposal of municipally generated UW/mercury wastes (\$30,000), and manometer collection, (\$5000). Approximately \$15,000 has already been spent on the collection of carbon-tet fire extinguishers and on education and outreach.

The first year may be the most costly if people have been storing UW and mercury added products. SPO will provide up to 50% of reasonable disposal/recycling costs during the first year if funds are available. Otherwise, the State will cover any reasonable costs incurred for the disposal of municipal and school wastes only.

Bond Funding: SPO has proposed a \$1.5 million bond for FY 2003 to further expand the UW/Mercury/HHW program (\$900,000) and to fund needed improvements and equipment at existing recycling facilities (\$600,000). If the bond is approved, UW/Mercury/HHW program money may fund:

1. Additional UW/mercury sheds (\$150,000);
2. Paint sheds and equipment, (\$200,000) (See Paints, page 9);
3. Education and outreach on HHW, mercury and UW (\$150,000);
4. Capital expenditures necessary for regional centers to collect additional household hazardous wastes or limited cost share of mobile collections (\$160,000);
5. Funding for recycling and disposal of municipally generated mercury-added products (\$60,000).
6. Thermometer exchanges (\$180,000).

Thermometer Exchanges: Recent publicity about the dangers of mercury has heightened public awareness concerning the use of mercury thermometers. Mercury thermometers are prevalent and easily broken. The DEP receives calls daily from the public about broken mercury thermometers and associated health issues. Public concerns have led to thermometer exchanges in other states and, to a limited degree, in Maine.

In order to satisfy a growing public concern and the real environmental risks, a statewide thermometer exchange program is recommended. The logistics could mirror the thermometer exchange held in Vermont during the first two weeks in February, 2001. Thermometers would be bulk purchased by the State and distributed to participating pharmacies. The State would advertise the exchange and during a particular time period a citizen could go to a participating pharmacy with a mercury thermometer and exchange it for an alcohol or digital one, free of charge. The State's contractor would pick up the mercury thermometers for disposal at the end of the exchange timeframe.

Thermometer Exchange Funding: Maine has a population of 1.28 million people (2000 census), and approximately 480,000 households. Planning on ten percent of Maine households participating in a thermometer exchange, the State should purchase approximately 48,000 thermometers for distribution. Current bulk costs are \$2.80 for an alcohol based thermometer and \$3.00 for a digital. To adequately fund the program the budget can be broken down into two major components:

Thermometer purchase: \$150,000 (48,000@\$3.00/each with \$6,000 as a contingency to cover additional thermometer purchases if necessary).

Disposal of mercury: \$30,000 (based on 100 participating pharmacies collecting a 5 gallon bucket of thermometers and a disposal cost of approximately \$250/bucket with \$5,000 as a contingency fund to cover additional disposal costs if necessary.)

Total budget is \$180,000. If the exchange were to happen within the next 6-8 months, it would need separate funding than other activities discussed within this document, which are based on existing, limited funds or a pending bond request.

B. Establishing the Infrastructure to Handle Paint, Batteries, PVC Plastics, Propane Cylinders, and Household Cleaning Products

During the remainder of FY 2001 through FY 2002, DEP will also work to establish management systems for paint, button cell batteries, PVC plastic, propane cylinders, and household cleaners. Section C below describes the actions DEP and SPO will take during FY 2002 to FY 2003 DEP to establish on-going management systems for pesticides, pool chemicals, waste oil and antifreeze, electronics other than those with CRTs, and pharmaceuticals.

Paints: Paints are by far the largest waste stream by volume collected at most HHW events, usually accounting for at least 50% of the wastes collected. Paints are generally thought of as a problematic, nonhazardous waste. Notable exceptions to this include marine paints, oil based paints, and latex paints manufactured prior to 1990. Although this sounds like a lot of exceptions, the bulk of the paints sold in the last ten years and stored in homes presently is nonhazardous latex.

Paint is the waste of highest concern to waste managers after UW and mercury added products. This is because of the sheer volume of waste paint. After the UW/mercury shed program is underway, the State will focus its management efforts on paint. Transfer stations can presently collect latex paint but most don't due to handling and disposal issues.

Collection and Management: A long-range plan could be to adopt the British Columbia system of EPR and adapt it to Maine. Paint can successfully be recycled and resold, and new businesses are developing to fill the market niche. (See Appendix E for examples). Until EPR can be put in place, paints should be collected, bulked and either given away, sold at a minimum cost, or in the case of oil-based paints and thinners, sent for fuel blending (blending with petroleum products to use as a fuel). Latex can presently be handled at transfer stations with guidance from the State. A shed program similar to that for UW and mercury-added products would make it easier and more inviting for more solid waste facilities to accept paint.

If the proposed \$1.5 million bond for recycling and HHW collection passes, the State will fund a shed program for paint collection (FY 2003) similar to the shed program for UW and mercury added products. This would entail the State providing the needed buildings and equipment, and brokering a recycling contract. Facilities would also be able to bulk latex paint onsite and give or sell the paint back to homeowners, paint contractors, non-profit organizations, etc. As part of this program the State would engage in a strong educational campaign. Under the State contract, oil based paints would also be collected and sent for fuel-blending.

Summary of proposed actions:

- Participate in regional efforts to encourage Extended Product Responsibility. (ongoing)
- Develop a guidance document for use by recycling and solid waste facilities on the handling and bulking of waste latex paint. (FY 2001/02)

- Research the equipment costs associated with paint bulking at permanent facilities. (FY 2001/02)
- Compile a list of paint recyclers that will accept bulked waste latex paint. (FY 2001/02)
- Work with recyclers to determine infrastructure needs. (FY 2001/02)
- Develop a generic flyer for towns to give to residents about paint collection and management. (FY 2001/02)
- Work with State Purchasing to give preference to the use of recycled paint. (FY 2002)
- Develop a survey to be sent to public institutions to determine the interest in recycled paints and to identify potential volume demand. (FY 2002)
- Develop and conduct pilot demonstration projects using recycled latex paint. (FY 2002/03)
- Develop a grant program to help municipal facilities purchase equipment to bulk paint if funding allows. (FY 2003)
- Deploy paint sheds if funding allows, using the same process as the UW/Mercury shed program. (FY 2003)
- Conduct training workshops for recycling and solid waste facilities on the handling and bulking of waste latex paint. (FY 2003)
- Work with paint contractors to promote use of recycled paint. (FY 2003/04)

Batteries: The method of battery collection depends on the battery type. Alkaline batteries manufactured in the U.S. have no added mercury, making it acceptable to dispose of them with the regular household trash. Ni cad batteries are recyclable and the manufacturer funded Rechargeable Battery Recycling Corporation (RCBC) has operated a collection program for consumers for the last few years. This program is being expanded by RCBC to include lithium, nickel metal hydride, and small sealed lead acid batteries. Automotive lead acid batteries (car/marine batteries) are also recyclable and have a well-established collection program. The last of the battery types, the button batteries, are in watches, hearing aids, and many household items, including toys. These batteries contain mercury. The quantity of button cell batteries may increase as mercury fever thermometers are phased out in favor of digital types. Some jewelry stores and larger retailers recycle button cells now. The State will work on expanding and publicizing the network of jewelers that will accept and recycle the batteries from the public.

