FRASER RIVER ACTION PLAN

Environmental Protection for the Automobile Recycling Industry in British Columbia

DOE FRAP 1996-02

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Province of British Columbia
Ministry of Transportation and Highways

ENVIRONMENTAL PROTECTION FOR THE AUTOMOBILE RECYCLING INDUSTRY IN BRITISH COLUMBIA

Volume 1 - Best Management Practices
Volume 2 - Technical Pollution Prevention Guide
Volume 3 - Code of Practice

DOE FRAP 1996-02

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DISCLAIMER

This consultant's report was funded by Environment Canada under the Fraser River Action Plan through its Fraser Pollution Abatement Office. Funds were also provided by BC Auto Recyclers, the BC Ministry of Environment, Lands and Parks, the BC Ministry of Transportation, and the Insurance Corporation of BC. Environment Canada is not responsible for the content of this report but has made it available for public distribution.

Any comments regarding this report should be forwarded to:

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BEST MANAGEMENT PRACTICES

FOR
THE AUTO RECYCLING INDUSTRY
IN BRITISH COLUMBIA

(VOLUME I)

BY

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NOTICE

This project was funded by Environment Canada under the Fraser River Action Plan through its Fraser River Pollution Abatement Office. Funds were also provided by the Ministry of Environment, Lands and Parks (MOELP), B.C. Ministry of Transportation, and the Insurance Corporation of British Columbia.

The reports for this project consist of three volumes, including the Best Management Practices, Technical Pollution Prevention Guide, and Code of Practice for the Auto Recyclers.

The reports have been subjected to Environment Canada and MOELP's peer review, and has been approved for publication.

The documents are intended as advisory guidance to auto recyclers in British Columbia in developing approaches to pollution prevention. Compliance with occupational safety and health laws is the responsibility of each individual business, and is not the focus of these documents.

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EXECUTIVE SUMMARY

The objective of this project was to provide the auto recycling industry in British Columbia with a guide for pollution control. The resulting documents are presented in three volumes:

Volume I Best Management Practices
Volume II Technical Pollution Prevention Guide
Volume III Code of Practice for the Auto Recycling Industry in B.C.

Each volume is prepared as a stand-alone document. As a result, there is some repetition in each volume regarding the industry profile, waste management methods, and regulations.

Volume I, Best Management Practices, comprises four parts: a review of the current environmental management practices; technologies used in B.C. to recycle special wastes relating to the auto recycling industry; a list of licensed special waste transporters in B.C.; and the best management practices for the industry.

To review current environmental management practices and vehicle processing procedure, six auto recycling facilities located in the Lower Fraser Valley were assessed. Practices impacting on the environment were identified, and environmental training requirements for the operators were determined.

The second section reviews technologies available in B.C. for recycling special wastes from vehicles such as used oils, oil filters, antifreeze, and acid batteries. A list of companies which process these wastes is provided in Appendix I.

The third section presents environmental best management practices (BMPs) for auto recycling facilities. BMPs are designed to provide auto recyclers with an economically feasible approach to managing special wastes in the facility. The first part of Section 3 addresses the physical and structural design requirements for the auto recycling facility. The second part covers proper procedure to manage special waste.

Volume II, Technical Pollution Prevention Guide, provides auto recyclers with a step-by-step procedure to conduct an environmental site assessment, to check compliance with the BMPs, and to help the operator develop a pollution prevention plan.

This guide also includes the British Columbia Auto Recyclers' management policy statement, a profile of the auto recycling industry in B.C., waste management practices, environmental regulations, and employee training.

Volume III, the Code of Practice for the Auto Recyclers in British Columbia, comprises a brief review of the auto recycling industries in the province, the environmental regulations governing their operation, and the Code of Practice for the industry to conduct an

environmentally sound operation. The Code of Practice includes both facility design and operational requirements. It also provides the permitting agency with the requirements which may be incorporated into inspection procedures. The document could be used by MOELP for exempting auto recyclers from section 3 (1.1) and (1.2) of the Waste Management Act. This would lower ministry costs incurred through enforcement of the Waste Management Act.

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1.0 INTRODUCTION

Approximately 100,000 automobiles are taken off the road annually in British Columbia. Of these, roughly 30% have been involved in accidents and declared by the Insurance Corporation of British Columbia to be unrepairable, while others are aging vehicles that do not warrant further repair. The auto manufacturing industry is recognizing the need to recycle vehicle parts and body work, and there are numerous publications describing recent efforts to manufacture vehicles from readily recyclable materials. However, the automobile recycling and wrecking industry has been dismantling and reclaiming significant amounts of materials for the past 75 years. In British Columbia, there are 146 active automobile recycling facilities. Fifty-four of these facilities operate within the Fraser River Basin.

The dismantling of automobiles involves handling a significant quantity of hazardous materials, including: fuels, engine oil, oil filters, transmission fluids, antifreeze, brake fluids, air-conditioning refrigerants, mercury switches, power-steering fluids, shop rags, and lead-acid batteries. An almost complete disassembly of the vehicle may occur. Some parts are cleaned and stored for resale. Tires are either resold or sent to a tire recycler. The remaining parts (cores) may be sold to scrap metal recyclers, core suppliers, parts rebuilders, or crushed with the vehicle body and sold to steel recyclers.

Large areas are needed for the dismantling process and storage of vehicles and parts. Many of these properties have become contaminated with oils, acids, and heavy metals.

Special waste management regulations are becoming more stringent, and cleanup costs for contaminated sites are prohibitive. The British Columbia Auto Recyclers (B-CAR) recognize that for the vehicle recycling industry to flourish in the province, it is necessary to have environmentally sound procedures. B-CAR, therefore, initiated a study to develop Best Management Practices (BMPs), a Technical Pollution Prevention Guide, and a Code of Practice.

The resulting documents provide an operator's guide to protect the environment and to avoid liabilities arising from current business practices. As well, they can help government agencies evaluate the auto recycling operations with respect to their environmental impact. Federal, provincial, and municipal agencies will also be able to use the reports to implement environmental and safety standards for this industry.

2.0 CURRENT PRACTICE

The auto recycling industry in British Columbia was studied in order to evaluate current management practices and vehicle processing procedures; identify practices which might lead to adverse effects on the environment; identify issues important in developing the code of practice and the pollution prevention guide; and, clarify training needs.

2.1 Methodology

There are currently 146 automotive recyclers in British Columbia (B-CAR, pers.comm., 1994). Seventy-nine of them are members of B-CAR. Fifty-four sites are located in the Lower Fraser River Basin.

Representative samples of auto recycling facilities were selected to evaluate current management practices and a checklist was developed to detail issues to be addressed during the site visits.

2.1.1 Sample Selection

Six auto recycling facilities were selected for site visits based on the size of the operations: small, medium, and large. The sample sites comprised one large, two medium, and three small B-CAR member operations located adjacent to the Fraser River in the Lower Mainland. It was agreed that the individual sites would not be identified in the report.

The objectives of this survey were to evaluate the operational procedure for removal and disposal of special wastes, and the efficiency of the assigned operation areas for containment of spilled wastes and prevention of the contamination of surface, soil, groundwater, and stormwater runoff.

2.1.2 Development of a Checklist

Checklist development was key to the success of the survey and was prepared with input from the scientific authority of Environment Canada and B-CAR.

The checklist included:

- general information about the site (e.g., address, contact person, and age of the facility);
- description of site layout and location of stormwater and sanitary sewers;
- distance to local water body;
- production and turnover of recycled cars in the facility;
- activity areas, including vehicle holding area, dismantling area, parts cleaning, and storage area;

- special or hazardous waste management;
- spill prevention program;
- solid waste management;
- monitoring and safety programs;
- permit requirements; and,
- training of staff.

2.1.3 Site Visits

The property owners were informed that information obtained would be confidential, and would be used only for evaluating current practices in the industry.

Two-part site evaluations were completed in January 1995. Part one was an interview with the owner or manager for general information, such as location, age, and size of business, and types of licenses/permits. Also, owners were asked about handling each waste stream, location of wells on the property, disposal of municipal waste (septic tank or municipal sanitary sewer system), arrangement for stormwater discharges, and soil or water sampling by the facility.

Part two included a walking tour with the owner in order to observe the facility's operations, to assess specific waste management practices, and to visually determine the extent and location of visible soil contamination. The site visit concluded with a review of the completed evaluation form with the owner. Specific waste management practices evaluated included those for waste oil, transmission fluid, antifreeze, gasoline, cleaning solvents, and waste tires.

The following detailed factors were also reviewed:

- vehicle reception approach;
- vehicle dismantling;
- removal, storage, and disposal of waste liquids;
- parts cleaning processes, including the use, storage, and disposal of aqueous and non-aqueous cleaning liquids;
- procedure for handling parts inventory;
- parts and vehicle body storage;
- liquid waste discharges and associated monitoring;
- air emissions;
- sources and monitoring of special waste contamination to land, air, and water;

- safety and health requirements, including Workers' Compensation Board and fire safety regulations;
- emergency planning; and,
- staff training.

2.2 Evaluation of the Current Management Practices

Current practices of the six auto recycling facilities visited are described below. Each company had similar dismantling and recycling programs although minor differences in operation occurred at each facility.

2.2.1 Vehicle Reception

The sites obtain the majority of their vehicles from the Insurance Corporation of British Columbia (ICBC). ICBC provides a salvage invoice for these vehicles which indicates whether the vehicle can be repaired, or if it is designated for dismantling only.

On arrival at the recycling facility the vehicle may be:

- put into storage;
- taken to the dismantling area for a test run and then put into storage; or,
- taken to the dismantling area, tested, and immediately dismantled.

The method of handling the incoming vehicles depends on the rate at which the vehicles can be dismantled, and on the demand for parts from the received vehicle.

All vehicles are tested prior to dismantling. The tests determine the condition of the engine and other motorized parts; however, depending on the severity of the damage, front-end-collision vehicles may not be tested.

There is no set program to record the condition or the origin of the various parts. Some operators simply indicate with a chalk mark that the part is acceptable for reuse. Other operators may tag the part with information about the car model, year, and manufacturer.

In general, there is no set procedure for testing the received cars for leaks. The vehicle receiving area at most sites is not paved and there is no spill containment so contamination of the soils in the vehicle receiving area is inevitable.

2.2.2 Vehicle Dismantling

Dismantling area design and operational procedure varied from one facility to another. The dismantling area is where vehicles should be drained of fluids and other wastes. Tires,

batteries, and parts should be removed for resale or for their core value. A properly designed dismantling area will prevent wastes entering stormwater and soil, and will simplify and speed cleanup of spills that do occur. This area also serves as a central waste collection area, and ideally would be located close to storage areas for wastes and recyclable materials.

The extent of dismantling that occurs before long-term storage of the vehicle body varies greatly depending on types and models of vehicles handled by the facility. For example, for new model cars, the amount of steel scrap for recycling is extremely small. The vehicles may be cut up to provide replacement for quarter panels, fenders, wheel covers, etc., while only the damaged portion is scrapped.

Dismantling usually takes place on a special pad. However, some operations do not have specifically engineered dismantling pads. The pad at most operations is simply a cemented area, without special runoff containment. At some operations, the pad is just a gravel-surfaced area close to the facility building. Some operations, however, have made special efforts to control oils and other waste fluid by dismantling on a cement pad provided with some form of collection system for spilled liquids.

Sites where dismantling occurs in an unprotected gravel area are likely to have contaminated soils. The spilled fluids also have a high potential of contaminating ground and surface waters. A cemented area, without secondary containment, diverts the contamination potential from the underlying soils to soils adjacent to the pad. However, despite a change in location, the total potential for stormwater, surface water, and groundwater contamination remains unchanged.

Some cement dismantling pads were cracked. Spills could easily penetrate cracks and contaminate underlying soils. Inspection and proper maintenance of the dismantling area were lacking at most facilities visited.

One facility used a portable spill collection tray which could be placed beneath cars anywhere on the site. However, this option is not environmentally sound when it is raining.

During the dismantling procedure, the battery is usually removed first and transferred to the storage facility. Then the motor oil, antifreeze, transmission fluid, gasoline, and windshield-washing fluid are drained. However, some of the fluids may be left in the vehicle when it proceeds to crushing.

After the fluids have been drained, the engine is removed. The transmission, radiator, gas tank, motorized parts, lamps, doors, seats, exhaust systems, hoods and trunk lids, shocks, steering, and rear ends are also removed at this stage.

Again, some variation exists between operations. Some operations, especially those dealing with recent models, may completely strip all removable parts. Other operations

remove valuable parts and leave the balance on the hulk, which is then sent to long-term storage.

After the storage period, the vehicle is crushed for steel recycling. Some facilities have the vehicle crusher on-site. Others may haul the vehicles to a steel recycling facility without being crushed.

The dismantling pad is a major problem area in the auto recycling facilities visited. This is due to the use of a permeable dismantling pad (i.e., one which liquids can penetrate), a cracked concrete pad, or by permitting stormwater runoff to flow on the pad surface before discharge into a drainage ditch which flows directly into surface water.

2.2.3 Removal, Storage, and Disposal Procedures for Special Wastes

The wastes generated during the vehicle dismantling were divided into two groups: solid wastes and liquid wastes. The solid wastes included:

- batteries (lead and sulfuric acid) and lead parts;
- tires;
- mercury switches;
- oil filters;
- shop rags; and,
- airbag propellant (sodium azide).

Liquid wastes included:

- fuel (gasoline and diesel);
- used oils (motor oil, transmission fluid, general lubricants);
- antifreeze (ethylene glycol);
- brake fluids (glycols);
- power-steering fluid;
- parts-cleaning solvents (light hydrocarbons, e.g., Varsol, Naphtha);
- refrigerants (i.e,. for air conditioning); and,
- windshield-washing fluid.

2.2.3.1 Removal of Liquids

Liquid leaks or spills from vehicle parts represent the major contaminant threat from motor vehicle dismantling due to their high degree of mobility and difficulty in handling. In

the sites visited, management methods were often very similar, as liquids tended to be removed and stored in the same location.

Refrigerants are usually removed by a contractor before dismantling the vehicle. The other waste liquids and fuels are removed at most facilities during the dismantling process.

The fluid lines, which are cut for drainage, are either left open, simply twisted, or closed off with specially fitted plastic plugs. The latter practice is most desirable, as the potential for drips from residual fluids is greatly reduced. Lines left open lead to drips under the vehicle hulks in the hulk storage area.

Based on visual observations at nearly all of the recycling facilities evaluated, some spillage of used oil occurs at the vehicle receiving, dismantling, and hulk storage areas. However, the amount and extent of the resulting contamination are directly related to the management practices in each facility. Facilities which dismantle vehicles and drain fluids on a covered, impermeable surface, and which have a spill response plan, are less likely to have extensive soil contamination than a facility which dismantles and drains directly on the soil, and has limited spill control.

2.2.3.2 Waste Management Practices for Recovered Fluids

i) Fuels

Fuels, including gasoline and diesel, are a valuable commodity to the facility. Usually the fuel is drained into 5-gallon containers and/or directly transferred to motor-operated equipment. All sites indicated that there was no problem with reusing the gasoline. Incoming vehicles usually do not have full tanks, and all gasoline was either used on-site for company vehicles (forklifts) or for staff vehicles.

Fuel spills are believed to be fairly common and are usually due to the way in which the fuel is removed. When the fuel tank is removed, fuel is often then manually poured into other containers. Spillage is likely with this draining method. If an air- or hand-driven pump is used, the potential for spills would be greatly reduced.

ii) Used Oil and Oil Filters

Used oil includes motor oil, transmission oil, power-steering fluid, and differential fluids.

The motor and transmission oils are drained into a plastic container and transferred to storage vessels.

Most of the facilities evaluated do not remove and drain oil filters from vehicle engines. These undrained oil filters are either crushed with the vehicle or removed with the engine and sent to scrap metal dealers. The filters usually contain residual waste oil which is eventually vaporized by the vehicle hulk shredder at a metals recycler, or ends up in the vehicle fluff after the hulk is shredded.

Oil filters may be a substantial source of oil release into the environment, and it is therefore strongly recommended to remove oil filters from vehicles during the dismantling and draining procedure.

iii) Antifreeze

Antifreeze is drained from the vehicles; however, it was reported that vehicles with front-end damage may have radiator leaks, and in most cases, the antifreeze has already completely leaked from the vehicle before it arrives on-site. The recovered antifreeze is stored on-site and is either given away, reused at the facility, or disposed of as a special waste.

iv) Windshield-Washing Fluid

Windshield-washing fluid is also drained during the dismantling process. This fluid is stored on-site and is either used there or given away.

v) Refrigerants

Air-conditioning refrigerant (R12) has been identified as an ozone-depleting chemical, and its production and use in new equipment is being phased out. It remains in use in older vehicles, however, and must be managed properly.

The Waste Management Act prohibits individuals from knowingly venting ozone-depleting compounds into the atmosphere while maintaining, servicing, repairing, or disposing of air-conditioning or refrigeration equipment (Waste Management Act: Ozone-Depleting Substances).

Facilities are required by law to remove refrigerants from motor vehicle air-conditioning systems using equipment that meets standards set by the Canadian Environmental Protection Act (CEPA).

Before dismantling and/or crushing vehicles, all facilities have air-conditioning refrigerant removed by a licensed contractor.

vi) Brake fluid

Brake fluid is usually left in the vehicle, although the master cylinder may be removed intact, full of brake fluid, and sealed before storage. The brake fluid connections to the master cylinder are sealed before storage. In this manner, the viable parts are maintained in a working condition.

The fluid pipes, which are cut for drainage, are either left open, simply twisted, or closed off with specially fitted plastic plugs.

Most facilities store the master cylinder without secondary containment. In case of a leak, the fluid may contaminate the soil, groundwater, or stormwater runoff.

2.2.3.3 Removal of Solid Wastes

i) Batteries

Batteries are removed during the dismantling process. Depending on the quality, batteries are either stored for resale or recycling.

ii) Tires

Tires represent a sizable waste stream, as well as a significant resource. The evaluation showed that most facilities remove tires from vehicles before they are crushed. They are then put in the appropriate waste stream and are disposed of properly.

None of the sites visited had large numbers of tires stored. It was reported that a good proportion of tires were sold. Old or damaged tires are disposed of by a disposal agent who picks them up.

iii) Mercury Switches

Mercury is a persistent environmental contaminant that is toxic to plants and animals and can accumulate in the food chain. Mercury switches are installed under the hoods or in trunks of some vehicles. Mercury from the switches may be released into the environment when the vehicle is crushed or when the crushed hulk is shredded at a metal recycling facility.

Only one facility was aware of the presence of mercury switches. At that facility, switches were removed either for resale or mercury recovery. The switches were kept in sealed containers.

iv) Airbags

Airbags have usually been deployed when the vehicle is received. However, about one in five cars have good airbags. Some facilities have trained personnel remove the reusable airbags for resale.

2.2.3.4 Special Waste Storage

Based on the quantity, the Special Waste Regulation requires permits and manifests for the storage and transportation of waste, respectively. All facilities handle small amounts of special waste and, as a result are exempt from storage permit requirements. However, manifests are required for shipments of special waste in excess of a specified amount (section 46 of the Special Waste Regulation). Most of the facilities inspected did not keep copies of the manifests for special waste shipments.

i) Liquids

Liquid wastes such as oil and antifreeze are not stored properly at most sites. Some facilities use old fuel storage tanks; some use drums up to 200 litres in size. Most operators store their tanks outside, without secondary containment or protection against inclement weather or vehicular damage. A vehicle collision could easily result in a spill to the surrounding environment. Only one site had a central liquid storage facility with secondary containment around the storage tanks.

Some of the sites visited kept storage tanks outdoors without proper seals. At one facility, openings were simply covered with a rubber sheet. Other facilities used storage tanks with small, funnel-fitted openings. This may permit rainwater to accumulate in the tanks.

Oil filters are commonly placed in the hulk prior to crushing. It is preferable to drain oil filters before disposal in order to recover the oil for recycling.

Parts-cleaning solvents are provided by a contractor who collects the spent solvents for recycling. This maximizes solvent efficiency while ensuring safe recycling and disposal.

The presence of mercury switches installed under the hoods or in the trunks of cars was not known by most facilities. Only one facility removed and placed them in sealed containers for resale, or to be processed by a mercury recovery contractor.

At most sites there was inadequate labeling, including substance identification and risk statements (flammable, hazardous, toxic, etc.).

The quantity of waste liquids stored varies extensively from site to site. Usually no inventory of stored materials is maintained.

ii) Solids

The quality of on-site battery storage is variable. Covered storage in appropriate containers is required, but is not provided at some operations, although others store scrap batteries properly in an impervious plastic container. Proper storage is important to prevent leaking batteries from corroding metal, concrete, or other surfaces and eventually contaminating soil and groundwater. Batteries are collected on-site and resold or disposed of by contractor.

Asbestos brake linings, common in older car models, usually do not undergo special treatment. They either stay with the hulk, or with the suspension if it is removed for sale.

2.2.4 Parts Handling: Cleaning, Storage, and Disposal of Cleaning Agents

The parts removed during dismantling undergo different procedures, depending on the operation. Usually, valuable, high demand parts are removed, cleaned and then stored. Parts in low demand or of low value are left in the car, and are either removed upon request from a client, or crushed with the hulk. Cores are disposed of with the hulk or are sold to a metal recycler or core buyer.

2.2.4.1 Parts-Cleaning Processes

Several cleaning systems are used, including solvent-based cleaning, steam cleaning, or high-pressure water cleaning. The solvent-based cleaning system consists of a 120-litre tank and a recirculation pump which allows the part to be cleaned with a stream of solvent. The systems are commercially serviced on a contract basis by a special waste management company. The contractor replaces the spent solvent, disposes of the sludges, and reclaims the contaminated solvent. Liquid used for the degreasing are light hydrocarbons, such as Varsol or Virsol, which are chlorine-free. Material Data Safety Sheets (MSDS) for these solvents were not available at most facilities; however, it is required by the Workplace Hazardous Materials Information System (WHMIS).

Potential losses of hydrocarbon solvent and solubilized oils may occur at the parts washer unit. These may be in the form of splashes during the cleaning operation, or drips during transport of the part to the storage area. Since these spills are on a concrete pad, wash-off occurs during cleanup or rain storms. The repeated occurrence of small spills can lead to significant contamination of the surrounding soils near the operation. None of the sites visited provided secondary containment for the parts-cleaning units.

Following preliminary cleaning in the parts washer, some parts are washed down with a pressure washer unit. Some operations clean all reclaimed parts before they are moved into the storage area, whereas others only clean the parts required by a customer. Engines for resale are generally washed using the pressure water system. The water from this process may go to a simple oil-water separator, or directly into the soil. For operations where vehicles are repaired for resale, the vehicle may be washed down using detergent solutions. Although the water volumes may be small for most of these processes, repeated actions over several years results in contamination of the soils in some localized areas.

Some facilities wash the parts on the dismantling pad or in an unpaved area close to the dismantling pad. This contaminates soil, groundwater, and receiving surface water. To minimize contaminated discharges from the facility, parts should only be cleaned when required, and catchment for the contaminated washing waters should be provided. The wastewater should be recycled or treated before being discharged into the environment.

One site had an engineered water collection system around the dismantling pad. Water contaminated with oils and hydrocarbons was directed to a simple oil-water separator designed similar to an American Petroleum Institute (API) Separator. The accumulated oil retained by the separator was removed from time to time by means of a shop vac. The aqueous fraction of the collected liquid was discharged to a storm drain. However, the roof drains also discharged onto the dismantling pad where oils would likely be carried by stormwater runoff during rainstorms. The API separators can remove small amounts of oil and grease. However, excessive amounts of residual oil and gasoline cannot be removed in this manner especially if these waters are emulsified.