Collection and Management: Button batteries can be collected at the point of sale. This includes retail stores, jewelry stores and places that sell hearing aids. Like the thermostat program, the State will provide jewelers with recycling boxes that can be shipped when full. This program should be in place in 2002.

Summary of proposed actions:

- Develop a survey for jewelers, hearing aid centers and retail stores about their battery handling practices. (FY 2002)
- Develop a recycling infrastructure and program to distribute collection boxes to appropriate businesses. (FY 2002)
- Develop materials to increase public awareness of recycling options. (FY 2002)

PVC Plastics: Polyvinyl chloride (PVC) and polyvinylidene chloride (PVDC) are part of a group of polymers commonly known as “vinyl”. Typical household applications include film wrap for meat, water and cooking oil bottles, shower curtains, window frames, drainage pipes, garden hoses, checkbook covers, truck bed liners, and vinyl siding on buildings. Approximately 75% of PVC use is in the construction industry. Multiple scientific studies indicate there may be serious health and environmental concerns surrounding the disposal of PVC products. One immediate concern is that this type of plastic contains a high percentage of chlorine compounds. When burned in an incinerator, it can create dioxin and furans.

During 2001 the recycling brokers, including the Maine Resource Recovery Association, will work with Waste Management Inc. (WM) and towns to recycle some PVC products along with other common plastics, #1 through #7. Waste Management recently acquired a recycling plant in North Carolina that can take a mix of plastics and they will sign long term contracts.

Collection and Management: An Extended Product Responsibility program that recycles PVC is the preferred option. Limited recycling of construction PVC has happened in other areas of the country. If the recycling infrastructure can be put into place, PVC from the construction industry could be collected, stored at transfer facilities, etc. and shipped for recycling. Collection of #3PVC (mostly water and cooking oil bottles) could either be at point of sale, like beverage containers, or at recycling centers like other grades of plastic. Presently an important barrier to recycling is that identification of most PVC is not required. The requirement to stamp or label all PVC with the recycling logo that denotes the type of plastic would be key to diverting it from incineration.

Summary of proposed education and outreach activities

- Participate in regional efforts to encourage Extended Product Responsibility of PVC products. (FY 2002/03)
- Develop educational brochure on prohibition of open burning of plastics, including PVC; distribute through local fire permitting process. (FY 2002)
- Work with NEWMOA to collect background information on PVC waste and its current management options, develop policy options for preventing and reducing the release of dioxin from dioxin-forming products, and delineate alternatives to the use of dioxin-forming products. (FY 2002)
- As funding is available, assist municipalities in diverting PVC waste from municipal waste combustion. (FY 2003)
- Explore recycling options and develop infrastructure. (FY 2002/03)
- Develop materials to increase public awareness of recycling options. (FY 2002/03)

Propane Cylinders: In response to survey this past fall, many propane dealers in Maine expressed a willingness to work with the state to establish a system for collecting and safely handling propane cylinders. Since many people bring their tanks to their local solid waste facility, it makes sense to build a collection network that may include transfer stations and disposal facilities.

Collection and Management: The key to safely handling propane tanks is to be able to ascertain which tanks are empty, and to have only licensed dealers handle tanks that have any pressurized gas remaining. Transfer stations can act as collection points for empty tanks if a local dealer does not want to provide that service to the town.

Summary of proposed actions:

- Develop a guidance document for municipalities that describes options for providing for reuse/recycling of propane tanks. This will include a list of propane dealers who provide a tank emptying service. (FY 2001)
- Develop and offer a training program for solid waste facility operators in the safe handling of propane tanks, including preparation for recycling. (FY 2001/02)
- Distribute information for homeowners on recycling options to towns for dissemination to the public. (FY 2001/02)
- Identify propane dealers willing to take canisters for emptying; connect these dealers with local solid waste facilities to establish a safe handling and recycling system. (FY 2001/02)

Household cleaning products: Like pesticides, the use of cleaning products goes beyond the home, to daycares, schools and offices. In specific situations household cleaners are thought to trigger asthma attacks and aggravate other respiratory conditions. Using national data for the rates of self-reported asthma for 1994, it is estimated 64,000 Maine people, including 17,000 children, have asthma. In 1980, the number was 36,000 overall, 9000 of whom were children. Nationally the self-reported asthma rate has increased by 75% between the years 1980 and 1994. Household cleaners are also responsible for a significant number of poisonings, especially of children.

More so than any of the other wastes discussed in this document, education about source reduction and less toxic products is the key. The DEP and others have developed some HHW educational materials but have never 'marketed' these materials through a comprehensive education program. Much more can be done.

Collection and Management: Household cleaners are typically a very small percent of the total wastes at HHW collection events (+/-1%). People tend to use them up, or dispose of them down the drain or in the garbage. Given these facts, the State may want to focus its efforts on the development of an education program rather than developing a collection scheme.

Summary of proposed actions:

- Develop an 'alternative product' list based on agreed upon criteria (developed with the assistance of an advisory subgroup). Many such lists have been created; and review of existing criteria will be helpful. (FY 2001/02)
- Develop educational materials on source reduction and less toxic alternatives for schools, day cares, public institutions, and homeowners. (FY 2001/02)
- Market the educational materials through methods tailored to the audience, including giving talks at PTA, Garden Clubs, League of Women Voters meetings etc. (FY 2002/03)
- Work with State Purchasing to give preference in State bids to less toxic or nontoxic alternatives. (FY 2002)

- Develop TV/radio public service announcements on less toxic alternatives to increase public awareness. (FY 2002/03)

C. Strengthening the Infrastructure to Handle Waste Oil and Antifreeze, and Establishing the Infrastructure to Handle Electronics, Pesticides, Flammables, Pool Chemicals, and Pharmaceuticals.