2.2.4.2 Parts and Hulk Storage

Parts removed from the vehicles are stored in three different ways:

- in a totally enclosed building on shelves and racks;
- in a partly covered storage area on open racks; or,
- in the open on a pervious floor.

i) Enclosed Storage

Parts which have high value or are prone to rapid deterioration if exposed to inclement weather are stored in the main building or completely under cover. These parts include: good engines, transmissions, power-operated parts, electrical components, mirrors, stereos, radios, seats, and batteries.

Most sites had innovative approaches to parts storage. The main building usually provides the largest portion of covered storage space. Other covered storage is provided by sheds, tents, old mobile trailers, buses, vans, and even pickup canopies. None of the sites visited provided spill containment for parts containing fluid as required by the Waste Management Act.

ii) Rack Storage

Additional storage of engines, transmissions, wheels, tires, springs, rear ends, shocks, doors, quarter panels, and gas tanks is provided in racks that are either in the open, or are in only partly covered areas. Where residual oil has been on these parts, there is significant evidence of contamination of the soils or gravel beneath the racks.

Gasoline tanks at one facility were sealed with rubber sheeting from old tire inner tubes to prevent water entering the tank during storage. The gasoline tanks were then stored in racks without cover.

iii) Open Storage

Vehicle hulk storage occupies a major proportion of the sites. The hulks may have been stripped of the most valuable parts but may still have lights, seats, mirrors, fenders, trims, brake parts, and steering mechanisms. These parts may be removed upon request of a client.

Open storage is also provided for gasoline tanks, doors, axles, rear ends, shocks, springs, and exhaust systems.

As with the rack storage, open storage leads to residual oils leaking onto the ground. Where batteries are stored in the open, there is a potential for sulfuric acid leaks. At all sites visited, oil stains on the soil surface were noticed.

2.2.5 Stormwater Runoff and Waste Liquid Discharges

Stormwater quality from the auto recycling facility depends on the waste management practices followed. All of the facilities evaluated had visible areas of soil contamination. Stormwater percolates into the soil, or flows from each site into the ditches or storm sewers which run around the site perimeter. Stormwater discharges from these facilities may be contaminated with used oil, antifreeze, and fuel.

The buildings at one facility had a designed and engineered roof drainage which discharged into the sewer system. At another site, roof drainage spilled into the oily wastewater collection system; another spilled over stored vehicle parts. In both of the latter scenarios, road dirt and oils were washed into the surface soil or into the stormwater runoff.

Waste liquid discharges on the sites originate either from the washroom facilities, or from the oily wastewater produced by pressure wash-down of vehicles or vehicle parts. In some facilities, the oily wastewater is discharged directly into the storm sewers, or is allowed to percolate directly into the ground. At other facilities, there has been some effort to minimize the discharge of free oil into the storm sewers by using oil-water separators. However, characteristics of effluent from these water separators are not available to confirm the degree of oil removal. It is likely that these wastewaters contain emulsified oils, low concentrations of benzene, toluene, ethyl benzene, xylene (BTEX), heavy metals and antifreeze.

Discharges from washroom facilities either go into a sanitary sewer or discharge into a septic tank and drain field system.

2.2.6 Air Emissions

Several areas on-site have the potential for air emissions. These emissions may occur at the dismantling pad, the fluid-draining area, liquid storage tanks, the gasoline storage tank, the parts-cleaning unit, and during refrigerant removal from air-conditioning units.

The practice of sealing gasoline tanks for storage, carried out at one of the facilities, reduces the potential for hydrocarbon emissions.

2.2.7 Record Keeping

Record keeping at each facility was assessed during the site visits. On most sites records are kept of the vehicle arriving on the site, and all parts removed from a vehicle are carefully listed in an inventory system. However, there are no records for special wastes generated on the sites.

2.2.8 Training

Worker training differs between operations. Some facilities do not provide any safety training and do not have any Material Data Safety Sheets. Others report having workers training in the Workplace Hazardous Material Information System (WHMIS), a safety committee, and Material Data Safety Sheets on-site.

Some sites provide training for emergencies and have qualified first aid personnel, but most of the training provided pertains to vehicle dismantling. Some sites have emergency spill kits, but no specific instruction appears to have been given to most staff regarding the proper use of these kits, and spill kits are not placed where a spill might occur. Personnel should be trained on how to control a spill when it occurs at various potential areas of the site.

2.3 Environmental Problems

2.3.1 Sources of Special Waste Contamination

The potential for contamination of soils with waste liquids may occur during fluid draining, dismantling, parts cleaning, transfer of the collected liquid wastes to storage, and in the storage area. Some operators dismantle vehicles on a concrete pad which has some form of collection system for spilled fluids. Others use simple portable spill collection trays. Some facilities carry out the dismantling on unpaved areas where the fluids may either drain directly into the ground, or may be washed off the pad into surface soils surrounding the dismantling area. Some concrete dismantling pads were cracked, allowing fluids to percolate into the soil beneath the pad.

Some sites direct the contaminated wastewater from high-pressure washing devices and contaminated surface runoff from the dismantling area to an API oil-water separator. The separated oil is collected, and the water which may contain emulsified oils is discharged into the storm sewer system.

A listing of potential environmental problem sources is presented in Table 1.

2.3.2 Contaminated Soils

All sites inspected in the study showed significant areas of soil contaminated with oils. Visual inspection indicated that many of these areas may contain oil concentrations above special waste C levels required in the "Criteria for Managing Contaminated Soils in British Columbia." However, no samples were taken to determine the degree of contamination in these areas. Contamination has been caused by:

- leaks from cars in the receiving area;
- spills of oils and other fluids from the vehicle during dismantling;
- cracks in the concrete dismantling pads;
- dismantling on unprotected soil;
- inadequate size of concrete pads;
- failure to collect runoff from concrete pads or blacktop areas;
- pressure washing of vehicles and parts without treatment of generated wastewater;
- storage of parts with residual oil exposed to inclement weather; and,
- storage of hulks without sealing oil and other fluid lines.

The age of the facility may be an indicator of potential impact on the environment through years of cumulative spills or releases of wastes. Even though the management practices for some types of wastes have changed over the years, what is now considered improper may have been common practice in the past. For example, land disposal or dumping of fluids or other wastes was common. In addition, the nature of motor vehicles and other wastes has changed over the years. More toxic types of products were used in the past, such as cooling fluids in transformers or lubricants containing polychlorinated biphenyls (PCBs) which were phased out in the late 1970s.

Table 1: Potential Environmental Problem Sources

Area of Operation	Potential Problem
Receiving area	• Leaks of oils, gasoline, and antifreeze during temporary storage.
Dismantling pad	• Spills and leaks of fluids during fluid draining and dismantling. • Stormwater runoff from pad to surrounding soils. • Percolation of contaminants to ground through cracks in the concrete pad. • Increased runoff at uncovered dismantling pad. • Lack of spill containment and spill control equipment.
Parts-cleaning unit	• Spills and splashes during cleaning and rinsing. • Drips of oils and solvent during parts transfer. • Lack of secondary containment. • Lack of spill control equipment. • Air emissions.
Pressure-cleaning unit	• Pressure wash water containing oils are lost to surrounding soils and stormwater drains. • Lack of equipment for oil removal from contaminated water.
Liquid storage	• No secondary containment or lack of spill control. • Potential loss to soil. • Air emissions from improperly sealed containers.
Parts storage	• Residual oils from parts stored without cover drip into soil or are washed off part surfaces during rain storms. • Lack of secondary containment for oil-containing parts.
Core storage	• Residual oils from cores stored without cover drip into soil or are washed off core surfaces during rain storms.
Hulk storage	• Oil drips from unsealed oil lines and greasy parts and engine. • Leachate from contaminated soils.
Battery storage	• Acid and lead loss to soil possible from batteries stored in improper containers.
Crushing area	• Drippage of oil from parts that are not completely drained. • Crushing on an unpaved area without a drip-pan under the crusher. • Lack of spill control equipment.

3.0 TECHNOLOGIES FOR RECYCLING FLUIDS FROM MOTOR VEHICLES

This section provides a review of existing technologies, both mobile and stationary, to recycle various fluids recovered from motor vehicles, including oils, refrigerants, antifreeze, and acid batteries. A list of companies currently operating in BC which recycle these fluids is provided in Appendix I; a list of licensed transporters is provided in Appendix II.

3.1 Oil Recycling

Millions of litres of used lubricating oil (engine oil, transmission fluid, and gear oil) disappear into the Canadian environment each year. Used oil, however, can be re-refined and blended for use as a lubricant.

The used oil may be recycled, used as a fuel, used in pavement manufacture, or exported to other jurisdictions, providing all statutes in those jurisdictions are met. To prevent used oil from reaching municipal landfills, the Canadian Petroleum Products Industries (CPPI), the MOELP, and local retailers of lubricating oil have started a program to collect and recycle used oil. As of September, 1992, all vendors of lubricating oil in British Columbia are required to accept customers' used oil for recycling at no cost to the customer. The oil vendors can either have a collection depot on-site, or contract a local depot to accept used oil.

There are four major used oil service companies in British Columbia, including Mohawk Lubricants Ltd., Laidlaw Environmental Services Ltd., Opcon Pacific Recycling Ltd., and Imperial Paving Ltd. (Appendix I). Together, these companies/facilities have the potential to process 49,321 tonnes annually.

- **Stationary Oil Recycling Processes**

The Mohawk plant, which is located in North Vancouver, provides an environmentally viable alternative for the recycling of used lubricating oil. Through their base oil extraction process, Mohawk Lubricants is capable of producing high quality base oil from used feedstocks.

The used oil feedstock is collected in carefully segregated storage systems. The company's trucks provide year-round pick-up service in the province. All used oil must be tested upon arrival at the plant for flash point, PCB's, synthetic oils, water content, and bunker oil. Once approved, the used oil becomes a feedstock and is ready for processing. The distillation process begins with the dehydration of the used oil. The remaining used oil is distilled to remove lighter hydrocarbons, which produce a fuel by-product that is sold or used as a thermal energy source to operate the plant. The remaining portion is further distilled to separate other fractions, such as light oil (known as 10 weight or 150 distillate), and heavy oil (known as 30 weight or 450 distillate). The distillation residue is a reusable product in the asphalt industry for road paving and roofing. The light and heavy oil distillation fractions are then hydro-treated at high

temperature and pressure with hydrogen gas in the presence of a catalyst bed. This process removes nitrogen, sulphur, chlorine, and oxygenated organic components, and results in a high quality base oil. The products are then blended, packaged, and sold as a variety of different lubricants, or sold to other companies which produce blended lubricating oils.

- **Mobile Oil Recycling Processes**

Opcon Pacific Recycling Ltd and Imperial Paving Ltd. provide on-site oil reprocessing. The mobile processing unit is moved to the client's site and recycles industrial lubricating oils for reuse by the same customer. Opcon processes 100 tonnes annually with a design capacity to process 500 tonnes per year.

Opcon's oil reprocessing consists of three stages: water removal, suspended solid removal, and addition of base oils to restore lubricant viscosity. In the first stage, the removal of water and light ends from the oil is accomplished by a simple decanting and coalescing phase, by circulating emulsified oil through a ceramic media. This creates large droplets of water, thus permitting rapid settling in a decanting tank. Once the free water is recovered, the oil passes on to a vacuum distillation system, which is used to remove remaining traces of water. The second stage of the treatment process is the removal of suspended solids by filtration. The third stage is the addition of base oils to restore the lubricant viscosity. Waste generated from the process is disposed of by the customer using a special waste service company.

3.2 Oil Filters

Most of the waste oil filters in British Columbia came from the 2.4 million registered vehicles, which produce approximately 6,000,000 used oil filters annually (MOELP, 1993). These filters contain about 870 tonnes of used oil and 2,750 tonnes of scrap metal (El-Rayes Environmental Corp. 1992. *Special Waste Management Capabilities in B.C.* Prepared for B.C. Ministry of Environment, Lands and Parks). Five companies (Canadian Oil Filter Recovery Corp., Filtercor Recovery Inc., Prestige Recycling Ltd., Superior Glycleaners Environmental Ltd., and Superior Filter Recycling Inc.) recycle used oil filters (Appendix I).

Most recycling companies use similar methods to treat the used oil filters. The rubber gasket from each filter is removed manually, and then each filter is crushed and the oil extracted. The rubber and scrap metal are shipped to recycling plants while the used oil is sent to a special waste re-refining plant (Mohawk).

Only Canadian Oil Filter Recovery Corp. has an incinerator where oil filters are incinerated after crushing. The other companies send the crushed filters to a steel recycling company. Crushing reduces the oil content in the filters from 30% to between 8-17%. The advantage of crushing the filter before incineration is that part of the oil is recovered for re-refining.

3.3 Antifreeze

As a special waste, used antifreeze must be recycled or disposed of properly. Currently, there are two main antifreeze recyclers in British Columbia: Superior Glycleaners Environmental Ltd., Vancouver; and Advanced Coolant Technologies Inc. (ACT), Richmond. Both companies operate in the Lower Mainland and on Vancouver Island, and both have mobile units providing their services to auto shops, or to companies with large fleets.

Several processes have recently been applied to antifreeze reclamation, including filtration, distillation, and ion exchange processes.

In the filtration process, chemical packages designed to precipitate dissolved metals and raise the pH are added to the used antifreeze. The antifreeze is then filtered to remove the precipitate, scale, and gel. The chemical packages typically contain corrosion-inhibition and anti-foaming agents, dispersants, and cavitation and deposit-control agents.

Distillation is another means of recycling used antifreeze. The distillation process separates the coolant ingredients by vaporizing the ethylene glycol and condensing it back into a pure glycol liquid. The recovered ethylene glycol is reusable as antifreeze after addition of corrosion inhibitors, anti-foaming agents, and dispersants.

Ion exchange is also used to remove various contaminants. In this process the coolant is first filtered to remove any suspended solids, then flows into the ion exchange unit where dissolved solids are removed. This unit consists of a column containing cation exchange resins, followed by a column containing anion exchange resins. The purified coolant can then be returned to service.

Advanced Coolant Technologies Inc. (ACT), located in Richmond, B.C., operates a coolant recycling system that uses filtration and ion exchange to remove contaminants.

The company uses two types of equipment. The first type is a portable, closed-loop unit called the BG Cool'r Clean'r^{R} Coolant Purification System. This unit is attached directly to a vehicle's cooling system. Used coolant is taken directly from the engine, recycled on the spot, and pumped back into the engine for reuse with no loss of volume. Due to this closed-loop system, all of the cooling system is flushed and purified with none of the antifreeze drained from the system.

The second type is a mobile unit which can process the antifreeze in bulk. Used coolant is filtered to remove larger particulates, suspended solids, and organic compounds. The coolant then flows directly into the cation exchange tank where it flows evenly upward and comes into contact with the ion-exchange resin. Here all anions are replaced by hydroxide (OH^-) ions. The purified liquid then flows into an activated carbon filter, which removes any entrained gases from the liquid. The result is a completely purified ethylene glycol/water solution which, after adding anti-corrosive conditioners, can be reused.

3.4 Batteries

Metalex Products Ltd. in Richmond, and K-C Recycling Ltd. in Trail are the only two processors, or breakers, of batteries operating at present in the province. They have a total processing capacity of 59,000 tonnes of batteries annually. These facilities break the batteries and separate them into their lead-bearing, plastic, and acid components.

In the typical operation at K-C Recycling, batteries are crushed and shredded in a hammer mill and fed into a flotation cell. The various components of the batteries which leave the flotation cell are treated and recovered in a coarse lead recovery process, a fine lead recovery process, and a plastics recovery process. Coarse lead settles to the bottom of the flotation cell. The fine lead and acid solution from the coarse lead process are pumped to the fine lead agitation tank. There the plastic is separated from the fine lead, dewatered, and pelletized. The fine lead is recovered in a cyclone, then sent to a vacuum filter for further dewatering. Dried fine lead from the vacuum filter is finally transferred to the lead storage tanks.

The acid solution recovered from the cyclone is returned to the fine lead agitation tank for make up solution. Acid solution filtrate recovered from the fine lead vacuum filter is then pumped to a series of waste acid storage tanks prior to being transferred to Cominco Ltd., also located in Trail. The waste acid is used by Cominco for the manufacture of fertilizers.

The battery recycling operation does not involve any effluent discharge. The recovered acid and wash water are collected and used by Cominco Ltd. in the manufacture of fertilizers, while the recovered plastic is pelletized and sold for manufacturing plastic products.

4.0 BEST MANAGEMENT PRACTICES

4.1 Introduction

Dismantling motor vehicles involves handling a significant amount of hazardous materials including fuels, motor oil, oil filters, transmission fluids, antifreeze, brake fluids, refrigerant, mercury switches, power-steering fluids, shop rags, and lead-acid batteries. And, during parts cleaning, special waste may be generated. The potential benefits for a company by properly handling fluids removed from vehicles and by minimizing the wastes generated by parts cleaning include the reduction of:

- waste treatment and disposal costs;
- future regulatory compliance costs;
- future cleanup costs;
- risk of liability to the site owner or the owner of neighbouring properties; and,
- risk to workers, the local community, and the environment.

There are also the tangible benefits of improved company image, business efficiency, and profitability.

The objective of this chapter is to provide auto recyclers with information on the best management practices (BMPs) to protect the environment and to comply with the special waste management regulations. Best Management Practices (BMPs) are the approved practices; maintenance procedures; and other physical, structural, and/or managerial practices to prevent the contamination of the environment.

BMPs emphasize methods to control, at the source, all wastes generated at the facility for the protection of the environment. They include reduction of air emissions, wastewater discharges, and separation of special wastes so there will be no need to treat stormwater runoff.

In this manual, BMPs are divided into two sections. The first section addresses the physical and structural design of the site. The second discusses operational procedures used at auto recycling facilities.

4.2 Physical and Structural Design

Sources of pollution in a vehicle recycling facility may include:

- receiving area;
- dismantling pad;
- parts-cleaning unit;

- pressure-cleaning unit;
- liquid storage;
- parts storage; and,
- hulk storage.

To prevent pollution of the environment, the following design details should be considered.

4.2.1 Site Layout

Site layout is a key element to smooth flow of an operation and can improve efficiency, productivity, and profitability. In addition, it can decrease the potential for site contamination. The site layout should include:

- vehicle receiving and holding area;
- dismantling area;
- parts cleaning;
- inventory flow;
- parts storage;
- core storage;
- fuel storage;
- special waste storage;
- crushing area;
- sales area;
- shipping and receiving; and,
- office location.

A good site layout will provide the most practical path for the incoming vehicles from the time they enter the holding area, to the time the parts, cores, and hulks leave the property.

4.2.2 Vehicle Receiving Area

This is defined as the area where an incoming vehicle could be temporarily stored prior to the dismantling of any mechanical or body part, or transfer to the hulk storage.

It is preferable to have this area paved (concrete, asphalt, etc.), and provided with a spill containment (bermed) area and spill control equipment as described in Section 4.3.1.4.

4.2.3 Dismantling Area

This is where work is done on vehicle parts which contain fluids that may leak and contaminate the soil and/or the stormwater runoff. Processing may involve draining fluids from a single leaking part, and removing part or all of the fluid-containing parts.

The dismantling area must be designed to retain all fluids that may be spilled so that they cannot pollute stormwater, surface water, or groundwater. The secondary spill containment area must be able to hold either 110% of the largest volume of liquid waste in any given container, or 25% of the total volume of liquid waste in the bermed area, whichever is greater. The dismantling pad must be enclosed in a building, or contained under a roof, and be designed so that runoff from surrounding areas cannot flow onto the pad.

The dismantling pad may be made of concrete, asphalt or other impervious material. However, experience with cement and asphalt dismantling pads have shown some drawbacks especially if not well designed, since they may be subject to cracking or absorption of liquid wastes.

In existing facilities, it may be expensive to construct a pad since analysis of soil for contaminants, and soil cleanup (if contaminated), will probably be required. Consequently, a portable steel pad fitted with secondary containment could be more economical.

Some containment options to prevent contaminating stormwater runoff or surrounding soils include:

- Having the dismantling pad in an enclosed building. The pad must be impervious and spill containment must be provided, as previously described.
- The dismantling can also be an impervious, bermed pad under a roof. Spill containment must be provided, as above. The roof must be of sufficient size to prevent snow or rainfall from reaching the pad. Also, the pad must be high enough to prevent surface runoff from surrounding areas from flooding onto the pad.

Fuel should be drained on this pad, and the methods used must meet the Fire Department regulations in the municipality.

4.2.4 Parts-Cleaning System

Parts-cleaning systems include manual removal of heavy grease and oil to reduce cleaning time, solvent-based parts cleaning systems, and pressure washing and steam cleaners.

i) Solvent-Based Cleaning System

The solvent-based cleaning system and solvent containers must be placed on an impervious floor with bermed secondary containment and spill control equipment, as required by the Waste Management Act.

ii) Pressure Washing and Steam Cleaners

For a pressure washing or steam cleaning system, a zero-discharge recycling system (i.e., no waste water is released; it is completely recycled) is the best method for wastewater management. Facilities that do not have an on-site recycling system should make every effort to install this type of system.

Using a wastewater treatment system with disposal to the municipal sewer is acceptable as long as permit requirements for wastewater discharges to the sewers are met. However, it is not economical to have such a system for the following reasons:

- Restrictions on oil concentration in the wastewater discharges may not be met by currently available equipment.
- Future regulations will become more stringent, and this will require upgrading the treatment system.
- The facility will be subject to costly wastewater sampling and analysis.
- Additional cost for discharge of wastewater to the sewer system may apply.

Wastewater generated from on-site treatment systems must be tested to determine if it is a special waste. If so, it must be disposed of according to provincial special waste disposal requirements.

The recycling systems which are typically used with high-pressure washers prevent special wastes from entering the sewer system or contaminating soil or stormwater runoff.

4.2.5 Fluid Storage Area

This is the area(s) where solvents and other liquid chemicals, liquid wastes, and/or fluids from vehicles are stored prior to use, resale, recycling, treatment, or disposal. The storage area must be designed according to the Workers' Compensation Board, the municipal fire department regulations, and the Waste Management Act. For the fluid storage area, the following must be considered:

- Avoid using underground storage tanks because, in the case of leaks, the remediation costs could be prohibitive.
- Store containers inside a building on a bermed, impermeable surface as required by the Waste Management Act, to prevent loss of fluids in case of a spill.
- If inside storage is not available, a roof is acceptable, provided it is large enough to prevent rain and snow from reaching the spill containment area.
- A tarp is not acceptable as a permanent cover.
- Label each container as to its contents.
- Use secondary containment or double-walled tanks for storage of large quantities. Double-walled tanks do not need spill containment if they are anchored.
- At the perimeter of the fluid storage tank(s), install dikes or other physical barriers of sufficient height to contain the greater of 25% of the total enclosed tank volume, or 110% of the volume contained in the largest tank. However, it may be less expensive to store fluids in several 205-litre containers than in one large container, since the required secondary containment will be smaller.
- Store fuels in a separate area, as required by the municipal fire department regulations.

4.2.6 Hulk Storage Area

This is generally an outdoor soil or gravel area, where vehicles in various stages of dismantling are stored. This area is suitable for the storage of cars if the operational BMPs are in place, i.e., all fluids, batteries, and mercury switches in the vehicle are removed prior to storage, with the exception of sealed units such as drop-out rear ends, shock absorbers, and bumper shocks.