The second phase of establishing a HHW collection system entails strengthening the infrastructure system for waste oil and antifreeze, and setting up a permanent system for electronics (as needed), pesticides, pool chemicals, flammables, and pharmaceuticals. The latter four wastes are destined for disposal and are some of the most dangerous wastes homeowners could handle.

Waste Oil: As previously noted, Maine has the Maine Oil Recycling Program, (MORP). DEP estimates that 4.8 million gallons of used oil are discarded every year. One gallon can be re-refined into 2.5 quarts of high quality motor oil. Oil refiners start with forty-two gallons of crude oil and use a third more energy to produce the same quantity of high-quality motor oil, as well as other less valuable byproducts!

In 1996 the Legislature enacted PL 1995 Chapter 573 to provide incentives for oil recycling. Despite this, the number of known facilities that accept used oil from the public has declined over the years. DEP staff indicate that if this is the management option of choice, additional education and outreach activities will be needed.

Collection and Management: Collection by businesses is voluntary. Presently there are 49 businesses listed in the MORP booklet. Some may take oil for free, others charge. There may be more that accept waste oil but do not want to participate in a state program. Some transfer stations also accept waste oil. DEP staff have observed general satisfaction with the structure of MORP. Still, there seems to be a need to increase the number of receiving facilities.

Summary of proposed actions:

- Conduct training workshops for recycling and solid waste facilities on waste oil handling. (FY 2002)
- Actively try to enlist more facilities into MORP. (FY 2003)
- Work with waste oil recyclers and waste facilities to determine additional infrastructure needs. (FY 2004)
- Develop educational material for towns to give to residents about waste oil management options. (FY 2004)
- As funding permits, develop TV/radio public service announcements for MORP to increase public awareness. (FY 2004)

Antifreeze: There are two types of antifreeze, ethylene glycol and propylene glycol. Of the two, propylene glycol is the less toxic, but advertising claims of it being non-toxic are misleading. Neither type should ever be dumped on the ground or put in a septic or sewer system. Both types of antifreeze can be recycled, although they must be kept separate if the recycled antifreeze is to be used again (which is the point of recycling!). Some garages may have a recycling unit that results in no waste antifreeze. These

units, which will handle either type of antifreeze, cost around \$2100. Businesses without these units usually drain the old antifreeze and replace it with new. If properly managed, the waste antifreeze will then be shipped off site for recycling.

Auto makers are using the propylene glycol more and more in new cars. In addition, 'extended life' antifreeze is marketed for engine use to 150,000 miles. So, over the next decade waste antifreeze volumes are expected to decline.

Still, there is waste antifreeze being generated by homeowners. Presently there aren't any good options for disposal, unless the homeowner can find a garage to take it.

Collection and Management: There are three potential avenues for collection. The long range goal may be an Extended Product Responsibility program. The second option would be for the State to develop an incentive program for garages to recycle waste antifreeze, similar to the MORP system. Lastly, a transfer station, public works garage or DOT facility might collect antifreeze and either recycle it on site, or ship it off for recycling. This last option holds the most potential for a short-term solution.

If municipalities are interested in recycling antifreeze, the State may choose to fund the purchase of the recycling units. If municipalities are interested in simply collecting antifreeze for off site recycling the State could contract for pickup.

Summary of proposed actions:

- Participate in regional efforts to encourage Extended Product Responsibility of waste antifreeze. (FY 2002/03)
- Consider a grant program for towns that would like to purchase a recycling unit. (FY 2002/03)
- Develop a list of the names of participating garages to include in the MORP booklet. (FY 2002/03)
- Distribute information on antifreeze management to towns for dissemination to the public. (FY 2002/03)
- Assess the need for radio/TV PSAs or other advertising. (FY 2002/03)

Electronics: Electronic products account for approximately four percent of the municipal waste stream, and the disposal rate is expected to increase three to five percent each year. Nationwide, over 20 million computers became obsolete in 1998. By 2007 an estimated half-billion computers will be discarded nationally. Presently most of the discarded products are landfilled or incinerated. Most TVs and computer monitors have between five and eight pounds of lead, as well as other toxic metals.

Sony is now taking back their discarded products from consumers in Minnesota and would like to extend their program to all states. Electronic Extended Product Responsibility will soon be the norm in Europe. Manufacturers are gearing up to recycle their 'e-scrap'. Recycling infrastructure is developing at a rapid pace. In the United States, Waste Management (WM) has eight e-scrap facilities across the country. The WM facilities have the ability to sort and recycle 60 million pounds of electronics per year. Other e-scrap recycling businesses are developing within New England.

Collection and Management: The preferable long-term strategy is to have the manufacturers take back all electronic wastes for recycling. Presently Maine businesses have to handle computers and televisions as Universal Waste because of the lead and other heavy metals. As explained earlier in this document the State will issue a contract in 2001 that municipalities may participate in for the recycling of all UW. Until an Extended Product Responsibility system is in place, most waste electronics can be directed to the ever-growing number of recyclers.

Summary of proposed actions:

- Participate in regional efforts to encourage Extended Product Responsibility. (ongoing)
- Work with recyclers, charities, municipalities, and waste facilities to determine infrastructure needs. (FY 2001/02)
- Develop a guidance document for use by recycling and solid waste facilities on the handling of e-scrap. (FY 2001/02)
- Develop educational material for towns to give to residents about management options for their e-scrap. (FY 2001)
- Compile a list of e-scrap recyclers. (FY 2001/02)
- Work with the commercial disposal facilities and charities to become regional e-scrap collection centers for shipment to recycling facilities. (FY 2001/02)
- Develop a training module for recycling and solid waste facilities on handling e-scrap. (FY 2002)
- Work with State Purchasing to give preference in State bids to electronic products by companies with take back programs. (FY 2002)

Pesticides: The issues surrounding pesticide use and disposal in Maine are extremely complex. All sectors of the population use pesticides: homeowners, schools, government, farmers and other businesses. Each year the DEP and Department of Agriculture hold a one-day collection of unwanted pesticides in Portland, Augusta, Bangor, and Presque Isle. Funds (\$13,000 in fy '01) for this collection come from the U.S. EPA to the Department of Agriculture. Since the budget is typically so small, little to no advertising is done.

Unlike many other states, Maine does not have readily available data on pesticide sales that could be used to forecast the waste pesticide volumes and toxicities. The Department of Agriculture does receive both restricted use sales records from pesticide dealers and general use sales records from wholesalers, but does not have staff to input the data into a database, nor to enforce the reporting requirements. The lack of data makes it difficult to do strategic planning for source reduction and waste collection actions.