4.2.7 Vehicle Crusher Area

This mechanical device crushes vehicles to reduce the volume of material transported to a scrap metal yard. It can be either portable or stationary. If the vehicle is drained of fluids prior to crushing, there is no potential for contamination; however, the use of a crusher with a built-in fluid collection system is recommended. Alternatively, the crusher should use drip-pans, and any liquids in the drip-pans must be disposed of properly.

4.2.8 Storage Areas of Core and Parts Containing Fluids

The storage area must be installed on an impervious containment pad under a roof which is large enough to prevent rain and snow from reaching the secondary containment area.

The core and parts containing fluids may be stored in leak-proof containers or on a covered and curbed, impermeable surface with spill containment and spill controls, including drip-pans and absorbents. Collected fluids must be disposed of as special wastes.

4.2.9 Storage of Parts for Sale

These parts must be stored in a building or under a roof which is large enough to prevent rain or snow from reaching the spill containment area. The building must have no floor drainage to the outside. The floor must be made of an impervious, chemically-resistant surface with an inward slope, dike, or other physical barrier to provide a spill containment in case of a leak from a stored part. The containment must be capable of holding 25% of the total volume of fluids in the stored parts.

4.3 Operational Best Management Practices (BMPs)

Operational BMPs apply to all areas of activity, including vehicle dismantling, fluid storage (including fuels), hulk storage, vehicle crusher area, parts/core piles of oil-contaminated components, and storage of parts for sale.

The operational BMPs are divided into two parts. The first discusses the basic requirements; the second discusses detailed, specific activities during the dismantling process.

4.3.1 Basic Requirements for Operational BMPs

The basic requirements for the Best Management Practices include:

- providing employee training;
- assigning a pollution prevention team;
- practicing good housekeeping, preventative maintenance, spill prevention, and spill control; and,
- site inspection and record keeping.

4.3.1.1 Employee Training

i) Certification Training Program

British Columbia Auto Recyclers division will be administering a certification training program for auto recycling operators. At least one employee per yard must attend the environmental training program. Training includes:

- waste management regulations;
- health and safety regulations (WCB/WHMIS);
- the Fire Code;
- spill control planning;
- handling practices for special wastes; and,

- hazards of special wastes handled in the facility.

ii) In-House Training:

The facility must conduct an in-house training program for all dismantlers and yard personnel at least once a year. The following topics must be presented:

- updated Pollution Prevention Plan for the facility;
- spill response and reporting procedures;
- good housekeeping and preventative maintenance BMPs;
- environmentally acceptable material handling practices, particularly those related to vehicle fluids (including fuels); and,
- Material Safety Data for hazardous materials handled in the facility.

4.3.1.2 Pollution Prevention Team

The facility must identify one or more individuals responsible for developing and implementing a pollution prevention plan as detailed in the Pollution Prevention Guide.

The duties of the pollution prevention team are to:

- hold regular meetings to review the overall operational BMPs, and the results of the facility inspections;
- assign responsibilities for inspections, operational and maintenance BMPs, availability in emergency situations, and record keeping;
- train yard employees in the operation, maintenance and inspection BMPs and reporting procedures; and,
- identify local MOELP or Environment Canada contacts.

4.3.1.3 Good Housekeeping — Preventative Maintenance

Operational BMPs must consist of ongoing housekeeping and maintenance functions at the facility. Together, these efforts can dramatically reduce the possibility of spills and environmental impact. Regular housekeeping and preventative maintenance should include:

- immediate cleanup of fluid, fuel leaks, and spills on any soil or paved area. Soil can be cleaned up by removal, disposal, or treatment;
- removal and proper disposal of debris and sludge from all treatment systems, such as settling/detention basins and oil-water separators, monthly, or more often, depending on the quantity of oil captured;

- prompt repair or replacment of all substantially cracked or damaged paved containment areas;
- prevent the direct discharge of liquid pollutants to stormwater, groundwater, or surface waters;
- transfer of fluids from the vehicles and parts to storage tanks or containers either on an impervious contained area, or over drip-pans;
- constructing impervious areas that are chemically resistant to gasoline, diesel, crankcase oil, transmission fluid, and all other fluids that could be spilled or leaked onto the containment areas;
- emptying drip-pans immediately after fluids are collected;
- replacing drain plugs, and plugging any openings that could leak fluids;
- draining oil and fuel filters before disposal;
- recycling empty oil and fuel filters. Discarding rags and other oily solid waste into appropriately closed and properly labeled containers;
- using and regularly checking dumpsters, garbage cans, drums, or other containers that are durable, corrosion resistant, non-absorbent, non-leaking, and that have a solid cover, for disposal of contaminated solid wastes;
- using and regularly checking containers, piping, tubing, pumps, fittings, and valves that are adequate for the fluid and the intended use;
- posting signs at fluid removal and storage areas clearly indicating the material contained in each tank;
- minimizing the use of toxic solvents and other toxic chemicals;
- using only water for dust control; and,
- developing a maintenance plan for all facility equipment, such as forklifts and hydraulic lifts, to ensure that the equipment does not leak.

4.3.1.4 Spill Prevention/Spill Control

In addition to good housekeeping and preventative maintenance BMPs, spill prevention and spill control are the key to an environmentally sound operation. Spills are the most likely cause of environmental damage to occur at vehicle recycling facilities. They can happen during drainage, dismantling, or through improper storage and management of fluids and other special wastes.

When a spill occurs and exceeds the quantity specified in the Special Waste Regulations, the spill must be reported immediately to the MOELP. This would include oil or gasoline spills of more than 100 litres, or antifreeze or brake fluid spills of 5 litres or more (section 10, Waste Management Act).

Spill prevention and control prevents waste fluids from contaminating the surrounding soil, air, and groundwater or stormwater runoff. The following section outlines spill prevention and cleanup practices that must be included in a facility's pollution prevention plan.

i) Spill Control Equipment

Spill control equipment which must be available and easily accessible throughout the facility includes:

- safety equipment for employees, including gloves and safety glasses;
- absorbent material for soaking up oils and solvents: rags, towels, pads, booms and organic absorbents, such as lime (for battery acid) and sawdust;
- containers to hold spilled waste such as drip-pans, pails, and drums;
- shovels and scoops to pick up organic cleanup materials; and,
- industrial spill cleanup products sold specifically for absorbing oil and solvents.

Spill cleanup kits are available through a number of manufacturers. Some auto recyclers devise their own kits at a fraction of the cost, for example, recyclable rags and towels plus a mop and container. Whether you buy a kit or make your own, make sure cleanup equipment is easily accessible throughout the facility.

ii) Spill Prevention

To prevent spills from occurring, the following procedure should be followed:

- Confine inspection, draining, and dismantling of vehicles to the dismantling pad.
- Drain vehicles, parts, and cores as soon as possible after vehicles enter the facility.
- Deposit collected fluids in proper storage containers.
- Clean up small spills right away. Any fluids spilled during dismantling should be cleaned up by mopping or using the smallest amount of absorbent possible. Dispose of used absorbents properly.
- Store parts and cores with proper spill containment. Drained vehicles may be stored outside without the need for secondary containment.
- Place all fluids in properly labeled storage containers immediately after draining. Do not leave open pails or containers where they can be knocked over or forgotten.
- Place a platform or step next to storage drums so employees do not have to lift drain pans above their waists to pour fluids into containers. Pouring fluids from awkward positions increases the risk of spills.

- Keeping funnels at waist height or lower makes pouring easier. Use over-sized funnels to reduce risk of spills or spashes.
- Store all waste fluids in closed containers to prevent spills. Check levels before adding any liquid to prevent overflows. Also, storage containers must be closed tightly so that hazardous fluids do not evaporate.
- Store all used absorbents in closed, covered, leak-proof containers. Used absorbents must be handled as a special waste, or reused by cleaning them at an industrial laundry facility.
- Inspect storage containers regularly for leaks.
- Do not stack barrels or other waste-fluid containers.
- Do not store leaking vehicles. Always drain them as soon as possible. If leaking vehicles cannot be drained immediately, place drip-pans under leaks. The best storage method is on a curbed, impermeable surface with spill controls, such as pads, booms and absorbents.

iii) Spill Control

If a spill occurs, the following steps will reduce the impact of the spill on the environment:

- Clean up spills right away.
- It is best to use drip-pans, reusable booms, pails, and washable absorbent materials such as oil mops, pads, and towels for cleanup.
- Keep spill control equipment and absorbent material in each area where there is a potential for fluid spills.
- Make sure that all employees can reach the spill containment kit quickly and easily.
- Train all employees to respond quickly to different kinds of spills.

4.3.1.5 Inspection

The pollution prevention team must conduct visual inspections monthly as follows:

- Visual inspection for discoloration of soil in vehicle storage, dismantling, and fluid storage areas. During the rainy season, inspect visually for floating materials, turbidity, sheen, and odor in the stormwater discharges.
- Verify that the BMPs are being used and are adequate.
- Instruct employees to continually watch for spills or releases during their normal work activities.

4.3.1.6 Record Keeping

Retain the following reports:

- Visual Inspection Reports
    - Scope of the inspection.
    - The personnel conducting the inspection.
    - The date(s) of the inspection(s).
    - Actions taken to correct inadequacies in the BMPs.

- Reports on spills of oil or hazardous substances in amounts greater than Reportable Quantities, according to the Waste Management Act.

- Copies of waste disposal manifests.

4.3.2 Detailed Operational Best Management Practices (BMPs)

Several areas in a facility could be sources of pollutants. These include the vehicle receiving area, dismantling and storage, as well as parts cleaning, vehicle crushing, and special waste handling. Generally, using methods to prevent pollution at its source will protect the soil and groundwater, and prevent contamination of stormwater runoff.

This section includes operational BMPs at various areas in the facility which can be a potential source of pollutants (Table 1).

4.3.2.1 Inspecting Incoming Vehicles

Proper inspection of the incoming vehicles is important, particularly when a vehicle is going to be stored rather than dismantled. The following vehicle inspection procedures will help reduce environmental pollution by spill prevention:

- Inspect incoming vehicles for leaks from engines, radiators, transmissions, fuel tanks, and damaged areas.
- Place drip-pans under leaks to collect fluids for proper recycling or disposal until vehicles can be drained.
- Do not store leaking vehicles; drain them.
- Hold leaking vehicles on a curbed, impermeable surface with spill containment and spill controls, such as pads, booms and absorbents.
- Do not dismantle fluid-containing components in the holding area. Parts that do not contain fluids, such as fenders, hood, and seats, may be removed in the holding area.
- Remove the fuel, fuel tank, battery, and refrigerant as soon as possible.
- Drain all fluids from vehicles before storing.

4.3.2.2 Vehicle Draining, Dismantling, and Storage

Spills are most likely to occur while dismantling, draining, or storing vehicles, parts, and cores. Proper procedures help prevent fluids seeping into groundwater, stormwater runoff or air-conditioning refrigerant escaping into the air.

Proper draining and dismantling methods include:

- Dismantling and draining should be done at the dismantling area, an impervious pad with spill containment.
- Parts that do not contain fluids (such as fenders, hoods, and seats) and sealed units (drop-out rear ends, shock absorbers, and bumper shocks) may be removed outside the process area.
- Drain vehicles following testing.
- Drain engine, transmission, radiator hoses, fuel tanks, window-washing fluid tanks, air-conditioning units, radiators, and differential units.
- Keep drip-pans under vehicles while unclipping hoses, unscrewing filters, and removing parts. Use a height-adjustable drip-pan when draining the vehicles. Keep the drip-pan close to the fluid stream to reduce spills, splashes and overflows.
- Replace plugs when draining is completed. Cut and crimp metal lines and plug all rubber hoses after draining. Store-bought plugs, small balls and golf tees work well to plug rubber hoses.
- Pour waste fluids into properly labeled containers immediately after draining.

The following section describes procedures for dismantling various vehicle parts:

i) Engines

- Drain oil from engines. Remove and drain oil filters. Replug the engine to prevent oil from leaking out of vents during storage.
- Engines which will be resold may be removed with the oil remaining, in order to protect parts. The engine should be properly plugged and stored within a proper containment area. Before the engine leaves the facility, oil must be removed from it and from the oil filter.
- To prevent leaks, replace the drain plug after draining. If you punch the oil pan to drain it, plug the hole after draining. Use plugs that fit properly and would prevent any leaks. Self-drilling and self-tapping screws are recommended for drilling drain holes, because they can easily be used to replug holes.
- Drain engines on a hoist or draining stand. Place drip-pans below vehicles to collect waste fluids, or use a funnel to drain fluids directly into storage containers.
- Store engines in a properly designed storage area.

- Do not pile scrap engines, or crush vehicles until fluids have been removed.

ii) Transmissions

Transmission fluid is difficult to remove and spills are very common. Extra care should be taken to properly drain transmissions so that spills do not occur.

For environmentally safe handling of transmission fluids:

- Drain all transmissions before crushing.
- Drain transmissions by removing the plug, the oil pan, or by drilling a hole in the pan. Replace the pan after draining, and seal all holes. Self-drilling or self-tapping screws work well for drilling drain holes, as they can easily be used to replug holes.
- Drain transmissions on a draining rack, over a drip-pan, or use a funnel to drain fluids directly into a storage container.
- Leave dipsticks in transmissions, or replace the dipstick with a proper plug to prevent oil leakage. Tighten all bolts on the oil pan to prevent leaking of any fluid left in the transmission.
- Leave drive-shaft yokes or a proper plug on transmissions to prevent leaks.
- The facility may have the option of draining the fluid at the dismantling pad, or of properly plugging the parts in order to prevent leakage, and storing with proper containment. At time of sale, the transmission and torque converter must be drained before leaving the premises.
- Remove and drain torque converters when removing transmissions. Torque converters are difficult to drain because of their round shape. They should be tipped at different angles to remove as much fluid as possible. Plug torque converter to prevent leaks.
- After draining, seal all fluid lines to prevent leakage. Metal lines can be crimped or bent; rubber hoses can be plugged with clamps, balls, or golf tees.
- Store transmission fluid with other used oils.
- Store removed transmissions on a curbed, impermeable surface with spill controls, including drip-pans and absorbents.

iii) Differentials

- Drain differential fluid on all rear-wheel drive vehicles that have inspection covers or drain plugs. There are approximately one to two quarts of differential fluid that should be stored and recycled with used oils.
- Differentials removed for reuse in their existing condition do not need their oil drained.
- Differentials must be sealed or plugged, and stored under a roof within a secondary containment area.

iv) Radiators

Antifreeze is likely to spill from radiators during drainage, dismantling, and parts storage. To avoid contamination of soil and stormwater runoff, the following procedures should be used:

- Drain antifreeze from radiators as soon as possible after vehicles enter the facility.
- Store antifreeze in labeled drum for recycling or disposal.
- Undo hoses or cut with a side cutter, and plug the ends after draining.
- Place drip-pans under radiators while draining.
- Store radiators in a leak-proof container, or on a covered surface with secondary containment.
- Recycle used radiators regularly.
- Do not leave radiators in vehicles to be crushed.

v) Fuel Tanks

Fuel tanks are a potential hazard for soil and air contamination, and can easily become a fire hazard.

- Drain fuel tanks as soon as possible.
- Store waste fuel and reusable fuel in closed storage containers which are clearly labeled and provided with secondary containment.
- Store used tanks in piles in a well ventilated area on a covered and curbed impermeable surface with spill controls, including drip-pans and spill control equipment.
- Do not store undrained fuel tanks, as they are a fire hazard.

vi) Airbags

Airbags (whether made of plastic, vinyl, or metal) contain a propellant called sodium azide which is a hazardous substance. Sodium azide is dangerous if inhaled, and may burn

exposed skin. Undeployed airbags can also damage vehicle shredders by releasing sodium azide into the processing equipment and ultimately into the auto fluff.

- Leave deployed (used) airbags in vehicles as they do not present a human or environmental risk.
- Remove all undeployed airbag units when vehicles enter the facility. When removing airbags, the operator should wear appropriate protective clothing, goggles, mask, etc.
- Store undeployed airbags indoors until they can be resold.

4.3.2.3 Parts Cleaning

It is important to keep hazardous wastes such as used oil, antifreeze, and solvents segregated from wastewater. Because of the potential for wastes and wastewater to pollute soil and groundwater, environmental laws regarding disposal are very strict. The following section lists parts-cleaning procedures to protect the environment and minimize waste generation:

- Clean parts only when necessary.
- Do not clean parts without proper wastewater management system in place.
- Do not mix cleaning solutions or solvents with other fluids.
- Do not pour or spill cleaning solutions or solvents on the ground or down sanitary sewers, storm sewers, or septic drains.
- Do not store cleaning fluids in open or uncovered storage containers.
- Do not leave solvent-soaked rags on the ground.
- Do not store solvents directly on asphalt surfaces. Cover asphalt surfaces with heavy polypropylene plastic with a minimum thickness of 10 mils. (Solvents can cause asphalt to disintegrate.)

i) Scraping

- Remove caked-on grease and oil from parts with a scraper or knife before washing, in order to reduce cleaning time and water usage (wire brushes are commonly used to clean parts, but tend to clog easily). Dispose of oil, grease, and sludge as a special waste.

ii) Solvent-Based Parts Washing

A solvent-based washing system is an efficient way to clean parts, because the solvent is reused and recycled. To prevent pollution of the facility by the solvent used for parts cleaning, follow these procedures:

- Drain parts before removing them from the parts washer. This allows excess solvent to run off into the washer, and not onto the ground.

- Keep parts washers closed or covered when not in use, to reduce the evaporation of solvents.
- Label solvent storage containers as required by the Workers' Compensation Board regulations.
- Record filling start date on all waste solvent containers.
- Keep cleaning-solvent storage containers closed when not in use.
- Keep solvent-soaked rags in a covered container for reuse if possible.
- Recycle cleaning solvents by a certified solvent recycler.

iii) Carburetors

- Clean carburetors only when necessary. Some carburetor-cleaning solutions are caustic, but most are solvent-based. Carburetors are usually cleaned and rebuilt before they can be used in another vehicle. Since most recycling facilities do not rebuild carburetors due to cost, customers typically clean and rebuild them.
- Clean carburetors in solvent-based parts washers rather than carburetor-cleaning-solution dip tanks, whenever possible. This will get the part clean enough, and will not leave caustic solution in the carburetor's moving parts. Caustic carburetor-cleaning solutions usually contain methylene chloride, which is a highly toxic, volatile material. Also, the caustic solution is corrosive, and could remain in the part and damage the metal.

4.3.2.4 Vehicle Crushing

Salvage facilities use a variety of methods to crush vehicles. Regardless of the method, facilities need to prevent waste fluid spills during crushing, whether it is done by facility employee, or by a contracted crusher.

4.3.3 Fluid Handling

4.3.3.1 Used Oils

It is important that used oils be collected, stored, and disposed of properly. Used oils include, but are not limited to, the following petroleum-based fluids:

- motor oil;
- transmission fluid;
- differential oil;
- power-steering fluid; and,
- transaxle fluid.

Used oils must be disposed of as a special waste.

- Drain and collect all oils on a covered and curbed impermeable surface with spill controls including drip-pans and absorbents.
- Used oils can be mixed together and stored in the same container.
- Store used oil in leak-proof, closed containers, such as drums or above-ground storage tanks placed on a curbed, covered, impermeable surface with spill controls.
- Label all used-oil storage containers ‘used oils’.
- Regularly check all used-oil storage containers for leaks and fluid levels.
- Report any spills of oil exceeding 100 litres to MOELP.
- Used oil can be removed from the facility by a licensed used-oil hauler. Haul used oil on a regular basis to avoid accumulating more than your spill containment area can handle. If the facility, within a 30-day period, generates or stores more than 5,000 litres of used oil, it should make a Generator Registration Report and apply for a Consignor Identification Number. A manifest is required to transport more than 205 litres (45 gallons).
- The volume stored cannot exceed 50,000 litres, otherwise the facility has to be registered as a Temporary Storage Facility.
- Do not store oil in open or leaking containers.
- Do not store oil in dented or corroding barrels; they are unstable and at risk for leaks and spills. Waste containers must be placed in a secondary containment system.
- Do not leave funnels in oil storage drums or tanks.
- Do not mix antifreeze, solvents, gasoline, cleaning solvent, paint, or anything else with the used oil.

4.3.3.2 Antifreeze

The active ingredient in antifreeze is ethylene glycol or propylene glycol. Used antifreeze may contain traces of fuel, oil, and metal particles (including lead). If not properly managed and stored, these pollutants can seep into soil and groundwater, harming people, plants, animals, and the environment.

- Drain antifreeze from radiators as soon as possible after vehicles enter the facility.
- Determine if the antifreeze is reusable or a waste fluid. Reusable antifreeze can be used in facility vehicles. Waste antifreeze is contaminated or too old to be reused. It is considered a special waste and must be disposed of according to the Special Waste Regulations.
- Label storage containers according to antifreeze type: “Waste Antifreeze - Special Waste” or “Reusable Antifreeze.”

- Use over-sized funnels to transfer antifreeze and other waste fluids to storage containers.
- Recycle non-reusable antifreeze by distillation, ion exchange, filtration, or use an approved antifreeze recycling service.
- Do not leave funnels in storage drums or tanks.
- Do not mix antifreeze with other fluids.

4.3.3.3 Fuel

Used and waste fuel are not only a pollution risk but also a safety risk to facility employees. Handling, storing, and disposing of fuel requires special care to prevent spills, explosions, and fires.

- Drain fuel and remove fuel tanks as soon as possible after vehicles enter the facility.
- Determine whether the fuel is reusable, or if it is waste due to contamination with water or other wastes, or is too old to be reused.
- Store reusable fuel for use in facility or employee vehicles, or siphon fuel directly from dismantled vehicles into facility vehicles using an air- or hand-driven pump.
- Store fuels in a covered area with secondary containment.
- Label waste fuel storage containers “Waste Fuel - Special Waste”.
- Store diesel fuel separate from gasoline.
- Keep storage containers closed, and remove funnels when not in use.
- Do not store undrained fuel tanks.
- Do not mix fuel with other fluid.
- Inspect storage containers weekly in order to ensure the tank is not full.
- Recycle waste fuel with a licensed special waste management company.
- Follow all special waste transport and disposal requirements when disposing of waste fuel.

4.3.3.4 Refrigerants

Refrigerants used in air-conditioning units contribute to ozone depletion of our atmosphere and evaporate easily during air-conditioning unit servicing or dismantling. Vehicle recycling facilities are required by the Waste Management Act (Ozone-Depleting Substances Regulation) to recover all refrigerant from vehicles that enter their facilities.

- Check air-conditioning units and remove refrigerant from all incoming vehicles using approved recovery equipment. Because a pressure gauge allows refrigerant to escape into the environment, assume that the units contain refrigerant and then remove it.

- Store refrigerant in a tank that meets the Underwriters Laboratory of Canada or compatible standards.
- Sell refrigerant only to certified reclaiming facilities, or to refrigerant collectors.
- Perform air-conditioning repair work only if it is done by a certified motor vehicle air-conditioning technician. Use approved recycling equipment, and reuse refrigerant only in automobile air-conditioning units owned by your facility.
- Do not do anything that will release refrigerant into the air, such as cutting lines, disconnecting hoses, or flattening vehicles before removing refrigerant.
- Do not overfill refrigerant storage tanks. Storage tanks should be filled to a maximum of 60% of the gross weight rating listed on the tank, or 80% of the tank's rated volume at 21^{o} C.
- Do not release refrigerant from storage tanks.

4.3.3.5 Windshield-Washing Fluid

Although windshield-washing fluid is mainly alcohol, water, and detergent, it contains small amounts of antifreeze, and it may mix with other wastes if not properly drained, stored, and recycled.

- Drain windshield-washing fluid from vehicles as soon as possible after they enter the facility.
- Reuse windshield-washing fluid in the facility or employee vehicles.
- Sell or give away reclaimed windshield-washing fluid to customers.
- Store windshield-washing fluid in covered containers on a covered, curbed, impermeable surface with spill controls.
- Do not mix windshield-washing fluid with other liquids.

4.3.4 Solid Waste Handling

Solid wastes include oil filters, batteries, lead parts, mercury switches, and waste tires.

4.3.4.1 Used Oil Filters

Undrained, used oil filters are a potential source of pollution. This section outlines environmentally safe procedures for handling used oil filters.

- Drain engine oil and remove used oil filters from vehicles as soon as possible after vehicles enter the facility.
- Drain oil filters of all free-flowing oil by punching holes in the top of the filter, and draining it with the filter threads facing up. This method bypasses the check valves in

the filter, ensuring that most of the oil is removed. Oil filters should be drained for 12 to 24 hours.

- Do not drain used oil filters on unprotected ground.
- Store drained used oil filters in a closed, leak-proof storage container, or on a curbed, impermeable surface with spill controls.
- Recycle used oil filters only after they have been drained. These filters may be transported to a scrap metal recycling facility or put inside vehicles that are being transported to a scrap recycling facility.
- Transport used oil filters in a leak-proof container to ensure that leftover oil is not dumped or dripped on nthe ground.
- Do not leave oil filters on engines sold for reuse, as cores, or recycled at a scrap metal dealer.

4.3.4.2 Lead-Acid Batteries

Used lead-acid batteries pose pollution risks and special handling problems at vehicle recycling facilities. Improperly managed and stored batteries are a safety hazard. Cracked batteries can pollute the environment, particularly when stored outdoors. The best practices for battery handling are outlined below.

- Test batteries to determine usability or resale quality. Do not drain fluids from batteries.
- Remove all batteries. Also, remove lead cable ends from reusable batteries and store the lead parts in a covered container that is strong enough to hold the excessive weight of lead.
- Leave battery cable ends on batteries that cannot be resold. This saves time during dismantling and also assures that cable ends are recycled.
- Place cracked or leaking batteries immediately in a closed, leak-proof storage container, or on a covered, curbed, impermeable, acid-resistant surface with spill controls including drip-pans and lime.
- Store batteries indoors in either a closed, leak-proof container, or on a curbed, covered impermeable surface with spill controls.
- Store batteries on a non-reactive surface. This kind of surface may include the following:

    1) Fiberglass or plastic boxes made specifically for battery storage. These can be purchased from local suppliers, or supplied by core battery buyers.

    2) A curbed, impermeable asphalt surface coated with acid-resistant epoxy.

3) A covered wooden frame lined with heavy polypropylene plastic. Polypropylene is the least expensive plastic available; however, any heavy sheet plastic may be used.

4) A curbed, concrete surface coated with acid-resistant epoxy, fiberglass or plastic, or lined with heavy polypropylene plastic.

5) Polypropylene cement-mixing tubs. These tubs, usually sold at lumber yards, are rectangular (2' x 3') and can hold approximately 30 batteries.

- Sealed five-gallon polypropylene plastic pails can be used to temporarily store leaking or cracked batteries.
- Store batteries in an upright position to prevent leaks from vent holes.
- Stack batteries no more than five high. If batteries are stacked higher, they may become unstable. Some facilities use wooden planks between each layer of batteries to provide stability, and to prevent terminal posts from puncturing the battery above.
- Spread an absorbent, such as lime or baking soda, in the bottom of battery boxes or battery storage bins to absorb spilled battery acid. Manage all spilled materials and absorbents as a special waste.
- Inspect all batteries, storage containers and cover materials weekly for leaks, cracks or tears, and record inspection results. Storage containers or materials that have been exposed to freezing temperatures should be checked more often.
- Do not over-fill storage containers. Batteries on the bottom may be crushed, and the storage containers may become difficult to move.
- A permit is needed to store more than 10,000 kg of battery waste (approximately 500 batteries). A Consignor Identification Number (BCG No.) is required to temporarily store (less than 14 days) more than 2,000 kg (100 batteries).
- Do not accumulate batteries for a long period of time - recycle regularly.
- Keep records to show that your facility is recycling used batteries.
- Transport batteries for recycling either by a used-battery hauler, or with the facility’s own trucks.
- A manifest obtainable from the MOELP regional office is required to haul more than 1,000 kg (50 batteries).
- Do not store batteries in vehicles, as they can corrode and leak more easily.

4.3.4.3 Lead Parts

Lead is well-known as a toxic substance and potential pollutant. The phasing-out of leaded gasoline has reduced the levels of lead in the air and soil. Lead parts, such as battery cable

ends and tire weights, are often a source of lead pollution. To prevent lead contamination at auto recycling facilities, the following practices should be followed:

- Remove lead tire weights and battery cable ends before crushing vehicles. Battery cable ends may be left on unusable batteries and recycled along with the batteries.
- Store lead parts in a covered container that is capable of handling the excessive weight of lead. Store lead tire weights with batteries in battery boxes and make sure weights are not placed under batteries or allowed to roll around in the box. This makes the stacks unstable and increases the possibility of puncturing the batteries.
- Recycle lead parts with a metal or battery recycler.
- Do not leave lead parts in vehicles. Make sure that lead parts are removed before crushing.
- Do not store lead parts on the ground or in uncovered containers.
- Do not store lead parts for long periods in moist atmospheres. They can corrode to a white powder or dust, which will contaminate the storage area.

4.3.4.4 Mercury Switches

Mercury, a highly toxic metal, is often found in under-hood or trunk light switches. These light switches can be found in vehicles built in the 1970s and 1980s as well as in brand new cars. Liquid mercury and mercury vapor are hazardous to both humans and the environment. To be safe, remove all light switches in the hood or trunk before the vehicle is crushed.

- Remove all mercury switches from vehicles as soon as possible after they enter the facility, and check that they have been removed before crushing.
- Be careful not to break or puncture the mercury container during removal.
- If mercury is spilled at the facility, carefully collect it and place it in a plastic container. Carefully seal the container and label it “recovered mercury.” Use a mercury spill kit to complete the cleanup.
- Store mercury switches in a leak-proof, closed container. The mercury in the switch is enclosed in a glass capsule. The most important storage precaution is to store mercury switches in a way that prevents the capsule from breaking.
- Recycle mercury switches with a licensed metal recycler that reclaims mercury.
- Do not store mercury switches on the bare ground or in uncovered containers.

4.3.4.5 Waste Tires

Waste tires present a potential for fires. Although waste tires do not ignite easily, once on fire they burn at a high temperature, and they are difficult to extinguish. Extinguishing

methods are costly and can produce an oily runoff that can pollute soil and nearby surface and groundwater.

- Store small quantities of waste tires. Transport them regularly to a permitted waste-tire processor.

4.4 Summary

By following the procedures detailed in this document, auto recyclers will be able to run their businesses in an environmentally sound manner. Implementing BMPs will also enhance business performance by reducing potential liabilities, increasing operational safety and improving public image.

GLOSSARY

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Consignee*: A receiver of special waste (sole ownership, partnership or a corporation).

Consignor*: A company which has special wastes to be transported to a special waste management facility.

Consignor Identification Number (BCG No.)*: A unique number issued to waste consignors by the Environmental Protection Program and without which, waste quantities greater than a specified amount may not be consigned (transported).

Contingency Plan*: A document which provides an organized course of action to be followed to prevent pollution incidents, and to limit potential pollution in case of fire, explosion, or discharge of hazardous waste which could threaten human health and the environment.

Cores: Scrap vehicle parts that have value to a parts manufacturer (i.e., a rebuildable part).

Crusher Facility: a mechanical device which reduces the volume of vehicle hulks prior to transportation to a scrap metal yard. It can be either mobile or stationary.

Dismantling Area: The area where fluid drainage, testing, and dismantling of a vehicle is done. Processing may involve testing of the engine and other parts, draining of fluid, and removal of parts.

Disposal*: The introduction of waste into the environment through any discharge, deposit, emission, or release to any land, water, or air by means of facilities designated, constructed, and operated so as to minimize the effect on the environment.

Facility*: Any works that are designed to, or do handle, store, treat, destroy, or dispose of special waste.

Fluff: Waste that is not removed at vehicle salvage yards becomes “fluff” once processed by a vehicle shredder. Components of fluff include: plastics, glass, undrained fluids, rubber, carpet, dirt, seat foam, etc.

Fluid Storage Area*: The area(s) where solvents and other liquid chemicals, liquid wastes, and/or fluids from vehicles are stored prior to use, resale, recycling, treatment, or disposal.

Groundwater*: Water below the ground surface at the level where the soil is saturated with water.

Heavy Metal*: Any of the following elements: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, or zinc.

Hulk Storage Area: An outdoor area on a pervious surface (liquids can drain or seep through it), such as soil or rock, where vehicles in various stages of dismantling are stored.

Hydrocarbon-contaminated Soil*: Soil, sand, gravel, rock, or similar material which is contaminated with a petroleum product including, but not limited to, gasoline, diesel, fuel oil, hydraulic oil, and lubricating oil.

Impervious*: A material having a permeability not greater than .0000001 cm/second when subjected to a head of 0.305 m of water. That is, liquids essentially cannot drain through it.

Incompatible Special Waste*: A special waste which, when in contact with another special waste or substance, and under normal conditions of storage or transportation, may react to produce heat, a gas, a corrosive substance, or a toxic substance.

Indoor*: Enclosed and protected from precipitation and wind, as in a building, but does not include a shipping container used for passive storage.

Leachate*: Any liquid, including suspended materials which it contains, which has percolated through or drained from a special waste facility.

Long-term Storage*: The permanent holding of special waste in an above-ground indoor facility.

Manifest*: A form specified by the Special Waste Regulation to document and track the movement of special waste shipments.

Mobile Facility*: Any movable or transportable facility that is designed, constructed, and operated to treat or destroy special waste.

Owner*: The person who owns a facility or a part of a facility, and includes an operator who is authorized by the owner to act as his agent.

Part: Vehicle part that can be resold or rebuilt.

Parts-Cleaning Systems: Any system for the removal of heavy grease and oil to reduce cleaning time. System can include manual cleaning, solvent-based systems, and pressure washing and steam cleaners.

Recycle*: To wholly utilize special waste or residue from a special waste management facility in an agricultural, commercial, manufacturing, or industrial process or operation, where the principal purpose of the process or operation is not waste management. Also, such use by promptly packaging it for retail sale to meet a market demand, or by offering it for retail sale to meet a market demand.

Refrigerants*: Fluid, such as R12 or R134a, used in vehicle air-conditioning systems.

Scrap Part*: Vehicle part that is sorted by metal type and sent to a scrap recycler to be baled and melted down.

Short-term Storage*: The storage of special waste for more than 336 hours (14 days) at which time the special waste is removed for storage, treatment, or disposal elsewhere.

Special Waste*: Dangerous goods that are no longer used for their original purpose, including those that are recycled, treated or disposed of; intended for recycling, treatment, or disposal; or in storage or transit before recycling, treatment, or disposal. Some examples are waste oil, waste asbestos, leachable toxic wastes, wastes containing polycyclic hydrocarbon, wastes containing tetrachloroethylene, etc.

Storm Sewer*: A man-made drain, ditch, or sewer used primarily to carry natural precipitation runoff.

Tank*: A stationary device constructed of non-earthen materials such as wood, concrete, steel, or plastic, which provides containment, and is designed for the short-term storage of special waste.

Temporary Storage*: The storage of special waste for less than 336 hours (14 days) and includes, but is not limited to, the collection, packaging, handling, bulking, or holding of special waste prior to shipment, management at a facility, or while on its way to a destination.

Treatment*: The handling or processing of special waste in such a manner as to change the physical, chemical, or biological character or composition of the special waste in order to eliminate or reduce the volume, or one or more hazardous properties of the special waste.

Used Oils*: Includes, but is not limited to: motor oil, transmission fluid, differential oil, power-steering fluid, and transaxle fluid.

Vehicle Receiving Area: The area where a wrecked or used vehicle could be temporarily stored prior to the dismantling of any mechanical or body part, or transfer to the hulk storage.

Vehicle Crusher Area: The area where the crusher is located.

Washout*: The movement of special waste from any facility as a result of flooding.

Waste*: Includes air contaminants, litter, effluent (waste water), refuse, special wastes, and any other substances designated by the Lieutenant Governor-in-Council whether or not it has any commercial value or is capable of being used for a useful purpose.

Waste Fluids*: Includes, but is not limited to: used oils, antifreeze, brake fluid, and windshield-washing fluid.

Waste Management Act*: Refers to the British Columbia Waste Management Act.

Waste Oil*: Automotive lubricating oil, cutting oil, fuel oil, gear oil, hydraulic oil, any other refined petroleum-based oil, synthetic oil, or materials containing 3% or more of such oils, where the oils through use, storage, or handling have become unsuitable for their original purpose due to the presence of impurities or loss of original properties.

*as defined by Special Waste Regulations.

APPENDIX I

LIST OF WASTE LIQUID RECYCLERS IN B.C.

APPENDIX II

LIST OF LICENSED SPECIAL WASTE TRANSPORTERS IN B.C.

Company	Location
OIL	
Mohawk Lubricants Ltd.	North Vancouver
Laidlaw Environmental Services Ltd.	Delta
Opcon Pacific Recycling Ltd.	Surrey
Imperial Paving Ltd.	Matsqui
Oil filters	
Canadian Oil Filter Recovery Corp.	Kelowna
Filtercor Recovery Inc.	Burnaby
Prestige Recycling Ltd	New Westminster
Superior Filter Recycling Inc.	Penticton
Superior Glycleaners Environmental Ltd.	Vancouver
Refrigerant - Freon	
See Yellow Pages under Air Conditioning or Automobile Air Conditioning	province-wide
Antifreeze	
Superior Glycleaners Environmental Ltd.	Vancouver
Advanced Coolant Technologies Inc. (ACT)	Richmond
Nor-est Radiators Ltd.	North Vancouver
Batteries	
Metalex Products Ltd.	Richmond
K-C Recycling	Trail

Appendix II:

Special Waste Transporters

Special waste	Company name	Address	Phone #
All wastes	Bandstra Transportation Systems Ltd	PO Box 95, Smithers, B.C., V0J 2N0	(604) 270-4440
All wastes	Berry & Smith Trucking Ltd	301 Warren Ave E, Penticton, BC, V2A 3M1	(604) 492-4042
All wastes	Filtercor Recovery Inc	1590 Booth Ave, Coquitlam, BC, V3K 1B7	(604) 540-4111
All wastes	X.S. Transport & Co Ltd	9097 Upper Prairie Rd, Chilliwack, BC, V2P 6H4	(604) 794-3340
All, except biomed & PCB	Triangle Transportation & Warehousing	6013 Thorne Ave, Burnaby, BC, V3N 2T8	(604) 522-6055
All, except biomedical	Advantage Waste Specialties Inc.	#123-13694 104 Ave, Surrey, B.C., V3T 1W4	(604) 585-2717
All, except biomedical	Atomic Transportation Systems Inc.	2070 Logan Ave, Winnipeg, MB, R3C 2X6	(204) 633-9320
All, except biomedical	Ceda-Reactor Ltd	1590 Booth Ave, Coquitlam, BC, V3K 1B7	(604) 540-4100
All, except biomedical	Economy Carriers Ltd	4086 Ogden Rd SE, Calgary, AB, T2G 4P7	(403) 264-1140
All, except biomedical	Hazmat Transportation Services Ltd	4086 Ogden Rd SE, Calgary, AB, T2G 4P7	(403) 264-1140
All, except biomedical	International Chemical Express Inc	19563-96 Ave, Surrey, BC, V4N 4C5	(604) 888-6666
All, except biomedical	J.B. Hunt Special Commodities, Inc	615 J.B. Hunt Corporate Dr, Lowell, AR, 72745	(501) 820-0000
All, except biomedical	Laidlaw Environmental Services Ltd	7783 Progress Way, Delta, BC, V4G 1A3	(604) 940-0894
All, except biomedical	Laidlaw Environmental Services Ltd	PO Box 390, Ryley, AB, T0B 4A0	(403) 663-3828
All, except biomedical	Master Wash Products Ltd	7783 Progress Way, Delta, BC, V4G 1A3	(604) 940-0894
All, except biomedical	Northwest Enviroservice, Inc	PO Box 24443, Seattle, WA, 98124	(206) 622-1090

Special Waste Transporters (Cont.)

All, except biomedical	Triwaste Cleancare Inc	9185 Rock Island Rd, Prince George, BC, V2K 2K8	(604) 984-8767
All, except dry cleaning	North Shore Disposals Service Ltd	315 Edworthy Way, New Westminster, BC, V3L 5G4	(604) 988-3525
Solvents	HAZCO Environmental Services Ltd	201-5720 4 St SE, Calgary, AB, T2H 1K7	(403) 297-0444
Waste antifreeze	General Waste Disposal Corporation	2319 Commissioner St, Vancouver, BC, V5L 1A4	(604) 254-2446
Waste antifreeze	Hi - Rise Salvage Ltd	3-6785 Veyaness Rd, Saanichton, BC, V0S 1M0,	(604) 652-5663
Waste antifreeze	NEWALTA Corporation	400-333 11th Ave SW, Calgary, AB, T2R 1L9	(403) 266-6556
Waste antifreeze	Recycle West Environmental Services Inc	101-2263 Mason Ave RR#1, Clearbrook, BC, V2S 1M3	(604) 852-4465
Waste antifreeze	Strathcona Fuels Ltd	501 Industrial Park Place, Gold River, BC, V0P 1G0	
Waste antifreeze	Western Waste Management Ltd	PO Box 2066, Vancouver, BC, V6B 3S3	(604) 531-5027
Waste batteries	Alfred W. Beecroft	215-1025 Inverness Rd, Victoria, B.C., V8X 2S2	(604) 381-6827
Waste batteries	Autocore	PO Box 16, Duncan, BC, V9L 3X1	(604) 246-5899
Waste batteries	Batt Weld	404 Sumas Way, Huntington, BC, V0X 1M0	(604) 850-7248
Waste batteries	Big A Environmental Services Inc	15-20461 Douglas Crsnt, Langley, BC, V3A 4B6	(604) 534-6449
Waste batteries	Capital Salvage Co (1992)	1919 Triumph St, Vancouver, BC, V5L 1K6	(604) 253-8481
Waste batteries	Carney's Waste Service	PO Box 705, Squamish, BC, V0N 3G0	(604) 892-5604
Waste batteries	Central Salvage Ltd	RR#2 Heffley Rd, Heffley Crk, BC, V0E 1Z0	(604) 578-7654
Waste batteries	Charles Edmund Concord	RR#3, Site 14, Comp.7, Prince George, BC, V2N 2J1	(604) 962-6206

Special Waste Transporters (Cont.)

Waste batteries	Dart Trucking Inc	PO Box 89, Canfield, OH, 44406	(216) 533-9841
Waste batteries	Davis Trading & Supply Ltd	1100 Grand St, Vancouver, BC, V6A 2J6	(604) 255-3111
Waste batteries	Exide Canada Inc	394 Deerhurst Dr, Brampton,ON, L6T 5H9	(905) 790-8066
Waste batteries	Finning Ltd	555 Great Northern Way, Vancouver, BC, V5T 1E2	(604) 872-4444
Waste batteries	Gene Norman Hawthorne	3730-204A St, Langley, BC, V3A 4S4	(604) 534-1668
Waste batteries	Gold River Fuels Ltd	PO Box 106, Gold River, BC, V0P 1G0	(604) 287-4214
Waste batteries	Interior Battery Corporation	1400A Battle St, Kamloops, BC, V2C 2N8	(604) 374-8914
Waste batteries	Interstate Batteries	102-4226 Commerce Circle, Victoria, B.C., V8Z 6N6	(604) 727-2747
Waste batteries	Langtec Industries Ltd	PO Box 880, Fruitvale, BC, V0G 1L0	(604) 357-9221
Waste batteries	Leader Mercantile Ltd	2121 Panview Heights, Saanichton, BC, V0S 1M0	(604) 652-3951
Waste batteries	Magnacharge Battery Corporation	1279 Derwent Way, New WestMinster, BC, V3M 5V9	(604) 525-0391
Waste batteries	Metalex Products Ltd	2511 No 5 Rd, Richmond, BC, V6X 2S8	(604) 275-5487
Waste batteries	North Star Metal Salvage Ltd	1170 Powell St, Vancouver, BC, V6A 1J3	(604)254-2734
Waste batteries	Philip Environmental Service	9-7483 Progress Way, Delta, BC, V4G 1E1	(604) 940-9655
Waste batteries	Points North Transportation Inc	#165-6260 Graybar Rd, Richmond, BC, V6W 1H6	(604) 273-0511
Waste batteries	Ralmax Sand & Gravel Ltd	PO Box 907, Victoria, BC, V8W 2R9	(604) 386-9411
Waste batteries	Resource Recovery Corporation	1629 Alexander Ave E, Tacoma, WA, 98421	(206) 383-3044

Special Waste Transporters (Cont.)

Waste batteries	Rivtow Marine Ltd	PO Box 3650, Vancouver, BC, V6B 3Y8	(604) 251-0221
Waste batteries	Roy V Mayes	7883-110A St, Delta, BC, V4C 4K5	(604) 589-2591
Waste batteries	Skimikin Salvage	S-13, C-7, RR#1, Tappen, B.C., V0E 2X0	(604) 835-8212
Waste batteries	Superior Scrap Metal & Junk Co	1100 Powell St, Vancouver, BC, V6A 1J3	(604) 254-4010
Waste batteries	The Battery Doctors	1972 Windsor Rd, Kelowna, BC, V1Y 4R5	(604) 860-2866
Waste batteries	Trimac Transportation Services Ltd	700-800 5th Ave SW PO Box 350, Calgary, AB, T2P 2P9	(413) 298-5204
Waste batteries	Walker's Salvage and Recycling	RR#6 Site 651 C-18, Courtenay, BC, V9N 8H9	(604) 336-8866
Waste batteries	Westcan Bulk Transport Ltd	PO Box 3195, Sherwood Park, AB, T2A 2A6	(403) 279-5505
Waste petroleum products	Bob Graham Ltd	1261 Smith Ave, Quesnel, BC, V2J 2Y8	(604) 992-6600
Waste petroleum products	Bridgeway Transport Ltd	2163 Belcarra Pl, Nanaimo, BC, V9T 5S7	(604) 758-7175
Waste petroleum products	Browning Ferris Industries Ltd	5 Thorne St, Burnaby, BC, V3N 4P8	(604) 525-2072
Waste petroleum products	C.D.M. Enterprises Ltd	9695-192 Ave, Surrey, BC, V3T 4W2	(604) 882-2172
Waste petroleum products	Columbia Fuels Inc.	Box 7400, Depot 4, Victoria, BC, V9B 5B7	(604) 753-5533
Waste petroleum products	Cominco Metals Inc	Box 2000, Kimberly, BC, V1A 3E1	(604) 427-8412
Waste petroleum products	Compass Transfer Ltd	Box 6578, Fort St. John, BC, V1J 4J1	(604) 785-3037
Waste petroleum products	Duster Trucking Inc	PO Box 840, Dawson Crk, BC, V1G 4H8	(604) 843-7750
Waste petroleum products	Gold River Fuels Ltd	PO Box 106, Gold River, BC, V0P 1G0	(604) 287-4214

Special Waste Transporters (Cont.)