Collection and Management: Like paint, the long-range plan for collection of unused pesticides could be to adopt the British Columbia system of Extended Product Responsibility and adapt it to Maine. British Columbia experienced an initial surge of waste pesticide returns, but as old stocks were cleared out, returns have dropped substantially.

In the short term waste pesticides still demand government sponsored collection. Collected pesticides are almost always disposed of.

Summary of proposed actions:

- Participate in regional efforts to encourage Extended Product Responsibility of unwanted pesticides. (FY 2002/03)
- Work with the Department of Agriculture to develop and disseminate educational materials for schools, day cares, public institutions, and homeowners on Integrated Pest Management. (FY 2002)
- Support the Department of Agriculture's request to fund the input of pesticide sales records into a database and an expanded door-to-door collection program. (as needed)
- Work with the Department of Agriculture to better advertise annual regional pesticide collections. (as needed)

Flammables: Flammables include waste gasoline, fuel additives and solvents. They tend to be one of the larger wastes by volume, usually comprising 15% to 20% of total hazardous wastes collected.

Collection and Management: A door-to-door pickup system is preferable due to the hazards of homeowners transporting liquid flammables.

Summary of proposed actions:

- Issue a Request for Proposals to ascertain the costs of a door-to-door collection system modeled after the current DEP/AGR pesticide collection program, and compare the cost to the cost of upgrading existing collection facilities or establishing new ones. (FY 2002)
- Work with municipalities to explore the various options for funding collection. (FY 2002)
- Work to establish collection system. (FY 2003)
- Develop an advertising campaign about the availability of the collection system. (FY 2003)

Pool chemicals: The list of potential pool and hot tub chemicals is long and complicated. Every year homeowner accidents involving pool chemicals are reported to the Poison Control Center and local hospitals. Proper storage and safe handling are crucial because these chemicals are reactive and toxic to humans, pets and plant life.

Collection and Management: A door-to-door pickup system is preferable due to the hazards of homeowners transporting these chemicals and the potential for improper storage at transfer station.

Summary of proposed actions

The proposed collection of pool chemicals is the same as for pesticides above. Proposed actions and timelines are also the same so the reader is directed to the above section on proposed actions for pesticides.

Pharmaceuticals: Pharmaceuticals are a small but very important component of every household's waste stream. Unused pharmaceuticals pose a significant health, safety and environmental hazard when improperly stored or disposed.

Collection and Management: Pharmaceuticals, especially prescription drugs, are expensive. Programs do exist in Maine to take back unused prescription drugs and redistribute them to patients who cannot otherwise afford them. These programs are few and little known. Redistribution is the preferred management option, and collection should be through the doctor's office and/or pharmacy. Otherwise, adoption of an Extended Product Responsibility program is the next best management technique. Finally, annual door-to-door collection is a third, but less desirable option.

Summary of proposed actions:

- Support the development of the infrastructure to collect unwanted pharmaceuticals for disposal. (FY 2003)
- Research drug redistribution programs in Maine. (FY 2003)
- Participate in regional efforts to encourage Extended Product Responsibility of unused prescription drugs. (FY 2004)
- Develop a list of health centers that would redistribute prescription drugs to the needy. (FY 2004)

D. Liability Issues for municipalities

The liability of operating a HHW collection center is no greater than the current liability of operating a landfill, incinerator or transfer station, since these HHW are already handled by these facilities. Liability management is a function of proper training, appropriate procedures and adequate facilities. There are more than 400 permanent HHW collection facilities in the U.S. and yet there has never been a 'significant event' reported. Still, if a municipality chooses to develop a permanent HHW facility, there are several issues to consider carefully. These include the service contract, state and federal permits, generator status, liability insurance and emergency preparedness.

1. Service contracts. At most established municipal or regional facilities in other parts of the country, the owner contracts with a vendor to operate the facility. To assist Maine municipalities, SPO will develop a model service contract(s) to ensure that the liability issue is clearly contracted to the vendor. The contract will specify the services, permits and insurance to be provided by the vendor, the cost of all services, and the provision that the vendor assumes all liability. The State may also negotiate a contract price for municipalities; this will encourage a reduction in contracted costs due to the economies of scale and potential for logistical coordination.
2. State and Federal Permits: Household hazardous wastes are exempt from the hazardous waste provisions of the federal Resource Conservation and Recovery Act (RCRA). This means that homeowners who generate HHW are not required to comply with the hazardous waste regulations controlling the generation, transport or disposal of hazardous wastes. However the collection and storage of HHW is

regulated by the Maine Department of Environmental Protection (DEP). Municipalities that choose to have a permanent collection facility at their existing solid waste facility will need to apply for a minor revision to their license and amend their Operating Manual to include all procedures for handling, storage and removal of HHW. The DEP is planning to work very closely with those towns that choose this option.

3. Generator Status: The service contract that the State develops will clearly state that the contractor becomes the generator of the hazardous waste it accepts. This protects the municipality from any future liability. The generator will be wholly responsible for complying with all state and federal hazardous waste regulations regarding the generation, transport and disposal of HHW, including all manifest requirements.
4. Emergency Preparedness: The State will develop specifications for municipal storage buildings for Universal Wastes, and depending on the level of municipal interest, may “bulk buy” these sheds as requested by the municipalities . All sheds for UW collection should be supplied by the State or built to State specifications and supplied with emergency spill kits. The State will also provide training workshops for all municipalities that receive a UW storage shed.

If a town wants to expand the types of HHW or problematic wastes it takes in, the State will provide specifications for any additional collection and storage facilities. If the town chooses to collect HHW only when the vendor is on site, that vendor will provide all materials and equipment necessary to handle a spill or release to the environment. However, local fire departments should always be made aware of any collection event.

5. Liability: It is important for the municipality to make sure the facility is adequate and well maintained, and that staff involved are trained to properly handle and store any hazardous materials. This is no different than measures that should be taken at any regular transfer station or landfill. These precautions provide protection against liability.

Once the vendor is on site, they become the generator. State and federal regulations identify the generator/transporter as the liable party in the event of a spill or accident.

4. Funding Options for Statewide Management System

Funding for a HHW collection system that services all of the State is possible through a number of mechanisms. There are obstacles and opportunities with each of these funding mechanisms. There are a myriad of factors that influence costs, but for this discussion, infrastructure costs can range from \$30,000 to \$150,000 per site, and operating costs can range from \$20,000 to \$150,000 per year. (See Appendices D,E and F).

Infrastructure Development Funding: The State has made a commitment to cover facility construction costs until the present \$438,000 runs out. There will be a cap on the amount allocated to each community. If a community wants a facility that the State can only partially fund, that community may want to pursue federal funding.