Waste petroleum products	H & S Waste Oil Recycling Ltd	#401-1140 Hughallan Dr, Kamloops, BC, V1S 1B4	(604) 372-5965
Waste petroleum products	Hetherington Industries Ltd	RR1, Site 107, Comp 4, Port Alberni, BC, V9Y 7L5	(604) 723-8513
Waste petroleum products	Hub Oil Company Ltd	5805 17 Ave SE, Calgary, AB, T2A 0W4	(403) 248-1900
Waste petroleum products	Jim Philippson Sandwith	7930 St. Stephens Road, RR#2, Sanichton, BC, V8M 1S2	(604) 652-2665
Waste petroleum products	Ken Johnson Trucking Ltd	24817 - 57 Ave, Aldergrove, BC, V4W 1T6	(604) 856-9668
Waste petroleum products	Ken's Septic Tank Service (1991) Ltd	3163 Humpback Rd, RR#6, Victoria, BC, V9B 5T9	(604) 478-9187
Waste petroleum products	Lomak Transport Corporation	PO Box 2329, Prince George, BC, V2N 2J8	(604) 561-1000
Waste petroleum products	Mohawk Lubricants Ltd	130 Forester St, North Vancouver, BC, V7H 2M9	(604) 929-1284
Waste petroleum products	Norco Septic Service Ltd	3914 Old Lakelse Dr, Terrace, BC, V8G 3V1	(604) 635-5832
Waste petroleum products	Petro-Canada Products	9950 Barnet Highway PO Box 6, Port Moody, BC, V3H 3E1	(604) 931-9812
Waste petroleum products	Scanland's Vacuum Tankers Ltd	2101 Theatre Road, Cranbrook, BC, V1C 6H3	(604) 426-2073
Waste petroleum products	Superior Glycleaners Environmental Ltd	10-5850 Byrne Road, Burnaby, BC, V5J 3J3	(604) 433-9494
Waste petroleum products	Ted Hough Contracting Ltd	8730 River Road, Delta, BC, V4G 1B4	(604) 946-3951
Waste petroleum products	United Oil Service	13181-116 Ave, Surrey, BC, V3R 2S8	(604) 580-2132

TECHNICAL POLLUTION PREVENTION GUIDE

FOR
THE AUTOMOTIVE RECYCLING INDUSTRY
IN BRITISH COLUMBIA

(VOLUME II)

BY

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NOTICE

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The reports for this project consist of three volumes, including the Best Management Practices, Technical Pollution Prevention Guide, and Code of Practice for the Auto Recyclers.

The reports have been subjected to Environment Canada and MOELP's peer review, and has been approved for publication.

The documents are intended as advisory guidance to auto recyclers in British Columbia in developing approaches to pollution prevention. Compliance with occupational safety and health laws is the responsibility of each individual business, and is not the focus of these documents.

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EXECUTIVE SUMMARY

The objective of this project was to provide the auto recycling industry in British Columbia with a guide for pollution control. The resulting documents are presented in three volumes:

Volume I Best Management Practices
Volume II Technical Pollution Prevention Guide
Volume III Code of Practice for the Auto Recycling Industry in B.C.

Each volume is prepared as a stand-alone document. As a result, there is some repetition in each volume regarding the industry profile, waste management methods, and regulations.

Volume I, Best Management Practices, comprises four parts: a review of the current environmental management practices; technologies used in B.C. to recycle special wastes relating to the auto recycling industry; a list of licensed special waste transporters in B.C.; and the best management practices for the industry.

To review current environmental management practices and vehicle processing procedure, six auto recycling facilities located in the Lower Fraser Valley were assessed. Practices impacting on the environment were identified, and environmental training requirements for the operators were determined.

The second section reviews technologies available in B.C. for recycling special wastes from vehicles such as used oils, oil filters, antifreeze, and acid batteries. A list of companies which process these wastes is provided in Appendix I.

The third section presents environmental best management practices (BMPs) for auto recycling facilities. BMPs are designed to provide auto recyclers with an economically feasible approach to managing special wastes in the facility. The first part of Section 3 addresses the physical and structural design requirements for the auto recycling facility. The second part covers proper procedure to manage special waste.

Volume II, Technical Pollution Prevention Guide, provides auto recyclers with a step-by-step procedure to conduct an environmental site assessment, to check compliance with the BMPs, and to help the operator develop a pollution prevention plan.

This guide also includes the British Columbia Auto Recyclers' management policy statement, a profile of the auto recycling industry in B.C., waste management practices, environmental regulations, and employee training.

Volume III, the Code of Practice for the Auto Recyclers in British Columbia, comprises a brief review of the auto recycling industries in the province, the environmental regulations governing their operation, and the Code of Practice for the industry to conduct an

environmentally sound operation. The Code of Practice includes both facility design and operational requirements. It also provides the permitting agency with the inspection procedures. The document could be used by MOELP for exempting auto recyclers from section 3 (1.1) and (1.2) of the Waste Management Act. This would lower ministry costs incurred through enforcement of the Waste Management Act.

TABLE OF CONTENTS

1.0 INTRODUCTION

Pollution prevention planning is an overall and continual evaluation of the operations in the facility. A pollution prevention program is an ongoing examination of the facility, with the goal of minimizing contamination of the environment (soil, surface, air, and groundwater). An effective pollution prevention program will:

- reduce future cleanup costs;
- reduce risk of criminal and civil liability;
- improve employee participation;
- enhance the company's image in the community; and,
- protect public health and the environment.

This guide is designed to help the operator (or on-site pollution prevention team) to conduct internal environmental and compliance audits, and to identify opportunities for pollution prevention. It provides worksheets for a pollution prevention assessment of a vehicle recycling facility.

1.1 British Columbia Auto Recycling Management Policy Statement

British Columbia Auto Recycling (B-CAR) is committed to excellence and leadership in protecting the environment. B-CAR protects the environment by providing used parts to the marketplace, thus reducing the energy and raw materials needed to produce new parts and prolonging the life span of vehicles on the road. In keeping with this policy, during the dismantling process, B-CAR strives to reduce discharges of contaminants into the surrounding environment.

In order to achieve the goals for pollution prevention in an auto recycling facility, the following should be emphasized:

- Environmental protection should be the responsibility of all operators and employees of the vehicle recycling facility.
- All operators and employees should be equally committed to the Best Management Practices.
- Changes in facility design and vehicle handling procedures should be implemented to prevent pollution of the soil, water, and air as outlined in the Best Management Practices.
- Safe storage and disposal or recycling of hazardous wastes should be provided in accordance with the Best Management Practices.

1.2 Scope and Objectives

This Technical Pollution Prevention Guide is designed to help auto recycling facilities test their own compliance with the Best Management Practices (BMPs), and to develop a pollution prevention plan.

1.3 Automotive Recycling Industry Profile

Some 100,000 automobiles are taken off the road annually in British Columbia. Roughly 30% of these vehicles have been involved in accidents and been declared by the Insurance Corporation of British Columbia to be unrepairable; others are aging vehicles that do not justify further repair.

The automobile recycling industry has been dismantling and reclaiming significant amounts of materials for the past fifty years. In British Columbia, there are 146 active automobile recycling facilities; 54 operate within the Fraser River Basin.

In 1961 an association for the automobile recycling industry was started as a division of the Automobile Retailers Association (Auto Wreckers Division). In June 1965, the Auto Wreckers and the Truck Parts Division were amalgamated to form the Used Auto and Truck Parts Division. In 1989, the name was changed to B.C. Automotive Recyclers (B-CAR). Currently B-CAR has 79 members out of 146 active automobile recyclers in British Columbia.

The auto recycling industry handles a significant quantity of hazardous materials, including:

- fuels (gasoline and diesel);
- motor oil;
- transmission fluid;
- oil filters;
- refrigerant;
- windshield-washing fluid;
- antifreeze (ethylene glycol);
- batteries (lead and sulfuric acid) and lead parts;
- parts-cleaning solvents (light hydrocarbons, e.g., Varsol, Naphtha);
- mercury switches;
- brake lining (asbestos);
- brake fluid (glycols);

- power-steering fluid;
- general lubricants;
- shop rags; and,
- airbag propellant (sodium azide).

Contamination of soils or surface waters may occur at certain areas within the vehicle recycling facility. The potential for pollution due to fluid handling may occur during fluid draining, vehicle dismantling, parts cleaning, transfer of the collected liquid wastes to storage, and in the storage area (Table 1).

It is important for an auto recycling facility to conduct an environmental review of facility operations. This is to identify all potential pollution sources, and the cost of changes in facility design or operational procedures to prevent pollution of the environment. The information is then used to identify opportunities for pollution prevention.

1.4 Environmental Regulatory Requirements

The B.C. Waste Management Act regulates discharges into the environment, and special waste spill reporting, registration, storage, and transportation.

1.4.1 Discharge into the Environment

According to section 3 of the Waste Management Act, "No person shall, in the course of conducting an industry, trade, or business, introduce, cause, or allow waste to be introduced into the environment." In simpler words, no one may pollute the environment through running a business. The Act also prohibits the introduction of waste into the environment in such a manner or quantity as to cause pollution, "except as permitted, approved, or according to an order, regulation, or a waste management plan approved by the minister." Again, in simpler words, you need a special government permit to pollute, and that permit will require strict controls.

1.4.2 Spills Reporting

According to section 10 of the Waste Management Act, if a spill occurs in a quantity equal to or greater than that listed in column 4 of Table 2, the person in possession of the substance immediately before the spill shall report the spill to the Pollution Emergency Program at 1-800-663-3456 or (604) 387-5956 in Victoria, or to the local police or RCMP. As a result, MOELP may take actions, including constructing containment structures, and conduct investigations at the expense of that person.

Table 1: Potential Environmental Problem Sources

Area of Operation	Potential Problem
Receiving area	• Leaks of oils, gasoline, and antifreeze during temporary storage.
Dismantling pad	• Spills and leaks of fluids during fluid draining and dismantling. • Stormwater runoff from pad to surrounding soils. • Percolation of contaminants to ground through cracks in the concrete pad. • Increased runoff at uncovered dismantling pad. • Lack of spill containment and spill control equipment.
Parts-cleaning unit	• Spills and splashes during cleaning and rinsing. • Drips of oils and solvent during parts transfer. • Lack of secondary containment. • Lack of spill control equipment. • Air emissions.
Pressure-cleaning unit	• Pressure wash water containing oils are lost to surrounding soils and stormwater drains. • Lack of equipment for oil removal from contaminated water.
Liquid storage	• No secondary containment or lack of spill control. • Potential loss to soil. • Air emissions from improperly sealed containers.
Parts storage	• Residual oils from parts stored without cover drip into soil or are washed off part surfaces during rain storms. • Lack of secondary containment for oil-containing parts.
Core storage	• Residual oils from cores stored without cover drip into soil or are washed off from core surfaces during rain storms.
Hulk storage	• Oil drips from unsealed oil lines and greasy parts and engine. • Leachate from contaminated soils.
Battery storage	• Acid and lead loss to soil possible from batteries stored in improper containers.
Crushing area	• Drippage of oil from parts that are not completely drained. • Crushing on an unpaved area without a drip-pan under the crusher. • Lack of spill control equipment.

Table 2: Generator Registration, Storage Permit, and Reportable Spill Quantities

Column 1 Waste Classification or Name	**Column 2** Registration Quantity (kg or litre, as appropriate)	**Column 3** Storage Permit Quantities (kg or litre, as appropriate)	**Column 4** Reportable Spill Quantities (kg or litre, as appropriate)
R12, Dichlorodifluoro-methane (2.2)**	1,000*	10,000*	10
Gasoline (3.1)**	100	1,000	100
Antifreeze (6.1)**	100	1,000	5
Waste oil or waste oil contaminated with lead	5,000	50,000	100
Waste batteries	2,000	10,000	N/A
Mercury (8)**	100	1,000	100

*total liquid volume capacity of containers; however, tanks should only be filled to 80% of rated volume at 21°C.

**Class according to the Transportation of Dangerous Goods Regulation

1.4.3 Registration of Special Waste

The Special Waste Regulation (section 43) requires registration of facilities which, within a thirty-day period, handle quantities of special wastes greatere than in Table 2 (column 2). These facilities must make a Generator Registration Report, and must apply for a Consignor Identification Number with the Director, Industrial Waste and Hazardous Contaminants Branch, or with a Regional Environmental Protection Manager of the MOELP.

Facilities which handle registerable quantities of special wastes, but treat or dispose of them immediately, are still required to register the wastes. However, facilities which recycle the special wastes on the site where they generate them, and do not store them for a time exceeding 14 days before they recycle them, are not required to register their special wastes.

1.4.4 Storage

The Waste Management Act prohibits storage of more than a specific amount of special waste, unless special approval or a permit has been given. These prescribed amounts are shown in Table 2 (column 2).

Facilities storing larger amounts than these are required to make a Generator Registration Report with the Director, Industrial Waste and Hazardous Contaminants Branch, and apply for a Consignor Identification Number, as required by the Special Waste Regulation (section 43).

Facilities which, for a period longer than 14 days, store more special waste than the amounts listed in Table 2 (column 3) are also required to apply for a Storage Permit, according to the Waste Management Act (section 4), and the Special Waste Regulation (section 48).

The Special Waste Regulation (section 50.4) bans storage of incompatible special wastes in one container. Incompatible materials are those that if stored together under normal conditions of storage or transportation will produce heat, a gas, a corrosive substance, or a toxic substance. Also, containers must be kept closed at all times other than for filling, transferring, or emptying materials, and the containers must be handled in such a way so as not to cause them to leak or rupture.

1.4.5 Transportation

The Waste Management Act (section 5) requires that for transportation of special wastes, if the quantity of special waste is greater than the amounts shown in Table 2 (column 2), a manifest must accompany the shipment, and the carrier must be licenced.

Any person who wants to have shipped a quantity of special waste in excess of that shown in Table 2 (column 2) must obtain a Consignor Identification Number (Special Waste Regulation, section 44).

Any shipment of special waste in excess of 5 kg of solids, or 5 litres of liquid or gas, must be accompanied by a manifest, as required by section 46 of the Special Waste Regulation. However, waste oil, paint, and batteries may be transported in greater quantities without a manifest, the quantities being less than 205 litres and 1,000 kg, respectively.

A manifest is not required for transportation of special waste on public roads if the transport distance is less than 1 km. It is also not required for distances of less than 100 km within the boundaries of the generator's owned, leased, or controlled property.

For loads requiring a manifest, carriers of special wastes must have a transport licence issued by the Director, Industrial Waste and Hazardous Contaminants Branch, according to the Special Waste Regulation (section 45).

1.5 Employee Training

Certification Training Program

The following are the training requirements for employees. The operator of the facility must be certified by attending a training program under the auspices of B-CAR. The training program includes the following topics:

- waste management regulations;
- health and safety regulations;
- B.C. Fire Code;
- spill control planning, and use of proper protective equipment;
- good housekeeping and preventative maintenance;
- handling practices of special wastes; and,
- hazards of special wastes handled on the facility.

In-House Training:

Employee training must be provided annually by the vehicle recycling facility. The topics to be discussed include:

- an updated Pollution Prevention Plan (PPP) for the facility;
- the spill response procedure;
- good housekeeping and preventative maintenance BMPs; and,
- environmentally acceptable material handling practices, particularly those related to vehicle fluids, including fuels.

2.0 DEVELOPMENT OF A FACILITY-SPECIFIC POLLUTION PREVENTION PROGRAM

This section provides a description of each step to develop a pollution prevention plan for the facility and to enable the facility operator to conduct an environmental audit and to examine facility compliance with the regulations. Pollution prevention planning is a thorough and continual evaluation of the recycling processes in the facility. The elements of a pollution prevention program include building support throughout the company, organizing the program, setting goals and objectives, and performing a preliminary Pollution Prevention Program. Figure 1 shows the procedure for development of a pollution prevention program and Table 3 gives a detailed description of the procedure for developing a pollution prevention plan, with reference to the text and the worksheets to be used.

2.1 Program Organization

Organization of a pollution prevention program requires involvement of all employees and commitment to environmental protection. Employees feel committed to pollution prevention when they actively participate in organizing the program and are encouraged to:

- help define company goals and objectives;
- review processes and operations to determine how spills of special wastes can be avoided to better protect their health and the environment;
- recommend ways to eliminate or reduce the potential for a spill; and,
- design or modify ways for safer special waste handling.

A pollution prevention program starts with selecting a special team, and sets the goals of the program. The team will be responsible for developing and implementing the pollution prevention plan.

2.1.1 Team Member Selection

The pollution prevention team consists of one or more persons, depending on the size of the facility. The responsibilities of the team include:

- managing the pollution prevention program;
- developing the pollution prevention plan; and,
- implementation of the plan.

Figure 1: Pollution Prevention Program Development

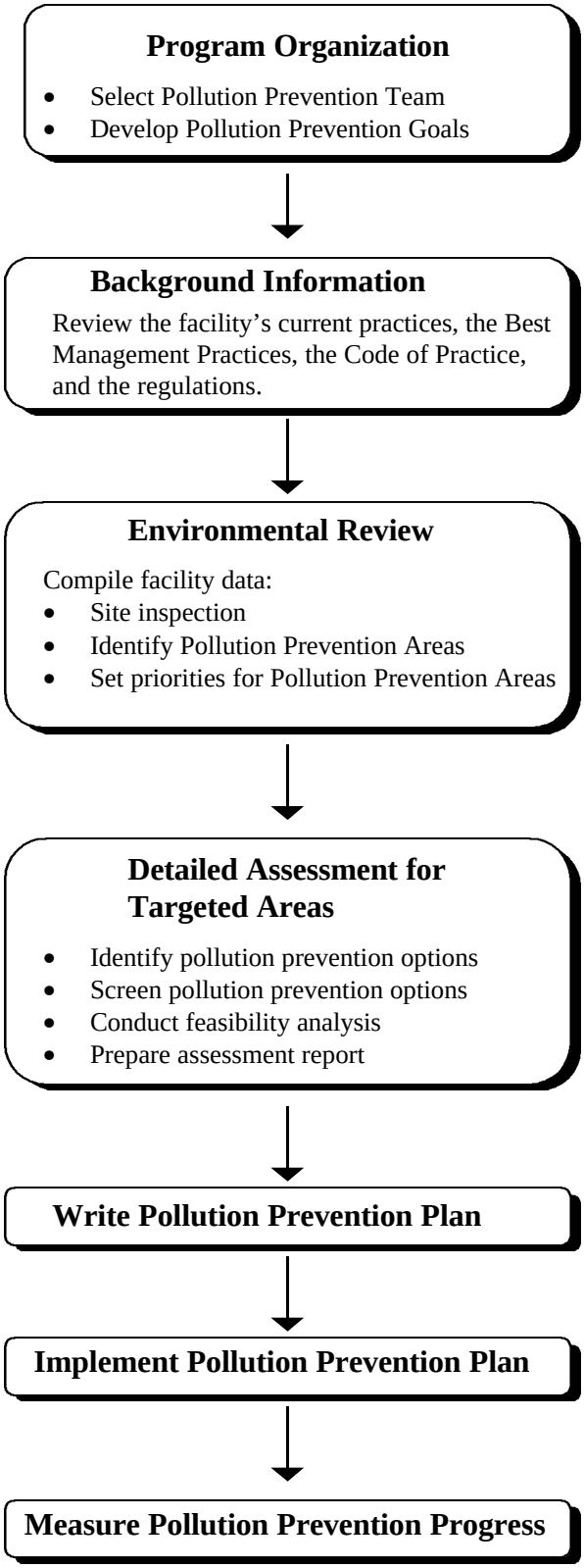


Table 3: Developing a Pollution Prevention Plan

Step	Item	Details	Source of Information/Worksheet to be Used
1	Program Organization	Select Pollution Prevention Options	• Section 2.1.1
		Develop Pollution Prevention Goals	• Section 2.1.3 • (Worksheet 1A)
2	Background Information	Review the facility current practices, Best Management Practices, Regulations & Code of Practice	• Section 1.4 • Best Management Practices, Vol. I, Section 4 • Code of Practice, Vol. III, Section 3
3	Environmental Review	Compile facility data	• Facility Profile (Worksheet 2A) • Facility Description (Worksheet 3A) • Site Layout (Worksheet 4A) • Input Materials (Worksheet 5A) • Waste Materials Information (Worksheet 6A) • Waste Management Methods (Worksheet 7A)
		Site Inspection *Information gathered in Worksheet 1B - 11B are used to prepare a summary of the environmental review (Worksheet 8A)*	• Good Housekeeping (Worksheet 1B) • Spill Prevention-Spill Control (Worksheet 2B) • Employee Training (Worksheet 3B) • Vehicle Receiving Area (Worksheet 4B) • Dismantling Area (Worksheet 5B) • Vehicle Crushing (Worksheet 6B) • Parts Cleaning (Worksheet 7B) • Parts Storage Area (Worksheet 8B) • Hulk Storage Area (Worksheet 9B) • Liquid Waste Handling (Worksheet 10B) • Solid Waste Handling (Worksheet 11B)

Table 3: Developing Pollution Prevention Plan (Continued)

Step	Item	Details	Source of Information/Worksheet to be Used
3	Environmental Review (*Continued)*	Summary of Environmental Review Results	• (Worksheet 8A)
		Prioritize Pollution Prevention Areas	• (Worksheet 9A)
4	Detailed Assessment of Targeted Areas	Identify Pollution Prevention Options	• (Worksheet 10A)
		Conduct Feasibility Analysis	• Section 5.3
		Screen and Rank Pollution Prevention Options	• (Worksheet 11A)
		List Pollution Prevention Options to be Implemented	• (Worksheet 12A)
5	Write Pollution Prevention Plan		• Section 6 • (Worksheet 13A)
6	Implement Pollution Prevention Plan		• Section 7
7	Measure Pollution Prevention Progress		• Section 8

The capabilities and attitudes of the team are important for the success of the program. As with other areas of the facility operation, a successful program will require integration and uninterrupted planning, implementation, modification, and maintenance of the plan at its different stages.

The members of the team should have substantial environmental, technical, business, and communication skills as well as thorough knowledge of the company. The team leader should be the manager of the facility, to keep the program on track, and to ensure that pollution prevention becomes an integral part of the overall corporate plan.

The areas of expertise to consider for the team members include:

- management and leadership capability. The team leader is capable of developing and enforcing a pollution prevention program;
- understanding of the company's operating procedures;
- a thorough knowledge of the facility's operation in order to evaluate pollution sources and potential means for pollution prevention;
- knowledge of legal requirements and discharge permits that the facility might have;
- familiarity with health and safety regulations for all procedures on the facility (i.e., Workers' Compensation Board, WHMIS, MSDS Sheets);
- knowledge of currently available technology for pollution prevention in the automotive recycling industry; and,
- understanding of environmental impact of discharges from automotive recycling facilities.

2.1.2 Company Policy

The company should develop a pollution prevention policy statement which states the reason for establishing the pollution prevention program, qualitative goals to accomplish, and a person in charge. Two examples are shown in Table 4.

The company policy statement will be written in the Pollution Prevention Plan Worksheet 1A (Appendix A).

Since the daily activities of the workers involve handling waste, the support of those workers is essential, and their attitude has a significant effect on the success of the pollution prevention program. After preparing the pollution prevention policy of the company, the facility manager should hold a meeting with the employees in order to publicize the policy, emphasize the company's commitment to pollution control, and encourage employee participation. This will establish a positive atmosphere and may elicit worthwhile pollution prevention suggestions.

Table 4: Examples of Company Policy Statements

POLICY STATEMENT EXAMPLE 1 - "(Your Company Name) is committed to excellence and leadership in protecting the environment. In keeping with this policy, our objective is to reduce waste and emissions into the surrounding environment. We strive to minimize adverse impact on the air, water, and land through pollution prevention and energy conservation. By successfully preventing emissions, we can achieve cost savings, and improve the environment. (The Company Name)'s environmental guidelines include the following:

- Environmental protection is everyone's responsibility. It is valued and displays commitment to (The Company Name).

- We will commit to including pollution control and energy conservation in our operation.

- (The Company Name) is committed to identifying and implementing pollution prevention opportunities through encouraging and involving all employees.

- Technologies and methods which substitute non-hazardous materials and utilize other source reduction approaches will be given top priority in addressing all environmental issues.

- (The Company Name) seeks to demonstrate its responsible corporate citizenship by adhering to all environmental regulations. We promote cooperation and coordination between industry, government, and the public toward the shared goal of preventing pollution at its source."

- **POLICY STATEMENT EXAMPLE 2 -** "At (The Company Name), protecting the environment is a high priority. We are pledged to eliminate or reduce emissions to the water, soil, and air, and to minimize our use of energy and generation of all wastes, whenever possible. When waste cannot be avoided, we are committed to recycling, treatment, and disposal in ways that minimize undesirable effects on air, water, and land."

(Adapted from: Waste Reduction Institute for Training and Applications Research, Inc. [WRITAR], Survey and Summaries, 1991; and Minnesota Office of Waste Management, Feb. 1991, Minnesota Guide to Pollution Prevention Planning)

2.1.3 Establish Pollution Prevention Goals

The program leader will need to establish goals that state the long-term direction for the pollution prevention program. The goals should be well-defined, meaningful to all employees at the facility, and adaptable to changing conditions at the auto recycling facility.

Pollution prevention goals can be qualitative such as, “achieve a significant reduction of toxic (oil, fuel, antifreeze, etc.) discharges to the soil and surface water”.

Quantitative goals are more difficult to develop, but they are worth the extra effort. They spell out the operator’s pollution prevention commitment, and they give all participants and observers a method for measuring progress. An example for a quantitative goal statement is “the reduction of toxic effluent to the surface water by 95%”.

Later on, as the pollution prevention program becomes more focused, and the pollution-specific aspects of the operation become better known, the goals can be refined. They can be adjusted as the program matures, and as lessons are learned. Periodic goal achievement review and adjustment will keep the program active and visible within the company. The goals will be shown in Worksheet 1A (Appendix A).

2.1.4 Background Information

The pollution prevention team will review the facility, the current practices, the Best Management Practices, and the regulations (see Section 1.4 of this volume) to characterize the automobile recycling process, and to identify areas where action may be taken for pollution prevention.

3.0 ENVIRONMENTAL REVIEW

The pollution prevention team will conduct an environmental review of the facility by:

- compiling facility data;
- site inspection;
- identification of pollution prevention areas; and,
- assigning priorities to pollution prevention areas.

3.1 Plant Data Compilation

This involves the collection of data available at the facility regarding:

- environmental permit requirements;
- process description;
- raw materials used;
- waste material; and,
- waste management methods.

The data can be gathered from the following documents (if available):

- waste shipment manifests;
- hazardous waste storage reports;
- wastewater analysis;
- environmental audit reports;
- material safety data sheets;
- operating procedures; and
- waste handling, treatment, disposal costs, and revenues.

3.2 Process Description

This section contains a description of the facility operations (Worksheets 2A, 3A, and 4A). In Worksheet 3A, the operator includes in the description of the facility operations:

- the procedure for dismantling the vehicles from the time the vehicle arrives at the facility to the time the hulk and parts are sold for reuse, or recycled by a steel recycler;

- vehicle processing levels (e.g., number of vehicles received per month) and regulatory permits; and,
- the procedure followed for liquid and solid waste removal from the vehicles until they are reused or disposed of.

Worksheet 4A includes a site layout which shows the location of each process area, sewers, treatment system, and direction of flow of stormwater runoff.

3.3 Raw Materials

This includes the type, quantities, and cost of solvents and chemicals used in the facility, active ingredients, components of concern, and storage conditions (Worksheet 5A). Worksheet 5A shows "Visol" as an example of the materials to be described. A blank sheet is attached for your use. Each blank sheet can be used to describe two raw materials.

3.4 Waste Materials

The operator will gather information about each waste managed in the facility including types, quantities, and hazardous properties of these wastes as described in Worksheet 6A. This sheet includes most of the special wastes which may be managed in the facility. Please complete the information requested in the blank spaces. Attached is a blank sheet for your use, if there are other special wastes which are not described in these sheets.

3.5 Waste Management Method

Gather the following information about the waste management methods used in the facility, including:

- material storage methods;
- cost of waste management;
- reuse, recycling;
- treatment/disposal methods; and,
- Best Management Practices.

Worksheet 7A contains general information about the special wastes managed in auto recycling facilities. Complete the worksheet with the information gathered and use the attached blank sheet to add any special wastes not mentioned in this worksheet.

3.6 Environmental Permits

This includes a list of requirements in the permits needed by the facility for wastewater, air, special waste, solid waste, and discharges into the receiving environment.

3.7 Site Inspection

The objective of a site inspection is to review the accuracy of the information collected and to gather more information about the potential environmental waste problems. The site visit will provide information needed to identify the pollution source problem areas, and to prioritize the environmental problems to be addressed.

The worksheets provided in Appendix B provide checklists and contain questions which will help the pollution prevention team conduct the environmental assessment and identify areas which require action to control pollution on-site.

3.8 Identification of Pollution Prevention Areas

For automobile recycling facilities, the areas of concern include the receiving area, dismantling pad, parts-cleaning unit, pressure-cleaning unit, fluid storage, parts storage, core storage, hulk storage, battery storage, and the crushing area.

Worksheets 1B - 11B (Appendix B) identify areas where the facility does not comply with the Best Management Practices outlined in Vol. I, Section 4. Identified areas and activities of environmental concern will be reported in Worksheet 8A.

3.9 Assigning a Priority List of Pollution Prevention Potential

The team can now develop criteria for identifying and selecting process areas for further pollution prevention opportunities. Typical criteria for prioritizing areas as a target for pollution prevention options are:

- compliance with the Best Management Practices;
- cost of waste management (pollution control, treatment, and disposal);
- compliance with current and anticipated environmental regulations;
- impacts on environment (on soil, stormwater runoff, groundwater, and surface water);
- impacts on public health;
- potential environmental and safety liability;
- minimization of waste discharges;
- hazardous properties of waste, including toxicity, flammability, corrosivity, and reactivity;

- available budget for pollution prevention projects; and,
- potential for implementing on-site reuse or recycling.

Also, priorities for improvements should be given to the quality of discharges or air emissions into adjacent sensitive environments (such as water bodies, schools, playgrounds, hospitals, etc.).

Based on the above criteria, the list of potential pollution prevention areas are then assigned a priority. The ranking of these areas will be based on the degree of pollution the area is contributing, and on the compliance with the Best Management Practices.

Use Worksheet 9A for ranking various pollution prevention areas.

4.0 DETAILED ASSESSMENT

The worksheets completed during the environmental review identify specific problems in various areas of the facility. Review those processes to ensure correctness of the completed worksheets. Conduct a thorough and detailed site inspection of the targeted areas to identify operating parameters and other factors that were missed or poorly documented.

The areas identified in Worksheet 9A as a source of environmental problems will undergo a detailed assessment to identify and screen various pollution prevention options. The selected options will be incorporated in the pollution prevention plan. The assessment will be based on the prioritized list of potential sources of contamination, with emphasis on the high ranking process areas. Low priority process areas should also be evaluated, but implementation may be executed at a later stage. The economic feasibility of the options, which are presented in the Best Management Practices for the industry, should be evaluated also.

5.0 POLLUTION PREVENTION OPTIONS

The detailed assessment of problem areas, assigning priorities to them, and assessing pollution prevention options follow logically in the Pollution Prevention Plan.

5.1 Identification of Pollution Prevention Options

In order to identify potential pollution prevention options, it is necessary to retrieve information from a variety of sources. Most information is outlined in detail in the Best Management Practices (Vol. I, Section 4). Available options for the automotive recycling industry include the following:

1. Improving the physical and structural design of the recycling facility to ensure an efficient dismantling procedure, and a minimization of discharges into the environment. Design has to be reviewed for areas requiring detailed assessment according to ranking in the priority list. These areas may include:
    - site layout;
    - vehicle receiving area;
    - dismantling area;
    - parts-cleaning systems;
    - fluid storage area;
    - parts storage area;
    - hulk storage area; and,
    - vehicle crusher area.

2. Improving operational procedures to minimize negative impact on the environment during dismantling, fluid handling, and waste storage and disposal. The following procedures should be included in the pollution prevention program:
    - Establishing good housekeeping and preventative maintenance practices in all areas of the facility.
    - Use of proper spill prevention measures and spill control equipment in all areas of the facility.

The Best Management Practices outline the Pollution Prevention options for each procedure at the automobile recycling facility. However, facility-specific pollution prevention options need to be developed to ensure effectiveness of the pollution prevention program.

It is important to review outside technical information sources for industrial sector-specific pollution prevention measures. These might include:

- federal, provincial, and local environmental agencies, and CCME (Canadian Council of Ministers of Environment);
- USEPA (U.S. Environmental Protection Agency) and state environmental agencies;
- trade associations;
- Canadian Standards Association (Standards and Guidelines);
- published literature;
- special waste haulers;
- equipment vendors (such as parts washer supplier);
- other automotive recycling operations; and,
- consultants.

5.2 Screening of Pollution Prevention Options

To evaluate pollution prevention options, a technical, economic, and environmental feasibility analysis needs to be conducted. Since this feasibility analysis can be costly, the proposed options may be screened by the assessment team. Some options will be found to have no cost or risk attached, and these can be implemented immediately. Others will be found to have marginal value, or to be impractical. These will be dropped from further consideration. The remaining options will generally be found to require feasibility assessment.

This screening does not require detailed and costly study. Screening procedures can range from an informal review with a decision made by the team members. The following are questions to be considered in option screening:

- Which option will best achieve the goal of preventing environmental pollution?
- Which are the main benefits to be gained by implementing this option (e.g., saving cost of remediation, compliance, liability, workplace safety, etc.)?
- Do the necessary materials and technologies exist to develop the option?
- How much does it cost? Does it appear to be cost-effective, meriting an in-depth economic feasibility assessment?
- Can the option be implemented within a reasonable amount of time without disrupting the operation at the vehicle recycling facility?
- Does the option have a good track record? If not, is there convincing evidence that the option will work as required?

- What other areas or operations at the facility will be affected by implementing this option?

The informal review is a procedure by which the assessment team selects the options that appear best, following discussion and examination of each option. As is the case when the team is proposing options, their approach to screening should employ group decision-making techniques whenever possible. Use Worksheet 10A to list the target areas and various pollution prevention options for each area.

5.3 Feasibility Assessments

The final product of this phase is a prioritized list of pollution prevention options. These options should now be examined to determine which are technically, environmentally, and economically feasible and to prioritize them for implementation.

5.3.1 Technical Evaluation

The team will perform a technical evaluation for a each pollution prevention option. The following questions provide the criteria to be considered in the technical evaluations:

- Will the option reduce the potential of spills of special waste and/or other hazardous materials?
- Will the option reduce the potential of soil and water contamination?
- Is the option safe for the workers?
- Will the dismantling procedures, parts resale, hulk storage and crushing be improved or maintained?
- Are the changes compatible with all procedures on the facility?
- How long will the operations on the facility be stopped during installation?
- Will the vendor provide acceptable service?
- Will the new system create other environmental problems?

5.3.2 Environmental Evaluation

In this step, the pollution prevention team will weigh the advantages and disadvantages of each option with regard to protecting the environment and human health. Some options require a thorough environmental evaluation, especially if they involve process changes. For example, substitution of one solvent-based parts cleaner with a steam cleaner might solve the problem of using hazardous material, but would contribute to the generation of wastewater if a zero-discharge system is not used.

To make a sound evaluation, the team should review the environmental aspects of the specific design of the area in need of pollution prevention action, or of operational procedures within those areas.

5.3.3 Economic Evaluation

Estimating the costs and benefits of most pollution prevention options applicable to vehicle recycling facilities is straightforward. If a project has no significant capital costs, the decision is relatively simple; its profitability can be judged by whether or not it reduces or prevents pollution. Other options which have cost or risk attached to them should undergo economic evaluation, after consideration of the technical and environmental criteria.

The U.S. Environmental Protection Agency (USEPA) has adopted the Total Cost Assessment (TCA) for evaluating pollution prevention projects. The TCA analyzes direct costs, indirect costs, liability costs, and less tangible benefits over a long period of time, as shown in Table 5. In calculating the total cost, net savings are indicated by positive value, and net costs by a negative value.

While it may be quite easy to obtain information on direct cost, estimating some of the future liabilities and less tangible costs may be more difficult. Incorporate all direct costs and as many indirect costs as possible.

Direct Costs

Direct costs for pollution prevention are net costs to the company. Confining the costs analysis to direct costs may lead to the incorrect conclusion that pollution prevention is not a sound business investment.

Indirect Costs

Indirect costs include regulatory compliance costs and on-site management costs. These will result in a net cost.

Liability Costs

The reduction in liability associated with pollution prevention investment may offer significant net saving to the auto recycling facility. Potential reduction in penalties, fines, cleanup costs, and damage claims can make pollution prevention investment more profitable, particularly in the long run.

Estimating future liability costs is subject to a high degree of uncertainty. It may, for example, be difficult to estimate liabilities which may arise from non-compliance with regulatory standards that do not yet exist. Similarly, damage claims that may result from claims of contamination of the operation site or neighbouring sites may be difficult to

estimate. However, you may be able to estimate such liability by citing penalties reported on a claim for similar violation of the Waste Management Act or cost of site cleanup if pollution prevention measures are not taken.

Table 5: Cost Assessment Table

Cost	Description
Direct Costs	• Capital Expenditures ◊ Buildings ◊ Equipment & installation ◊ Utility connections ◊ Project engineering • Operation & Maintenance Costs ◊ Raw materials ◊ Labour ◊ Waste disposal ◊ Water and energy • Value of recovered materials
Indirect Costs	• Regulatory Compliance Costs ◊ Permitting ◊ Record keeping & reporting ◊ Monitoring cost • On-site Waste Management
Liability Costs	• Penalties • Fines • Personal Injury • Property Damage • Remediation Costs
Less Tangible Benefits	• Increased income due to: ◊ enhanced company image ◊ improved relationship with regulators

If the value for the liability cost is difficult to estimate, a description of the reduction of liability associated with the pollution prevention alternative may be indicated. Alternatively, the internal rate of return (a commonly used financial indicator) can be lowered from 15% to 10%.

Less Tangible Benefits

Pollution prevention may deliver substantial benefits from improved company image, such as increasing company income, and an improved relationship with regulators. These benefits are difficult to measure; however, they should be incorporated into the assessment wherever possible. Alternatively, the less tangible benefits may be evaluated qualitatively in the cost assessment.

Note that the cost analysis should consider a long time period and the present value of the money. Since many of the liabilities and less tangible benefits of pollution prevention will occur over a long period of time, the economic assessment should consider a long time frame, rather than the three to five years typically used for other types of projects. Although a long time frame increases the uncertainty of the cost factor used in the analysis, it emphasizes the importance of implementing the pollution prevention options.

To account for the time value of the investement during the life of the pollution prevention option, several financial indicators could be used. Three commonly used financial indicators which meet these criteria are:

- Net Present Value (NPV);
- Internal Rate of Return (IRR); and,
- Profitability Index (PI).

Discussion of these indicators is beyond the scope of this study but can be found in economic analysis texts.

The net present value (NPV) of the pollution prevention option can be applied to determine economic viability of pollution prevention options. The net present value is the present value of the total cost of the pollution prevention option. It is calculated over the lifetime of each option to determine whether the implementation of the particular option will result in net financial savings or losses based on the assumptions used in the financial analysis.

5.4 Rank of Pollution Prevention Options

Use Worksheet 11A to report the rank of each pollution prevention option. The following guidelines for ranking pollution prevention options should be observed:

- Pollution prevention options required by regulations or permits, or which have no cost or risk attached to them have highest priority.
- The remaining options are ranked according to decreasing net present values.

5.5 Prepare and Review the Pollution Prevention Options Report

Prepare a report containing the results of the detailed assessment regarding the pollution prevention options. This report should include:

- proposed pollution prevention options;
- option screening results; and,
- feasibility analysis results.

The screened pollution prevention options should be listed together with results of the feasibility study. Use Worksheet 11A to prepare this report.

6.0 PREPARING THE POLLUTION PREVENTION PLAN

The pollution prevention team will write a report that summarizes the results of the pollution prevention program developed for the facility. The facility pollution prevention plan will include the following, as prepared in Appendix A:

1. Worksheet 1A which includes:
    - A written policy of management support for the pollution prevention plan, and a commitment to achieve the goals established; and,
    - The scope and objectives of the pollution prevention plan.

2. Worksheet 2A which includes:
    - A description of the facility operations (e.g., dismantling, parts resale, hulk storage, etc.); vehicle process levels (e.g., number of vehicles received per month), and regulatory permits; and, a description of waste management practices at the facility.

3. A summary of review results from the completed worksheets in Appendix A, including the waste leaving the plant, the treatment and disposal of wastes, current pollution prevention activities, and prioritized waste stream or process areas for detailed assessment.

4. A plan to perform a detailed assessment, or a summary of assessment results, including facility-specific criteria for prioritizing pollution prevention options, and a listing of feasible pollution prevention options (Worksheet 11A).

5. A selection of pollution prevention options to be implemented. For each selected option, the area on the facility it affects should be identified (Worksheet 12A).

6. A three-year implementation schedule which presents the planned pollution prevention implementation activities for each of the three calendar years following the completion of the pollution prevention plan (Worksheet 13A).

7.0 IMPLEMENT POLLUTION PREVENTION PLAN

The pollution prevention team will seek to secure funding for those projects that will require capital expenditures (e.g., roof construction, zero-discharge parts washer). Other pollution prevention options that do not require significant capital expenditures can be implemented immediately (e.g., plugging of fluid hoses after draining, separating reusable from waste antifreeze, etc.).

The pollution prevention process does not end with implementation. After the plan is begun, track its effectiveness against the claims made (technical, economical, etc.). Options that do not meet the original performance expectations may require reworking or modifications. Above all, use the knowledge gained by continuing to evaluate and fine tune the pollution prevention projects.

8.0 MEASURING POLLUTION PREVENTION PROGRESS

The progress achieved in pollution prevention should be evaluated. Does the newly installed roof over the dismantling pad actually prevent further contamination of the surrounding soils? Does the closed-loop steam cleaning system or the oil-water separator work effectively to prevent oil discharge into nearby surface waters?

The objective of a progress assessment is to conduct quantitative evaluation of pollution reduction after putting pollution prevention options in place. The information can be used by facility operators and environmental agencies in evaluating successes and failures, and to guide future efforts. The results of the evaluation may also be used to identify new pollution prevention options.

The success of the implemented options should be compared to the initial goals as stated in the pollution prevention report. The anticipated results are outlined in the plan (Worksheet 10A) and should be achieved after implementation of the pollution prevention option.

By reviewing the program's successes and failures, the team can assess the degree to which goals are being met, and what the economic results have been.

An annual pollution reduction progress report must be prepared to document and track the efforts at the facility. The report should contain information on:

- progress towards pollution reduction/prevention goals;
- pollution prevention options implemented;
- facility areas affected;
- operational practices affected; and,
- problems encountered during implementation of pollution prevention options.

APPENDIX A

POLLUTION PREVENTION PLAN

Worksheet 1A
Facility Identification

Facility Name:_____

Management Policy:

Write a management policy expressing support for planning and a commitment to implement pollution prevention activities and achieve the established goals at your vehicle recycling facility.

Scope and Objectives:

Identify the areas and/or operational practices of your vehicle recycling to be covered by the plan. State the goals to be achieved through implementation of the pollution prevention options. State the goals as identified during Step 1.

Management Signature:

The owner or operator of the vehicle recycling facility.

Date: _____ Signature: _____

Pollution Prevention Plan prepared by:

Date: _____ Name: _____

Worksheet 2A
Facility Profile

General Facility Information

Facility Name: _____

Address: _____

City/Province: _____

Postal Code: _____

Telephone/Fax: _____

Lead Person of Pollution Prevention Team: _____

Facility Production Information

Processes:

Parts Resale?	❑ Yes	❑ No
Parts dismantled by operator prior to resale?	❑ Yes	❑ No
Parts dismantled by customer?	❑ Yes	❑ No
Vehicles crushed on-site?	❑ Yes	❑ No

Number of cars processed/year:

Is there any seasonal variation in the operation of the automotive recycling facility?

Describe: _____

_____

_____

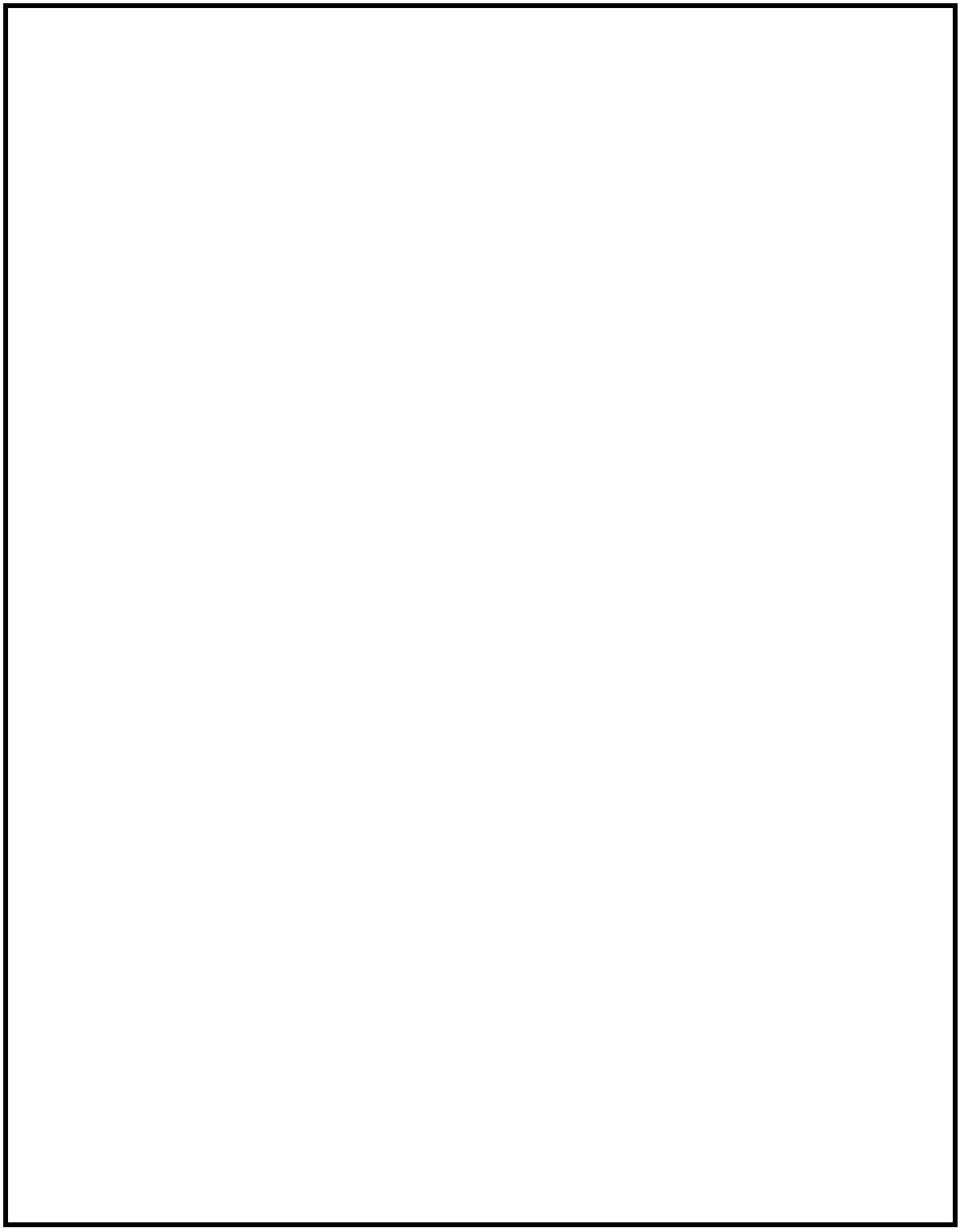
Regulatory Information

What permits does your vehicle recycling facility carry?			Permit No.
1)	Liquid Waste Permit	❑ Yes ❑ No	
2)	Air Permit	❑ Yes ❑ No	
3)	Special Waste Storage Permit	❑ Yes ❑ No	
4)	Others (please list on separate sheet)	❑ Yes ❑ No	

Worksheet 3A
Description of the Facility Operations

Include a description of the facility procedure for dismantling vehicles, commencing with the arrival of the vehicles at the facility, and ending with the time the hulk and parts are sold for reuse or for recycling by a steel recycler. Also include the procedure for liquid and solid waste removal from the vehicles and handling until the wastes are reused or disposed of. Extra sheets may be used as needed.