Federal Grants

If the State decides to establish permanent HHW collection facilities, the infrastructure costs could be covered by a Community Development Block Grant (CDBG) from HUD. This grant program is administered by the Department of Economic and Community Development and can fund up to \$400,000 of infrastructure development per project. The applicant must be a city or municipality that is not a HUD entitlement grantee (Lewiston, Auburn, Bangor and Portland are entitlement grantees), and must demonstrate how the project will benefit low and moderate income residents. It is possible that communities neighboring the larger cities or communities that currently host municipal waste combustors would have an interest in pursuing a HUD grant for establishment of a permanent collection facility.

Other federal grant programs have traditionally been available for pilot HHW collection projects. These grants tend to be used as a stop gap until permanent solutions can be implemented.

State Infrastructure Funding

General Fund: Using the State General Fund to create and operate a new collection program is arguably equitable since both the revenues and the wastes come from all of us.

State Bond: SPO has proposed a \$1.5 million dollar bond for FY 2003. Of this, \$900,000 would be used to fund additional infrastructure to collect HHW. This money, as stated previously, would be used to fund a paint shed program, upgrade facilities that wanted to expand the types of HHW they could collect, and cover limited recycling and disposal costs. The process to get a bond approved is complicated and takes a considerable amount of time. On the other hand, the people of Maine have historically been supportive of environmental bond proposals. This may be a feasible way to fund infrastructure development if the time commitment to bring a bond forth is acceptable. Bonds have traditionally not been used to cover operational costs.

State Infrastructure and/or Operational Funding

The following funding methods could be used to fund infrastructure development and/or operational costs.

Waste Fees for MSW and/or HW: This method of funding a HHW program is used in other states. The State does not presently collect any revenue on most of the MSW or on the construction and demolition debris disposed of within State borders. These waste streams could generate revenue if a per ton fee were imposed. Commercial

disposal fees charged by the receiving facility are currently around \$66/ton for MSW and \$71.50/ton on construction and demo debris. Maine currently collects revenue (a dollar to twenty-five dollars per ton) on special wastes and on MSW disposed of at a commercial facility if that facility does not have a contract with the town from which the waste originated.

The State also collects revenue on the generation of hazardous waste. The fee imposed is typically 2 cents per pound if going for disposal and 1.5 cents per pound if going for recycling. Maine generators shipped between seven and eight thousand tons of hazardous wastes in 1997, a decrease from previous years. Revenue collected goes into a dedicated account to fund the State hazardous waste program.

Product registrations fees: Maine currently charges a fee on pesticides and household products that contain registered pesticides. The fee, \$105 per EPA registration number, generated approximately \$875,000 in FY 2000. Revenues go into a dedicated account to fund the Board of Pesticide Control and other staff in the Department of Agriculture. Pesticide fees have not been increased since 1995, resulting in a revenue shortfall during the last few years. An increase in the pesticide registration fee or expansion of this system to include other products that become HHW could provide some revenue to support operational costs of HHW collection.

Burning permit fee. Maine has recently amended its open-burning law to prohibit the burning of plastics and certain other solid wastes in backyard burn barrels. Enforcement of this provision is the responsibility of local fire chiefs and wardens. The State could charge a burn permit fee, with the proceeds used to support local enforcement efforts as well as DEP educational and HHW initiatives related to PVC.

Advance collection fees: This revenue method is not new in Maine. Maine citizens currently pay an advance deposit on most beverage containers, on lead acid auto batteries and on tires. These advance fees are managed by the State. In other countries advance fees are connected to Extended Producer Responsibility programs and are managed by the manufacturer. Either type of deposit system is feasible, but there are obvious advantages to private sector management of the potential revenues, with public sector oversight.

As previously noted, when advanced collection fees are imposed by manufacturers, the fee is either internalized within the cost of the product or visible as an 'eco fee'. In most cases this is at the discretion of the manufacturer. If visible, it can act as a tool for heightening public awareness of waste issues, or it can result in public complaints.

Lastly, advanced collection fees encourage consumers to purchase the least toxic or non-toxic product. Because only the purchaser of the product is charged, it may be considered a more equitable method of funding the management of HHW and problematic wastes.

Locally Funded Operational Costs

In states outside of Maine, HHW operational costs are often covered through the collection of local funds. Below are the methods used in other places.

Membership fees: A town could opt to join a regional collection program which may fund HHW operational costs through a membership fee. In this scenario, a town could vote at annual town meeting to join a regional program, which could establish membership fees based on a flat rate, a per capita rate, or some combination of the two. This system is already in use in Maine and elsewhere for funding regional waste facilities and some regional recycling centers. It is an established way of paying for public infrastructure and programs. If costs for a HHW collection program were spread out in this manner, the financial impact on individuals would be negligible.

User fees: Some facilities in other states charge a user fee at the collection event. Although this may seem equitable, it will discourage a portion of the population from participating at all. In other states, collection facilities charge businesses a user fee, but do not charge private citizens. The fees coming from businesses may not cover the total operational costs, but certainly help to defray them.

Water and sewer bills: Tempe, Arizona funds their HHW collection through a charge on the water and sewer bills. This seemed logical to them because without the collection, a portion of the HHW was ending up in the treatment plant. Tempe basically redirected their income to pay for education and collection rather than treatment. If adopted in Maine, it would put more responsibility on the municipalities for funding HHW collection than some of the other options.

Allocation of state funds: The State needs to determine how best to distribute state funds, as available, for both infrastructure development and some operational costs. Options include direct grants to towns or counties, direct contracting for collection services, a per capita allocation, allocation based on recycling rates, or any combination of these options. State government has experience in all these management mechanisms.

5. Conclusion

The HHW problem, while complex, is not insurmountable. The solution will be a patchwork of collection options, based on the waste stream, funding, and the geographic area. The State will have to work closely with interested municipalities to identify a collection program that will fit their individual or regional needs. The State also has a role to be a strong advocate for Extended Product Responsibility wherever possible. Europe has blazed a new path and we have the benefit of learning from their efforts. By insisting on manufacturer responsibility for wastes, product design changes are being made that will help us all on the road to a sustainable future.

Appendix A – HHW Plan Advisory Committee

First Name	Last Name	Affiliation	Mailing Address	Town/City	Zip Code	Phone
Mark	Arienti	RWS	64 Blueberry Road	Portland	04102	773-1738
Mike	Belliveau	Natural Resources Council of Maine	3 Wade St.	Augusta	04330	622-3101 x212
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Jim	Dube	Town of South Berwick	Main St.	Berwick	03908	384-3300
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Brenda	Libby	Casella/KTI	110 Main St., Suite 1308	Saco	04072	286-1668 x402
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Sam	Morris	SPO	38 SHS	Augusta	04333	287-8054
Ann	Pistell	DEP	17 SHS	Augusta	04333	287-7703
Cherrie	Plummer	DEP	17 SHS	Augusta	04333	287-7882
Alan	Prosser	Alan's Auto	195 St. John St.	Portland	04102	775-0968

Appendix B – Worldwide Product Stewardship Initiatives

The list is not exhaustive but is meant to give the reader a brief overview of the types of programs that are currently in place or are agreed upon and under development.

Minnesota: The state has recently entered an agreement with Sony and Waste Management, Inc. to take back Sony's electronic and personal computer products at the end of their useful life. The program is the first in the nation for electronics. Products are brought to one of three Waste Management sites on specific days for free recycling. Sony has stated that it needs to expand this program beyond the Minnesota borders in order to make the recycling program sustainable. Sony's cost is currently about 8 cents per pound, but Sony anticipates that costs would go to zero if the program can operate in all fifty states with other electronics firms participating.

United States: In 1995, members of the rechargeable nickel-cadmium battery industry established the Rechargeable Battery Recycling Corporation (RBRC). With the help of over 28,000 retailers, the RBRC launched a nationwide industry-funded recovery system to recycle nickel-cadmium batteries. Batteries are collected at retail sales locations. Recently, Hunnewell and General Electric established the Thermostat Recycling Corporation (TRC) to collect used mercury thermostats at wholesalers. TRC accepts all makes of mercury thermostats and recycles the mercury from them. The concept of EPR is beginning to be discussed in policy-making circles in the U.S., but there are no laws requiring cradle-to-grave responsibility of manufacturers.

International Approaches: Europe, Asia, Canada and most recently Latin America are embracing waste policies that ask the private sector to get involved in managing products at the end of life. The approach and scope of the policies varies greatly depending on the country and product, but the trend is moving toward manufacturers, and in some instances, distributors and retailers having product stewardship responsibilities. This approach relieves local governments of the full responsibility for managing products once they become waste.

Germany: Germany was the first nation to institute a comprehensive product stewardship approach, passing a law in 1991 requiring manufacturers to assume the costs of collecting and recycling used packaging. Driven by a shortage of disposal capacity and rising costs, the German government viewed manufacturer responsibility as a vehicle to reduce costs for local governments and as a tool to encourage packaging reduction and increase recycling.

Manufacturers in Germany responded to the packaging law by establishing a non-profit company called DSD to operate the collection and recycling program. DSD created and licensed a logo (Green Dot) for manufacturers to put on their products. The collection and recycling system for packaging is funded by the companies that pay for the use of the Green Dot logo.

Germany also has worked with Sony and Siemen's Eco to take back their computers at the end of the products useful life. Since 1996 Sony has issued a take back label for its computers, which means the computer can be returned to any one of 800 collection points in Europe for recycling. Siemen's Eco computers can be returned to distributors free of charge at the end of their product life and are then sent to a recycling facility.

The European Union: Germany's packaging law inspired similar efforts among Germany's European neighbors. In an effort to create consistency between the various national laws, the European Union developed a directive on packaging in 1994. Now the concept of product stewardship is being expanded to other products, most notably scrap cars and electronics waste. Currently electronics takeback is mandatory in the Netherlands, Norway, Denmark, Sweden, Switzerland and parts of Belgium. In the United Kingdom, Motorola has partnered with network providers to enable customer returns of cell phones to Motorola distributors.

Moving beyond end-of-life management goals, the European Commission has drafted two directives concerning electronics. The Waste Electric and Electronic Equipment (WEEE) directive seeks to implement a more comprehensive product stewardship approach by establishing recovery and recycling goals for a wide range of electronics, from tools to toys to TVs and computers. The second directive establishes design standards that target the removal of brominated flame retardants and heavy metals such as lead, cadmium, mercury and hexavalent chromium from electronic products by 2004. In an attempt to close the recycling loop for material recycled from waste electronics, the draft directive also calls for manufacturers to utilize at least five-percent post-consumer plastic in new products. The draft directives are expected to be finalized in 2001.

Brazil: Brazil is following the European lead by proposing regulations that would require producer responsibility for electronic equipment waste.

Japan: One of the most recent product stewardship laws to appear on the international scene is the Japanese program for recycling certain waste electronics. Japan's Electric Home Appliance Recycling Law was adopted in May 1998, and will go into effect in 2001. This new law targets televisions, refrigerators, air conditioners and clothes washers, with additional products likely to be added in the future. This legislation can truly be classified as shared responsibility among all the parties involved in a product's life. Consumers are responsible for paying a fee for recycling and making sure the product is delivered to a recycling collection point. Retailers are asked to accept used appliances and then are responsible for transporting used product to the manufacturer. Finally, the manufacturers and/or importers must ensure that the product is recycled and that the take-back scheme is in place.

The Japanese approach offers a few unique twists in implementing a producer responsibility program. First, retailers are explicitly named as a possible collection point for waste electronics. Second, consumers pay a fee at the time of disposal, as opposed to asking manufacturers to incorporate the end-of-life management costs into the sale price of the product.

The Japanese law has spurred manufacturers to invest in electronics recycling facilities and explore new practices. For example, Panasonic has reduced the number of components in a television to facilitate recycling. The company has also reduced the number of plastic resin types so that plastics from their products are easily identified and sorted for recycling.

British Columbia : The Province of British Columbia has successfully instituted post-consumer product stewardship programs for solvent/flammable liquids, pesticides, paints and pharmaceuticals. In all cases the collections are the responsibility of the manufacturer and no public funds are involved. In order to fund collections and handling, manufacturers of solvents, flammable liquids and pesticides charge 'eco-fees' at point of sale. The gasoline industry has chosen to internalize their share of stewardship costs. Collectively these industries have established 35 permanent collection depots and alternate services throughout the province. Paint manufacturers have taken a similar track, forming two non-profit industry associations that operate over 100 permanent paint collection depots throughout the province. Again, eco-fees are charged. The pharmaceutical industry has established a program in which unwanted pharmaceuticals may be returned to any of 643 pharmacy outlets throughout the province. The industry has chosen to internalize program costs.

Appendix C - Types of Collection Systems

As the State and municipalities dedicate resources to managing HHW wastes and other problematic wastes in a safe and efficient manner, it is useful to understand the different types of collection systems and their advantages and disadvantages.