Worksheet 4A
Site Layout



Worksheet 5A (page 1 of 2)
Input Materials

Attribute	Description	
	Example	
Material name	Visol GP Low Odour Solvent	
Usage	solvent parts washer	
Source/supplier	Imperial Oil	
Hazardous ingredients	light distillate-hydrotreated	
Hazardous properties	flammable, poisonous, eye & skin irritant	
Media (gas, liquid, solid)	liquid	
Usage rate		
Unit cost		
Delivery mode (e.g., trucks)		
Shipping container size & type (e.g., 45 gal. drum, 100 lb. paper bag, etc.)		
Unloading method (e.g., forklift)		
Storage location (outdoor, covered, etc.)		
Shelf life		
Empty container disposal method (e.g., return to supplier, recycle, etc.)		
Supplier would: • accept shipping containers (Y/N) • accept expired materials (Y/N)		
Alternate supplier		
Alternate material		

Comments: _____

_____

Worksheet 5A (page 2 of 2)
Input Materials

This page is a blank worksheet for your use.

Attribute	Description	
Material name		
Usage		
Source/supplier		
Hazardous ingredients		
Hazardous properties		
Media (gas, liquid, solid)		
Usage rate		
Unit cost		
Delivery mode (e.g., trucks)		
Shipping container size & type (e.g. 45 gal. drum, 100 lb. paper bag, etc.)		
Unloading method (e.g., forklift)		
Storage location (outdoor, covered, etc.)		
Shelf life		
Empty container disposal method (e.g., return to supplier, recycle, etc.)		
Supplier would: • accept shipping containers (Y/N) • accept expired materials (Y/N)		
Alternate supplier		
Alternate material		

Comments: _____

_____

_____

Worksheet 6A (page 1 of 5)
Waste Materials Information

Attribute	Description		
Material name	Antifreeze	Used oil	Automatic transmission fluid
Hazardous ingredients	Ethylene glycol, could contain oil and heavy metals	petroleum hydrocarbons, heavy metals	petroleum hydrocarbons, heavy metals
Hazardous properties	poisonous, fire hazard, eye irritant	mild eye & skin irritant	flammable
Media (gas, liquid, solid)	liquid	liquid	liquid
Fate of waste material (e.g., reuse, off-site disposal, on-site recycling)			
Waste management cost			
Waste shipping mode (e.g., truck)			
Waste shipping container size & type (e.g., 45 gal. drum)			
Loading method (e.g., pump, forklift)			
Storage location (outdoor, covered)			

Worksheet 6A (page 2 of 5)
Waste Materials Information

Attribute	Description		
Material name	Used brake fluid	Power-steering fluid	Standard transmission fluid
Hazardous ingredients	glycol, glycol ether, heavy metals	solvent dewaxed heavy paraffinic distillate, hydrotreated light naphthenic distillate, trixylenyl phosphate	petroleum hydrocarbons, heavy metals
Hazardous properties	flammable, poisonous, slight skin irritant, eye irritant	flammable, slight skin irritant, eye irritant, poisonous	flammable
Media (gas, liquid, solid)	liquid	liquid	liquid
Fate of waste material (e.g., reuse, off-site disposal, on-site recycling)			
Waste management cost			
Waste shipping mode (e.g., truck)			
Waste shipping container size & type (e.g., 45 gal. drum)			
Loading method (e.g., pump, forklift)			
Storage location (outdoor, covered)			

Worksheet 6A (page 3 of 5)
Waste Materials Information

Attribute	Description		
Material name	Battery acid	Used windshield washer fluid	Windshield washer antifreeze
Hazardous ingredients	Sulfuric acid, heavy metals	methanol	methanol
Hazardous properties	corrosive, vapour harmful, poisonous, eye irritant	flammable, explosive, poisonous, vapour harmful, eye irritant	flammable, explosive, poisonous, eye irritant, slight skin and inhalant irritant
Media (gas, liquid, solid)	liquid	liquid	liquid
Fate of waste material (e.g., reuse, off-site disposal, on-site recycling)			
Waste management cost			
Waste shipping mode (e.g., truck)			
Waste shipping container size & type (e.g., 45 gal. drum)			
Loading method (e.g., pump, forklift)			
Storage location (outdoor, covered)			

Worksheet 6A (page 4 of 5)
Waste Materials Information

Attribute	Description		
Material name	Freon 12 refrigerant	Mercury	
Hazardous ingredients	Dichlorodifluoro-methane	Mercury	
Hazardous properties	toxic combustion products, vapour harmful at high concentrations, may cause frostbite	poisonous	
Media (gas, liquid, solid)	liquified gas	liquid	
Fate of waste material (e.g., reuse, off-site disposal, on-site recycling)			
Waste management cost			
Waste shipping mode (e.g., truck)			
Waste shipping container size & type (e.g., 45 gal. drum)			
Loading method (e.g., pump, forklift)			
Storage location (outdoor, covered)			

Comments: _____

_____

_____

Worksheet 6A (page 5 of 5)
Waste Materials Information

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Attribute	Description		
Material name			
Hazardous ingredients			
Hazardous properties			
Media (gas, liquid, solid)			
Fate of waste material (e.g., reuse, off-site disposal, on-site recycling)			
Waste management cost			
Waste shipping mode (e.g., truck)			
Waste shipping container size & type (e.g., 45 gal. drum)			
Loading method (e.g., pump, forklift)			
Storage location (outdoor, covered)			

Comments: _____

_____

_____

_____

Worksheet 7A (page 1 of 3)
Waste Management Methods

	Special Waste		
Item	Antifreeze	Used oil	Automatic transmission fluid
Storage			
Cost of waste treatment/disposal method			
Recycle/reuse			
Best management			

	Special Waste		
Item	Used brake fluid	Power-steering fluid	Standard transmission fluid
Storage			
Cost of waste treatment/disposal method			
Recycle/reuse			
Best management			

Comments: _____

_____

_____

Worksheet 7A (page 2 of 3)
Waste Management Methods

	Special Waste		
Item	Battery acid	Used windshield-washer fluid	Windshield-washer antifreeze
Storage			
Cost of waste treatment/disposal method			
Recycle/reuse			
Best management			

	Special Waste		
Item	Freon 12 refrigerant	Mercury	
Storage			
Cost of waste treatment/disposal method			
Recycle/reuse			
Best management			

Comments: _____

_____

_____

Worksheet 7A (page 3 of 3)
Waste Management Methods

This page is a blank worksheet for your use.

	Special Waste		
Item			
Storage			
Cost of waste treatment/disposal method			
Recycle/reuse			
Best management			

	Special Waste		
Item			
Storage			
Cost of waste treatment/disposal method			
Recycle/reuse			
Best management			

Comments: _____

_____

_____

Worksheet 8A
Summary of Environmental Review Results (page 1 of 2)

List each area and/or operational practice of your vehicle recycling facility that is not in compliance with the Best Management Practices. The environmental review worksheets (Worksheets 1B-11B), used in the site visit, provide an assessment of compliance with the BMPs and identify target areas for pollution prevention options. This information can be summarized in the following tables, which are titled "(A) General Practices," and "(B) Design and Operational Practices." Enter all information whenever the answer "No" is given to any of the questions in the worksheets included in Appendix B.

(A) General Practices

List identified non-compliance with the BMPs for each of the following general practices: Good Housekeeping, Spill Prevention - Spill Control, and Employee Training (Appendix B).

General Practice	Current Practice	Recommended Practice
example: *Good Housekeeping*	*Disposable rags are used for cleaning.*	*Use reusable rags for cleaning.*

Comments: _____

_____

_____

Worksheet 8A
Summary of Environmental Review Results (page 2 of 2)

(B) Design and Operational Practices

List identified non-compliance with the BMPs for design and operational practices at each vehicle processing area (Worksheets 4B - 11B).

Area of Facility	Current Practice	Recommended Practice
example: *Dismantling pad*	The dismantling pad is not bermed for secondary containment.	*Construct a berm to provide secondary containment..*

Comments: _____
_____
_____

Worksheet 9A
Summary of Identified Pollution Prevention Areas

1. List in order of priority areas which are targets for the pollution prevention program. List the areas where pollution prevention will achieve greatest protection of soil, water, air and/or employee health and safety. List the criteria for ranking each target area.

No.	Target Area or Process	Ranking Criteria
1	***example:*** *dismantling area*	Contamination of soil and stormwater runoff from dismantling area
2		
3		
4		
5		
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8		
9		
10		
11		

Comments: _____

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Worksheet 10A
Pollution Prevention Options

Target Area or Process	Pollution Prevention Options	Anticipated Results
example: dismantling area	construct a permanent roof over the dismantling pad	prevent contaminated runoff from the pad during rain events

Comments: _____

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Worksheet 11A
Rank of Pollution Prevention Options

Target Area	Pollution Prevention Options Screened	Screening Results		Rank
		Cost	Required?*	

*Required means that the pollution prevention option is required by regulations or permit. Please answer with yes or no. If the answer is yes, the option is given first priority.

Comments: _____

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Worksheet 12A:
To Be Implemented

Meeting Date: _____

Meeting Coordinator: _____

Meeting Participants: _____

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Suggested Pollution Prevention Option	Targeted Area	Reasoning for Proposed Option

Worksheet 13A
Three-Year Pollution Prevention Implementation Plan

Develop a schedule for implementing the reduction options selected. Indicate when, in the next three years, the options or phases of options will be implemented.

Pollution Prevention Option	Estimated Implementation Date (month/year)		
	Year 1	Year 2	Year 3
example: roof construction at dismantling area	9/95		
example: installment of closed cycle parts washing system (zero-discharge)		1/96	

Comments: _____

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APPENDIX B

SITE INSPECTION WORKSHEETS

Worksheet 1B (page 1 of 2)
GENERAL: GOOD HOUSEKEEPING

1. Are dirt, sand, and mud kept out of floor drains and gutters by sweeping materials away from drains?	❑ Yes	❑ No
2. Are granular absorbents used sparingly in the cleanup of spills?	❑ Yes	❑ No
3. Are partially soiled rags used before cleaner rags to clean dirty parts, in order to remove excess dirt while minimizing the amount of rags necessary?	❑ Yes	❑ No
4. Is the use of rags, mops, and overalls maximized before being sent to be cleaned?	❑ Yes	❑ No
5. Are damp rags and mops stored in a covered container in order to prevent emissions from evaporation?	❑ Yes	❑ No
6. Are mops used to clean up spills, and then wrung out or centrifuged, thus allowing fluid recovery, recycling, or disposal?	❑ Yes	❑ No
7. Are the rags, mops, overalls, etc., cleaned by an industrial laundry?	❑ Yes	❑ No
8. Are reusable rags used for cleaning?	❑ Yes	❑ No
9. Is the facility free of signs of spills?	❑ Yes	❑ No
10. Are all spills cleaned up immediately?	❑ Yes	❑ No
11. Are all drums and containers covered?	❑ Yes	❑ No
12. Is the site free of ponding surface water?	❑ Yes	❑ No
13. Is the site free of visible signs of contamination running off the site?	❑ Yes	❑ No
14. Are all containers, tanks, and pipes free of leaks and corrosion?	❑ Yes	❑ No

Worksheet 1B (page 2 of 2)
GENERAL: GOOD HOUSEKEEPING

15. Is the site free of smoke, dirt, fumes, or odors which may indicate material loss due to leaks or poorly maintained equipment? ❑ Yes ❑ No

16. Are walls, work surfaces, ceilings, pipes, soil, and concrete free of discolouration which may indicate leaks, overflow, or poorly maintained equipment? ❑ Yes ❑ No

17. Is the site free of visible stains or contamination on the ground (soil or impervious surface)? ❑ Yes ❑ No

18. If no, describe the areas where contamination exists, and check the Best Management Practices (Vol. I) for instructions to rectify the problem.

Contaminated areas:

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Comments: _____

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Worksheet 2B
GENERAL: SPILL PREVENTION - SPILL CONTROL

1. Does the facility have a spill prevention, control, and contingency plan in place? ❑ Yes ❑ No
2. Is spill cleanup equipment (absorbents, containers, shovels, scoops) readily available in areas where spills are most likely to occur, such as:
   - vehicle receiving area? ❑ Yes ❑ No
   - storage areas? ❑ Yes ❑ No
   - fuel removal area? ❑ Yes ❑ No
   - dismantling area? ❑ Yes ❑ No
3. Are spills cleaned up immediately, and prevented from remaining for an extended period of time on the ground? ❑ Yes ❑ No
4. Is safety equipment (including safety boots, gloves and safety glasses) readily available to the employees? ❑ Yes ❑ No
5. Is used absorbent disposed of as special waste? ❑ Yes ❑ No
6. Has an oil spill larger than 100 litres been avoided? ❑ Yes ❑ No
7. If no, was the spill reported to the B.C. Ministry of Environment? ❑ Yes ❑ No
8. Is all vehicle inspection, draining and dismantling confined to the impermeable dismantling pad? ❑ Yes ❑ No
9. Are all drained fluids transferred immediately from drain-pans into the proper storage containers? ❑ Yes ❑ No

Comments: _____

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Worksheet 3B
GENERAL: EMPLOYEE TRAINING

1. Does the facility have certified environmentally trained personnel on staff? How Many?_____ ❑ Yes ❑ No
2. Does the facility conduct employee training annually? ❑ Yes ❑ No
   Does the training include:
   - pollution prevention plan? ❑ Yes ❑ No
   - good housekeeping and preventative maintenance? ❑ Yes ❑ No
   - spill response and reporting procedures? ❑ Yes ❑ No
   - environmentally acceptable special waste handling procedures? ❑ Yes ❑ No
   - dangers of hazardous materials handled on-site (Material Safety Data Sheets) ❑ Yes ❑ No

Comments: _____

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Worksheet 4B
VEHICLE RECEIVING AREA

1. Does the vehicle receiving area have some form of spill containment?	❑ Yes	❑ No
2. Is there spill control equipment?	❑ Yes	❑ No
3. Are incoming vehicles inspected immediately for leaks from engines, radiators, transmissions, fuel tanks and damaged areas?	❑ Yes	❑ No
4. If there are any leaks, is the vehicle moved to the dismantling area for the removal of fluids from leaking components, or have drip-pans or other spill control equipment been placed under the vehicle?	❑ Yes	❑ No
5. Are leaked fluids from vehicles in the holding areas cleaned up immediately?	❑ Yes	❑ No
6. Are all parts containing liquid left in the vehicle while it is still in the receiving area?	❑ Yes	❑ No

Comments: _____

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Worksheet 5B (page 1 of 3)
DISMANTLING AREA

1. Is the dismantling area a confined pad made of impervious material?	❑ Yes	❑ No
2. Is the floor of the dismantling pad free of any cracks?	❑ Yes	❑ No
3. Is the dismantling area in an enclosed building, or covered by a roof?	❑ Yes	❑ No
4. If covered by a roof, is the roof of sufficient size to prevent rainfall or snow from reaching the dismantling pad?	❑ Yes	❑ No
5. Is there is a secondary spill containment area which can hold the larger of: 110% of the largest volume of liquid waste in any given container, or 25% of the total volume of liquid waste stored in the dismantling area?	❑ Yes	❑ No
6. Is the dismantling pad high enough to prevent flooding by surface runoff from surrounding areas?	❑ Yes	❑ No
7. Are the following parts drained?		
• air-conditioning unit	❑ Yes	❑ No
• fuel tank	❑ Yes	❑ No
• engine	❑ Yes	❑ No
• transmission	❑ Yes	❑ No
• radiator	❑ Yes	❑ No
• window-washing fluid tank	❑ Yes	❑ No
• differential	❑ Yes	❑ No
• torque converter	❑ Yes	❑ No
• centre section rear-end	❑ Yes	❑ No
8. When draining fluids, are drip-pans kept under the vehicle while hoses are unclipped?	❑ Yes	❑ No
9. Are the drip-pans leak-proof and uncracked?	❑ Yes	❑ No
10. Are all rubber hoses plugged after draining?	❑ Yes	❑ No

Worksheet 5B (page 2 of 3)
DISMANTLING AREA

11. Are all metal fluid lines crimped after draining?	❑ Yes	❑ No
12. Are dirty parts placed in drip-pans after removal, instead of on the floor?	❑ Yes	❑ No

Engine

13. Are engines drained by removing the drain plugs (i.e., and not by punching holes in the oil pan)?	❑ Yes	❑ No
14. When draining the engine, is the oil filter removed and drained?	❑ Yes	❑ No

Transmission

15. Is the transmission drained by removing the plug, the oil pan, or by drilling a hole in the pan?	❑ Yes	❑ No
16. Are all holes in the transmission sealed after draining?	❑ Yes	❑ No
17. Is the dipstick left in the transmission, or replaced with a plug?	❑ Yes	❑ No
18. Are drive-shaft yokes left on the transmission?	❑ Yes	❑ No
19. After oil removal, are all bolts tightened on the oil pan of the transmission?	❑ Yes	❑ No

Gas Tanks

20. Are gas tanks crushed or rendered explosion-proof using a non-spark-producing tool before they are sent to the shredder?	❑ Yes	❑ No

Radiators

21. Is antifreeze drained from the radiator?	❑ Yes	❑ No
22. Are iron parts removed from radiator for separate recycling?	❑ Yes	❑ No

Worksheet 5B (page 3 of 3)
DISMANTLING AREA

23. When iron parts are being are removed from the radiator, are cutting torches used in a well ventilated area? ❑ Yes ❑ No

24. Is respiratory protection, such as a filtering mask, worn to reduce the risk of breathing airborne lead? ❑ Yes ❑ No

25. Are used radiators recycled regularly? ❑ Yes ❑ No

Airbags

26. Are all undeployed airbags removed by a trained technician? ❑ Yes ❑ No

Comments: _____

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Worksheet 6B
VEHICLE CRUSHING

1. Is a crusher with internal fluid collection system used?	❑ Yes	❑ No
2. If no, is the crusher placed above drip-pans?	❑ Yes	❑ No
3. Is the crusher placed on an impermeable surface?	❑ Yes	❑ No
4. Are the following waste fluids drained before crushing?		
• engine oil?	❑ Yes	❑ No
• oil from oil filter?	❑ Yes	❑ No
• transmission fluid?	❑ Yes	❑ No
• power-steering fluid?	❑ Yes	❑ No
• fuel?	❑ Yes	❑ No
• coolant?	❑ Yes	❑ No
• rear differential fluid, if accessible?	❑ Yes	❑ No
• refrigerant?	❑ Yes	❑ No
• brake fluid from master cylinder?	❑ Yes	❑ No
5. Are all spills cleaned up as soon as they occur?	❑ Yes	❑ No
6. Is the crusher operation area checked for any fluid releases after crushing is complete?	❑ Yes	❑ No
7. Are any releases promptly cleaned up, and contaminated material disposed of, as required by regulations?	❑ Yes	❑ No
8. Are crusher drains kept clean, and the residue disposed of?	❑ Yes	❑ No
9. Is the crusher kept in a designated area in order to localize potential contamination?	❑ Yes	❑ No
10. Are batteries removed before crushing?	❑ Yes	❑ No
11. Are mercury switches removed before crushing?	❑ Yes	❑ No

Worksheet 7B (page 1 of 2)
PARTS CLEANING

1. Is caked-on grease and oil removed from parts with a scraper or a knife before washing? ❑ Yes ❑ No

Pressure/Steam Cleaning

2. If a pressure or steam cleaning system is used, is a zero-discharge recycling system in place? ❑ Yes ❑ No

If no, answer questions 3 through 8:

3. Is the wastewater collected for treatment? ❑ Yes ❑ No

4. Is there an oil trap to remove oil from the wastewater before discharge? ❑ Yes ❑ No

5. If wastewater is discharged into the sewers, has a permit for discharge been obtained? ❑ Yes ❑ No

6. Does the effluent quality meet the permit requirements? ❑ Yes ❑ No

7. Is the facility in compliance with the terms of the permit? ❑ Yes ❑ No

8. Is the oil-water separator, or the settling/detention basin kept free of debris or sludge accumulation? ❑ Yes ❑ No

Solvent-Based Cleaning System

9. Is the solvent-based cleaning system and solvent containers placed on an impervious floor with spill containment and spill control? ❑ Yes ❑ No

10. Is the solvent reused and recycled? ❑ Yes ❑ No

11. Are dirty parts pre-washed in partially-spent solvent? ❑ Yes ❑ No

Worksheet 7B (page 2 of 2)
PARTS CLEANING

12. Are sinks and dip tanks or solvent buckets placed in convenient locations in order to prevent solvents from dripping onto the floor, and to prevent accidental spillage?	❑ Yes	❑ No
13. Is solvent drained from parts before they are removed from the parts washer?	❑ Yes	❑ No
14. Are drip-trays or racks used to drain cleaned parts?	❑ Yes	❑ No
15. Are solvent storage containers labeled with content, amount, and accumulation start date?	❑ Yes	❑ No
16. Are cleaning solvents recycled with a licenced waste management company?	❑ Yes	❑ No
17. Are solvent-soaked rags kept in a covered container for reuse?	❑ Yes	❑ No

Comments: _____

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Worksheet 8B
PARTS STORAGE AREA

1. Are fluid-containing parts stored inside a building? ❑ Yes ❑ No

2. Are fluid-containing parts stored under a permanent roof (i.e., not a tarp)? ❑ Yes ❑ No

3. Are the following fluid-containing parts stored on an impermeable surface with spill controls?

   - engines? ❑ Yes ❑ No
   - transmissions? ❑ Yes ❑ No
   - radiators? ❑ Yes ❑ No
   - differentials? ❑ Yes ❑ No
   - fuel tanks? ❑ Yes ❑ No