A. Product Stewardship Programs: Product stewardship programs, a.k.a. Extended Product (or Producer) Responsibility (EPR), in which manufacturers take cradle to grave responsibility for their product(s), are becoming more common. EPR is a policy that makes the life-cycle costs of managing a product visible to the manufacturer and the manufacturer at least partially responsible for bearing those costs. This can encourage the manufacturer to redesign the product(s) to reduce toxicity, increase longevity, and/or increase recyclability.

Wastes that are currently being handled through EPR programs in places other than Maine include: paints, electronics, pesticides, mercury lamps, mercury switches, mercury thermostats, propane tanks, flammables, pharmaceuticals and some types of batteries. Appendix B contains a brief summary of some EPR programs.

Advantages of Product Stewardship:

- ✓ Little to no public funds or infrastructure needed.
- ✓ Infrastructure to move products at end of life may already exist (by utilizing the product distribution system in reverse).
- ✓ Easy and convenient for the consumer.
- ✓ Increases consumer awareness of environmental issues and the impact of consumer choices.
- ✓ Encourages the manufacturers to implement source reduction and improve product design.
- ✓ Leads to higher recycling/reuse rates, thereby conserving natural resources.
- ✓ Shares the waste responsibility among all parties.
- ✓ Leads to new recycling or reuse opportunities.
- ✓ Prevents inappropriate disposal of hazardous and problematic wastes.
- ✓ May give participating manufacturers a marketing advantage.
- ✓ No need for volunteers or extensive government labor to collect wastes.
- ✓ No public liability.

Disadvantages of Product Stewardship:

- Difficult to convince some manufacturers to participate voluntarily.
- May require legislation and rulemaking.
- Consumers must be educated about product take back.
- Fees charged by manufacturer may discourage consumer participation.
- Different requirements from state to state make it difficult for manufacturers.

B. Periodic collection programs: Periodic household hazardous waste collection events are defined as temporary collections held in a location that is not improved for the express purpose of collecting HHW. The wastes are typically packed onsite and shipped directly to a Treatment, Storage and Disposal Facility (TSDF) or disposal facility. These types of collections have been held throughout the United States for over a decade now, including in Maine. Numbers from across the nation indicate that one day events usually attract anywhere from 1.5% to 5% of the population in the area, with people driving up to 30 minutes to participate and arriving with an average of 70 pounds of HHW and problematic wastes.

Wastes that are currently being handled through periodic collection programs in Maine and elsewhere include: paints, pesticides, some mercury added products, flammables, acids and bases, and toxic cleaning products.

Advantages of periodic collection programs:

- ✓ Increases consumer awareness of environmental issues and the impact of consumer choices.
- ✓ Leads to higher recycling/reuse rates, thereby conserving natural resources.
- ✓ Can lead to new recycling/ reuse opportunities.
- ✓ Prevents inappropriate disposal of hazardous and problematic wastes.
- ✓ Can charge a fee from participants.
- ✓ All CERCLA liability is on contractor who becomes the generator and provides insurance and indemnity.

Disadvantages of periodic collection programs:

- Typically requires public funds.
- Typically has higher per pound cost than manufactures' take back programs or a permanent collection facility.
- Time consuming to organize.
- Not always convenient for public to participate, leading to low participation rates.
- Often has limited scope of acceptable waste products.
- Public must transport hazardous wastes to collection, increasing health and environmental risks.
- Does not encourage manufacturers to implement source reduction or design products for recycling and sustainability.
- Does not share the waste responsibility with the manufacturer.
- Can be weather dependent.
- Tend to be sporadic, dependent on funds.
- Difficult to distinguish household and SQG wastes during collections.
- Participants may show up with unknown or inappropriate wastes.
- May rely on volunteers to do some part of the collection activities.

C. Door-to-door collection: Door-to-door programs are collections of hazardous waste from a resident's household or from a SQG business. Typically this type of event is coordinated by a governmental entity, with pickups done by a contractor. The citizen

makes an appointment and is either present at the time of pickup, or leaves the wastes in a convenient location other than the curb.

These programs are gaining popularity. They have been successfully done in several places including the following: Middlesex, Passaic and Hudson Counties, New Jersey; Lehigh, Northampton, Monroe, and Schuylkill Counties, Pennsylvania; Metro District, Portland, Oregon; and King County, Washington.

Wastes that are currently being handled through door-to-door collection programs are the following: paints, pesticides, some mercury added products, flammables, acids and bases, aerosol cans, antifreeze, waste oil, lead acid batteries, dry cell batteries and toxic cleaning products.

Advantages of door-to-door collection

- ✓ No infrastructure needed. Government only provides funds and oversight.
- ✓ Accessible to all, including elderly and handicapped.
- ✓ Convenient for consumers.
- ✓ Increases participation rates, especially in rural communities.
- ✓ Increases consumer awareness of environmental issues and the impact of consumer choices.
- ✓ Leads to higher recycling/reuse rates, thereby conserving natural resources.
- ✓ Prevents inappropriate disposal of hazardous and problematic wastes.
- ✓ Larger quantities can be collected.
- ✓ The number of repeat users can be reduced or eliminated.
- ✓ Can exclude SQGs if desired.
- ✓ Hazardous waste is not transported by a resident.
- ✓ Program can be available year-round.
- ✓ Gives public entity the ability to set a budget and adhere to it.
- ✓ Because routes are predetermined and pickups coordinated, door-to-door collection has been found to be less expensive per pound than periodic collections or operating some permanent facilities.
- ✓ Does not rely upon volunteers.
- ✓ Can charge a fee from resident.
- ✓ All liability is on contractor who is the generator and provides insurance and indemnity.

Disadvantages of door-to-door collection

- Does not encourage manufacturers to design products for recycling and sustainability.
- Requires public funds.
- Does not share the waste responsibility with the manufacturer.
- Can make it too convenient for residents. There's little incentive for source reduction or buying environmentally preferable products.

D. Curbside collection: Similar to the collection method above except for one distinction. Waste is left unattended at the curbside, and is picked up on a regularly scheduled day, similar to the collection of normal household trash.

Advantages of curbside collection

- ✓ Same as those for Door-to door collections. (See above).
- ✓ No need for resident to make an appointment for pickup.
- ✓ Same system of collection that resident may already use for MSW and for recycling nonhazardous wastes.

Disadvantages of curbside collection

- Does not encourage manufacturers to design products for recycling and sustainability.
- Requires public funds.
- Hazardous wastes are left unattended and available to children, animals and increased environmental risk.
- Can be weather dependent.
- Can make it too convenient for residents. There's little incentive for source reduction or buying environmentally preferable products.
- Does not share the waste responsibility with the manufacturer.

E. Permanent collection facilities: A permanent collection facility is generally thought of as a fixed facility that collects a particular HHW product or products on an on-going basis. In Maine, the following places may serve as permanent facilities:

- *Transfer Stations and Recycling Facilities
- *Retail and wholesale outlets
- *Charity organizations
- *Propane dealerships
- *ME Oil Recyclers Program Participants

Transfer stations and recycling facilities are being used throughout the United States to collect HHW either for reuse, recycling, fuel blending or disposal. Some are setup for the sole purpose of collecting HHW and perhaps hazardous wastes from Small Quantity Generators (SQGs). Others are part of a comprehensive facility that also handles municipal solid waste. In Maine, transfer stations and recycling centers are allowed to handle waste oil, universal wastes, paints, and propane tanks provided they follow regulatory and safety guidelines. Appendix C contains some examples of permanent HHW facilities in other parts of the country.

Charity organizations have traditionally taken donations from the public, including such items as computers and televisions. Electronics are the only category of Universal or hazardous waste the charities typically accept. In Maine the established charity organizations are Goodwill Industries and the Salvation Army; these organizations do not currently have a program for accepting significant numbers of computers or CRTs.

Many propane distributors in Maine have indicated they are willing to accept used propane tanks from their customers. They would either refit the tanks with new valves or scrap those tanks that can't be retrofitted. It is up to the individual dealers whether they would charge the customer for this service. Wal Mart and some other retailers are also willing to accept old propane tanks, free of charge, if the customer buys a new 'Blue Rhino' brand tank from them. Once the customer owns a 'Blue Rhino' tank, they have to return to a Blue Rhino dealer to have it refilled.

ME Oil Recyclers Program (MORP): This program has been in existence for at least ten years. Typically MORP facilities are gas stations/auto repair businesses that have a waste oil burner for heating. The businesses accept waste oil from the public. A few also accept waste antifreeze for on site recycling.

Advantages of permanent collection facilities

- ✓ Infrastructure may already be in place.
- ✓ Convenient for consumers.
- ✓ Can be open year round and is not typically weather dependent.
- ✓ Increases participation rates, especially in rural communities.
- ✓ Increases consumer awareness of environmental issues and the impact of consumer choices.
- ✓ Leads to higher recycling/reuse rates, thereby conserving natural resources.
- ✓ Prevents inappropriate disposal of hazardous and problematic wastes.
- ✓ Large quantities can be collected.
- ✓ Leads to new recycling or reuse opportunities.
- ✓ Does not rely upon volunteers.
- ✓ Variety of funding options.
- ✓ Same system of collection that resident may already use for MSW and recycling nonhazardous wastes.

Disadvantages of permanent collection facilities

- May be hard to site if new.
- Does not encourage manufacturers to design products for recycling and sustainability.
- Requires public funds.
- Responsible public entity assumes generator liability.
- May be inconvenient for elderly, handicapped and very rural populations.
- Public must transport hazardous wastes to collection, increasing health and environmental risks.
- Does not always share the waste responsibility with the manufacturer.

Appendix D - Cost Analysis by Collection and Management Methods

The different types of collection methods have varying associated costs. Generally product stewardship programs, charity collections, and programs run by the propane dealers and MORP participating facilities do not involve public money, although they may require a “user” fee. Therefore they will not be examined in this report although there are costs to the organizations/businesses involved.

The other four types of collection programs, periodic, door-to-door, curbside, and permanent facilities, typically all involve public money. When examining program costs from around the U.S. and Canada discussion is hindered by different methods of collecting cost data. Costs may be given in terms of number of households served, number of participants, or cost per pound or gallon. Programs track expenditures differently, and the services and composition of wastes handled may vary considerably. Because of these issues the North American Hazardous Materials Management Association (NAHMMA) and the Solid Waste Association of North America (SWANA) have recently proposed a web-based cost comparison tool for use by waste managers throughout the country. If adopted by managers the data base would provide a mechanism to collect and compare a consistent set of data on the costs of running the various types of HHW and recycling programs.

A few costs for the various types of programs are available through researched literature.

Periodic collections: Costs for three recent collections are reported.

The Cape Cod Commission in Massachusetts collected 30,901 gallons and 9,705 pounds of wastes in 1999 at a total cost of \$124,962. Converted to pounds and assuming a gallon weighs 8.34 pounds, Cape Cod collected 267,419 pounds of waste. **This works out to approximately \$.47/pound.**

A recent collection coordinated by AVCOG in Maine reports their current contract for a HHW collection is for \$3.60/gallon. Again, using the same assumptions as above, AVCOG collected 5,045 pounds. Their total budget was \$27,370, with \$1000 spent on educational materials. **This works out to \$5.42/pound.**

Lastly San Luis Obispo County, Ca. reported that one day collections in 1998 and 1999 cost \$490,000 to manage 318,117 lbs of HHW. **This works out to a management cost of \$1.54/lb.**

Door-to-door and curbside collections: The costs associated with these two options for a given population would be very similar except for a few minor differences. A door-to-door program usually entails the homeowner calling to set up an appointment for pickup. This would mean the organizing agency might incur administrative costs beyond those for a curbside program. Still, the curbside program has increased liability, which may translate into increased insurance costs.

The door-to-door program run in four counties in northeastern Pennsylvania reported expenditures of \$395,350 to collect 203 tons of HHW in 1999. **This represents a management cost of \$0.97/pound.** Although very attractive compared to costs for one day

collection, the per pound cost is influenced by transportation costs and would be different for Maine. Without going out to bid, it would be difficult to know how different Maine door-to-door costs would be.

Permanent Facilities: Not surprisingly the literature shows a wide disparity of costs associated with permanent HHW facilities in states throughout the country. Construction costs vary from \$60,000 for a simple facility to \$400,000 for a comprehensive new facility. Extremely limited figures were found on operational costs. They were as follows:

*Larimer County, Co. spent \$255,000 to manage 1.6 million pounds of waste. **This works out to \$.16/lb!** They allow small businesses to participate as well as households.

* San Luis Obispo County, Ca. reported the 1998/99 collection of 337,695 lbs of HHW and management costs of \$186,200. **This works out to \$.55/lb.**

Appendix E details both construction and operational costs for several permanent facilities in New England. Unfortunately pounds of HHW collected are not reported, making it impossible to calculate the cost per pound. Still, the population served is reported and this might give an idea about approximate costs for a facility sited in a more populated area of Maine.

Further research needs to be done to find reasonably accurate numbers on operational costs. If possible these costs should be broken down into overhead, labor, consumables, durable equipment, recycling and disposal categories.