4. Does the parts storage area have secondary spill containment? ❑ Yes ❑ No

5. Are all oil-containing parts in the facility (except hulks) protected from exposure to rain? ❑ Yes ❑ No

6. Are fluids prevented from discharging from the parts storage area to adjacent soils? ❑ Yes ❑ No

Comments: _____

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Worksheet 9B
HULK STORAGE AREA

1. Are all fluids drained before the vehicle is transferred to the hulk storage area?	❑ Yes	❑ No
2. Are all fluid-containing parts removed before the vehicle is transferred to the hulk storage area?	❑ Yes	❑ No
3. Are batteries removed before the vehicle is transferred to the hulk storage area?	❑ Yes	❑ No
4. Are oil filters removed and drained before being sent to the steel recycler?	❑ Yes	❑ No
5. Is the hulk storage area free of any discolouration of soils?	❑ Yes	❑ No

Comments: _____

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Worksheet 10B (page 1 of 4)

LIQUID WASTE HANDLING

1. Are above-ground storage tanks used for all fluids (including fuel)?	❑ Yes	❑ No
2. If underground tanks are used for fluid storage, are they monitored for detection of leaks?	❑ Yes	❑ No
3. Are fluids stored in steel or plastic drums up to 45 gallons in capacity, or in other reusable containers that are rigid and durable, corrosion-resistant, non-leaking, non-absorbent, and have a close-fitting cover?	❑ Yes	❑ No
4. If fluid storage containers are not stored inside a building, are they protected sufficiently from rain and snowfall by a permanent roof (i.e., not a tarp)?	❑ Yes	❑ No
5. Are storage drums spaced apart so they may be inspected visually for leaks or corrosion?	❑ Yes	❑ No
6. Are storage tanks surrounded by secondary containment, or are double-walled storage tanks used?	❑ Yes	❑ No
7. Is the surface of the secondary containment area impervious?	❑ Yes	❑ No
8. Can the secondary containment around the fluid storage area contain the greater of 25% of the total enclosed tank volume, or 110% of the volume contained in the largest tank?	❑ Yes	❑ No
9. Are non-compatible chemicals stored in separate designated secured areas?	❑ Yes	❑ No
10. Are metal drums stored on pallets to protect from corrosion?	❑ Yes	❑ No
11. Are fuels stored separately from the other fluids?	❑ Yes	❑ No
12. Is each container labeled as to its content and potential hazards?	❑ Yes	❑ No

Worksheet 10B (page 2 of 4)

LIQUID WASTE HANDLING

13. Are accumulation start dates recorded on all fluid storage containers? ❑ Yes ❑ No

14. Is the quantity of fluid stored on the facility site known for any given point in time? ❑ Yes ❑ No

15. Are the fluids recycled on a regular basis to avoid allowing unnecessarily large amounts of fluid from accumulating? ❑ Yes ❑ No

16. Are funnels removed from fluid storage drums or tanks once fluid transfer has been completed? ❑ Yes ❑ No

Used Oils

17. Are used oils (engine, transmission, differential, power-steering, transaxle) stored separately from other fluids such as antifreeze, brake fluid, etc.? ❑ Yes ❑ No

18. Are less than 5,000 litres of used oil handled or stored within a 30-day period? ❑ Yes ❑ No

19. If no, has a Generator Registration Report been filed, and has a Consignor Identification Number been applied for? ❑ Yes ❑ No

20. Are less than 50,000 litres of used oil stored at any given point in time? ❑ Yes ❑ No

21. If no, and if the period of storage of over 50,000 litres of used oil is less than 14 days, has a Generator Registration Report been filed? ❑ Yes ❑ No

22. If the period of storage of over 50,000 litres of used oil is over 14 days, has a short-term Storage Permit been applied for? ❑ Yes ❑ No

23. Are all loads of used oil to be transported in quantities of less than 205 litres (45 gallons) under all circumstances? ❑ Yes ❑ No

Worksheet 10B (page 3 of 4)

LIQUID WASTE HANDLING

24. If no, is a manifest obtained for any transported loads of used oil?	❑ Yes	❑ No
25. Are copies of manifests kept on file?	❑ Yes	❑ No

Antifreeze

26. Is reusable antifreeze stored separately from waste antifreeze?	❑ Yes	❑ No
27. Is reusable antifreeze used in vehicles and machinery on-site?	❑ Yes	❑ No
28. Is waste antifreeze recycled by distillation, ion exchange, filtration, or an approved antifreeze recycling service?	❑ Yes	❑ No
29. Are less than 100 litres of used antifreeze handled or stored within a 30-day period?	❑ Yes	❑ No
30. If no, has a Generator Registration Report been filed, and has a Consignor Identification Number been applied for?	❑ Yes	❑ No
31. Are less than 1,000 litres of used antifreeze stored at any given point in time?	❑ Yes	❑ No
32. If no, and if the period of storage of over 1,000 litres of used antifreeze is less than 14 days, has the facility made a Generator Registration Report?	❑ Yes	❑ No
33. If the period of storage of more than 1,000 litres of used antifreeze is over 14 days, has a Temporary Storage Permit been applied for?	❑ Yes	❑ No

Fuel

34. Are fuel storage containers inspected weekly?	❑ Yes	❑ No
35. Are there separate storage containers for useable fuel and waste fuel?	❑ Yes	❑ No

Worksheet 10B (page 4 of 4)
LIQUID WASTE HANDLING

36. Is waste fuel recycled with a special waste hauler?	❑ Yes	❑ No
37. Is reclaimed, usable fuel utilized in facility vehicles?	❑ Yes	❑ No
38. Is diesel fuel stored separately from gasoline?	❑ Yes	❑ No
39. Is fuel siphoned directly from vehicles into facility vehicles using an air-driven pump, a hand pump, or a gas buggy, and fuel only moved to storage when facility vehicles are full?	❑ Yes	❑ No
40. Is fuel removed from the fuel tanks at the dismantling pad?	❑ Yes	❑ No

Refrigerant

41. Is air-conditioning refrigerant recovered by a licensed company, or trained personnel and approved equipment?	❑ Yes	❑ No

Brake Fluid

42. Is brake fluid evacuated from the master cylinder?	❑ Yes	❑ No
43. Are the openings and brake lines clamped off or sealed in order to prevent spillage?	❑ Yes	❑ No

Windshield-Washing Fluid

44. Is windshield-washing fluid stored in separate containers from other fluids until it is reused or given away?	❑ Yes	❑ No

Comments: _____

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Worksheet 11B (page 1 of 3)

SOLID WASTE HANDLING

1. Are the solid waste containers and secondary containment for storing parts containing fluids durable, corrosion-resistant, and non-absorbing?	❑ Yes	❑ No
2. Are dumpsters and drop-boxes kept covered except for when material is being put in?	❑ Yes	❑ No

Oil Filters

3. Are oil filters removed from engine?	❑ Yes	❑ No
4. Are oil filters drained for 12 to 24 hours before disposal?	❑ Yes	❑ No
5. Are drained oil filters recycled with a scrap metal recycling facility?	❑ Yes	❑ No

Lead-Acid Batteries

6. Are all batteries removed from the vehicle before crushing?	❑ Yes	❑ No
7. Are batteries tested to determine usability or resale quality?	❑ Yes	❑ No
8. Are unusable batteries recycled with a licensed battery recycling facility?	❑ Yes	❑ No
9. Are recycling documents kept on file?	❑ Yes	❑ No
10. Are lead cable ends removed from reusable batteries that are being resold?	❑ Yes	❑ No
11. Are leaking or cracked batteries stored in a leak-proof container, or on a curbed, impermeable surface with spill controls?	❑ Yes	❑ No
12. Are batteries stored indoors or in a closed container, protected from rain and snow?	❑ Yes	❑ No

Worksheet 11B (page 2 of 3)
SOLID WASTE HANDLING

Are batteries stored on an acid-resistant, impermeable surface such as:

13. Fiberglass or plastic boxes made specifically for battery storage	❑ Yes	❑ No
14. A curbed, impermeable asphalt or concrete surface coated with heavy acid-resistant epoxy, fiberglass, or lined with heavy plastic?	❑ Yes	❑ No
15. Polypropylene cement-mixing tubs?	❑ Yes	❑ No
16. Are battery storage containers free of any cracks?	❑ Yes	❑ No
17. Are storage containers and cover materials inspected weekly?	❑ Yes	❑ No
18. Is an absorbent kept in the bottom of battery storage boxes?	❑ Yes	❑ No
19. Are all batteries stored in an upright position?	❑ Yes	❑ No
20. Are less than 2,000 kg of batteries collected within 30 days, or stored at any one time for recycling?	❑ Yes	❑ No
21. If no, has a Consignor Identification Number been obtained?	❑ Yes	❑ No
22. Are less than 10,000 kg of batteries stored at any one time?	❑ Yes	❑ No
23. If no, and if the storage period of over 10,000 kg of batteries is less than 14 days, has a Generator Registration Report been made?	❑ Yes	❑ No
24. If the storage period of over 10,000 kg of batteries is more than 14 days, has a short-term storage permit been applied for?	❑ Yes	❑ No
25. Are less than 1,000 kg batteries transported at any one time?	❑ Yes	❑ No
26. If no, has a manifest from MOELP been obtained for each shipment?	❑ Yes	❑ No

Worksheet 11B (page 3 of 3)
SOLID WASTE HANDLING

27. Do you keep a copy of all manifests on file? ❑ Yes ❑ No

Lead Parts

28. Are lead tire weights and battery cable ends removed before crushing vehicles? ❑ Yes ❑ No

29. Are lead parts recycled with a metals or battery recycler? ❑ Yes ❑ No

30. Are lead parts stored in a covered container that is capable of handling the excessive weight of lead? ❑ Yes ❑ No

Mercury Switches

31. Are all mercury switches removed from vehicle hoods and trunks? ❑ Yes ❑ No

32. Are mercury switches stored in a leak-proof, closed container? ❑ Yes ❑ No

33. Are all mercury capsules in the storage containers unbroken? ❑ Yes ❑ No

34. Is there a mercury cleanup kit accessible? ❑ Yes ❑ No

35. Are mercury switches reused? ❑ Yes ❑ No

36. If no, are mercury switches recycled with a licensed metal recycler that reclaims mercury? ❑ Yes ❑ No

Waste Tires

37. Are non-reusable waste tires recycled regularly? ❑ Yes ❑ No

38. Are waste tires transported to a permitted waste tire processor? ❑ Yes ❑ No

Comments: _____

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CODE OF PRACTICE

FOR
THE AUTO RECYCLING INDUSTRY
IN BRITISH COLUMBIA

(VOLUME III)

BY

EL-RAYES ENVIRONMENTAL CORP.
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March 15, 1996
File No. 952-61

NOTICE

This project was funded by Environment Canada under the Fraser River Action Plan through its Fraser River Pollution Abatement Office. Funds were also provided by the Ministry of Environment, Lands and Parks (MOELP), B.C. Ministry of Transportation, and the Insurance Corporation of British Columbia.

The reports for this project consist of three volumes, including the Best Management Practices, Technical Pollution Prevention Guide, and Code of Practice for the Auto Recyclers.

The reports have been subjected to Environment Canada and MOELP peer review, and has been approved for publication.

The documents are intended as advisory guidance to auto recyclers in British Columbia in developing approaches to pollution prevention. Compliance with occupational safety and health laws is the responsibility of each individual business, and is not the focus of these documents.

Any comments regarding these documents should be forwarded to :

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A copy of the comments may be sent to:

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Environment Canada
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V7M 3H7

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Mr. Mario Pavlakovic
Mr. Ed Tretwold
Mr. Ed Wasney
Mr. Jerry Abramson
Mr. Brad Campbell
Mr. Rob Fordyce
Mr. Derrik Robertson
Mr. Veer Dharney
Mr. Al Vaughan

EXECUTIVE SUMMARY

The objective of this project was to provide the auto recycling industry in British Columbia with a guide for pollution control. The resulting documents are presented in three volumes:

Volume I Best Management Practices
Volume II Technical Pollution Prevention Guide
Volume III Code of Practice for the Auto Recycling Industry in B.C.

Each volume is prepared as a stand-alone document. As a result, there is some repetition in each volume regarding the industry profile, waste management methods, and regulations.

Volume I, Best Management Practices, comprises four parts: a review of the current environmental management practices; technologies used in B.C. to recycle special wastes relating to the auto recycling industry; a list of licensed special waste transporters in B.C.; and the best management practices for the industry.

To review current environmental management practices and vehicle processing procedure, six auto recycling facilities located in the Lower Fraser Valley were assessed. Practices impacting on the environment were identified, and environmental training requirements for the operators were determined.

The second section reviews technologies available in B.C. for recycling special wastes from vehicles such as used oils, oil filters, antifreeze, and acid batteries. A list of companies which process these wastes is provided in Appendix I.

The third section presents environmental best management practices (BMPs) for auto recycling facilities. BMPs are designed to provide auto recyclers with an economically feasible approach to managing special wastes in the facility. The first part of Section 3 addresses the physical and structural design requirements for the auto recycling facility. The second part covers proper procedure to manage special waste.

Volume II, Technical Pollution Prevention Guide, provides auto recyclers with a step-by-step procedure to conduct an environmental site assessment, to check compliance with the BMPs, and to help the operator develop a pollution prevention plan.

This guide also includes the British Columbia Auto Recyclers' management policy statement, a profile of the auto recycling industry in B.C., waste management practices, environmental regulations, and employee training.

Volume III, the Code of Practice for the Auto Recyclers in British Columbia, comprises a brief review of the auto recycling industries in the province, the environmental regulations governing their operation, and the Code of Practice for the industry to conduct an

environmentally sound operation. The Code of Practice includes both facility design and operational requirements. It also provides the permitting agency with the inspection procedures. The document could be used by MOELP for exempting auto recyclers from section 3 (1.1) and (1.2) of the Waste Management Act. This would lower ministry costs incurred through enforcement of the Waste Management Act.

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1.0 INTRODUCTION

1.1 Background

Auto recycling contributes significantly to sustaining the environment by saving energy and materials which may have been consumed to produce new parts. However, the dismantling of automobiles involves handling a significant quantity of hazardous materials, including: fuels, engine oil, oil filters, transmission fluids, antifreeze, brake fluids, refrigerants, mercury switches, power-steering fluids, shop rags, and lead-acid batteries.

To protect the environment, it is important that all end-of-life vehicles be processed properly, whether by a steel recycler or auto recycler, before final disposal. British Columbia Auto Recyclers (B-CAR) is aware that for the vehicle recycling industry to fulfill their mission in B.C., it is necessary to use environmentally sound procedures in recycling facilities.

1.2 Objectives

This document presents a code of practice for auto recyclers so that special wastes are handled in an environmentally sound manner. It also helps the permitting agencies to review activities at the facility to determine adverse impact on the environment. This document could provide an agency with guidelines for inspection procedures for future licensing purposes.

This document could be used by the Ministry of Environment, Lands and Parks (MOELP) for exempting the automobile recyclers from sections 3(1.1) and (1.2) of the Waste Management Act, as practiced with the Agricultural Operations (Waste Management Act, Health Act, Agricultural Waste Control Regulations), which cover handling and release of special wastes into the environment.

1.3 Commitment of the Industry

B-CAR is committed to excellence and leadership in protecting the environment.
Consistent with this policy, B-CAR shall:

- adopt safe work practices, and comply with environmental conservation procedures in order to continually improve operations beyond minimum acceptable environmental standards;
- comply with all legal requirements which affect their operations;
- ensure that B-CAR operations do not present an unacceptable level of risk to their employees, customers, the public, or the environment;
- handle and dispose of special wastes in a safe manner; and,

- work actively with and assist governments and other organizations to encourage equitable and attainable environmental standards.

2.0 INDUSTRY PROFILE

2.1 Industry Description

Approximately 100,000 automobiles are taken off the road annually in British Columbia. Thirty percent of these vehicles have been involved in accidents and declared unrepairable by the Insurance Corporation of British Columbia; others are aging vehicles that do not justify further repair.

The automobile recycling industry has been dismantling and reclaiming significant amounts of materials for over 75 years. In British Columbia, there are currently 146 active automobile dismantling facilities.

In 1961, an association for this industry started as a division of the Automobile Retailers Association (Auto Wreckers Division). In June 1965, the Auto Wreckers and the Truck Parts Division were amalgamated to form the Used Auto and Truck Parts Division to work with the government to improve the appearance of used parts premises. In 1989, the name was changed to B.C. Auto Recyclers (B-CAR). Currently B-CAR has 79 members.

2.2 Process Description

The following section provides a general description of vehicle dismantling, special waste, and parts handling processes in the auto recycling facilities. A more detailed description is provided in Volume I. The dismantling processes may vary at each facility depending on the type, age, and condition of the vehicles handled.

Most auto recyclers obtain the majority of their vehicles from the Insurance Corporation of British Columbia (ICBC). In general, vehicles are tested prior to dismantling to determine the condition of the engine and other motorized parts.

Fluids and other wastes are drained in the dismantling area. Parts, tires, and batteries are removed for resale or for their scrap value. The dismantling area also serves as a central waste collection area, and ideally would be located close to storage areas for wastes and recyclable materials. A properly designed dismantling area prevents fluids contaminating stormwater and soil, and contains any spills which may occur.

After draining the fluids, the engine, transmission, radiator, gas tank, motorized electrical parts, lamps, doors, seats, exhaust systems, hoods and trunk lids, shocks, steering, and rear ends may be removed while the vehicle is at the dismantling pad. The remaining parts may be left on the hulk, which is then sent to the hulk storage area.

After a storage period, the vehicle may be crushed for steel recycling. Some facilities have the crusher on-site; others may haul the vehicles to a steel recycling facility without being crushed.

Parts removed during dismantling undergo different procedures, depending on the facility. Usually, valuable parts which are in high demand are removed, cleaned, and then stored. Resale parts are cleaned using a variety of cleaning systems including solvent-based, steam, or high-pressure water cleaning. The solvent-based cleaning system is most commonly used and consists of a solvent tank and a recirculation pump, which allows the part to be cleaned with a stream of solvent. The systems are commercially serviced on a contract basis by a special waste management company.

In steam or pressure cleaning, a closed circuit (with no discharge to the sewers) may be used, or an oil separator may be used to remove oils from the wastewater before it is discharged to the sanitary sewers.

2.3 Waste Management Methods

At vehicle recycling facilities, materials which may become special wastes include:

- fuels (gasoline and diesel);
- motor oil;
- transmission fluid;
- oil filters;
- antifreeze (ethylene glycol);
- batteries (lead and sulfuric acid) and lead parts;
- spent cleaning solvents (light hydrocarbons, e.g., Varsol, Naphtha);
- mercury switches;
- brake fluid (glycols);
- refrigerants;
- power-steering fluid;
- general lubricants; and,
- airbags.

These materials may be reused, recycled, or disposed of. Refrigerants are usually removed from the air-conditioning system by a contractor. Other special wastes and fuels are removed during the dismantling process.

Leaks or spills from vehicle parts represent the major contaminant threat due to their high degree of mobility and difficulty in handling.

Storage methods for liquid wastes may vary from site to site. Some facilities use 200-litre drums or smaller containers. The containers must be covered, provided with secondary containment for spill control, and protected from weather or vehicular damage. The

facility may plan to have a central liquid storage area covered with a roof, or inside a building. Labeling and proper sealing of fluid containers must be observed.

The following section briefly describes the handling procedure for various wastes generated by the facility.

i) Fuels

Fuels, including gasoline and diesel fuel, are typically a valuable commodity to the facility. Usually the fuel is drained into containers and/or directly transferred to motor-operated equipment on-site.

ii) Used Oil and Oil Filters

Used oil may include motor oil, transmission oil, power-steering fluid, and differential fluids. The oils are drained on the dismantling pad into a container and transferred to a storage vessel.

Both motor oil and transmission oil are collected at all sites by a licensed special waste transporter. The Waste Management Act (Special Waste Regulation) specifies conditions for storage of special wastes with regard to storage quantities and secondary containment. In addition, permits and manifests may be required for storage and transportation, respectively.

Oil filters are drained and either crushed with the vehicle, or removed with the engine and sent to scrap metal dealers.

iii) Antifreeze

The recovered antifreeze is stored and either reused on-site, recycled on-site, or disposed of as special waste by a special waste management company.

iv) Refrigerant

Refrigerant used in vehicle air-conditioning systems was R12 which is an ozone-depleting chemical. The production and use of R12 is being phased out.

The refrigerant is removed from the vehicle before dismantling and/or crushing. The equipment used in removing the refrigerant must meet the standards set by the Canadian Environmental Protection Act (CEPA).

v) Brake Fluid

Master cylinder brake fluid is drained and recycled.

vi) Batteries

Batteries are removed during the dismantling process. Depending on the testing results, batteries are either stored for resale or for recycling.

The batteries are stored in a covered storage area using an impervious plastic container in order to keep spilled battery acid from corroding metal, concrete, or other surfaces. Improper storage may eventually lead to contamination of soil and groundwater.

vii) Tires

Tires represent a sizable waste stream to the average facility, as well as a significant resource. It is reported that a good proportion of tires are sold. Old or damaged tires are disposed of by a disposal agent.

viii) Mercury Switches

Mercury is a persistent environmental contaminant which is toxic to plants and animals, and can accumulate in the food chain. Mercury light switches are located under the hoods or in the trunks of some makes and models of vehicles. Mercury from the switches may be released into the environment when the vehicle is crushed, or when the crushed hulk is shredded at a metal recycling facility.

Mercury switches are removed either for resale, or for recycling by a licensed special waste management company. The switches are stored in sealed containers.

ix) Spent Cleaning Solvents

Generally, degreasing solvents are provided by a contractor who collects the spent solvents for recycling.

2.4 Regulatory Requirements

This section summarizes the B.C. special waste regulations concerning discharges into the environment and spill reporting, as well as registration, storage, and transportation of special waste.

2.4.1 Discharge into the Environment

According to section 3 of the Waste Management Act, “No person shall, in the course of conducting an industry, trade, or business, introduce, cause, or allow waste to be introduced into the environment.” In simpler words, no one may pollute the environment through running a business. The Act also prohibits the introduction of waste into the environment in such a manner or quantity as to cause pollution, “except as permitted, approved, or according to an order, regulation, or a waste management plan approved by the minister.” Again, in simpler words, you need a special government permit to pollute, and that permit will require strict controls.

2.4.2 Spills Reporting

According to section 10 of the Waste Management Act, if a spill occurs in a quantity equal to or greater than that listed in Table 1 (column 4), the person in possession of the substance immediately before the spill shall report the spill to the Pollution Emergency Program at 1-800-663-3456 or (604) 387-5956 in Victoria, or to the local police or RCMP. As a result, MOELP may take actions, including constructing containment structures, and conduct investigations at the expense of that person.

2.4.3 Registration of Special Waste

The Special Waste Regulation (section 43) requires registration of facilities which, within a thirty-day period, handle quantities of special wastes greater than in Table 1 (column 2). These facilities must make a Generator Registration Report, and must apply for a Consignor Identification Number with the Director, Industrial Waste and Hazardous Contaminants Branch, or with a Regional Environmental Protection Manager of the MOELP.

Facilities which handle registerable quantities of special wastes, but treat or dispose of them immediately, are still required to register the wastes. However, facilities which recycle the special wastes on the site where they generate them, and do not store them for a time exceeding 14 days before they recycle them, are not required to register their special wastes.

2.4.4 Storage

The Waste Management Act prohibits storage of more than a specific amount of special waste unless special approval or a permit has been given. These amounts are shown in Table 1 (column 2).

Facilities storing larger amounts than these are required to make a Generator Registration Report with the Director, Industrial Waste and Hazardous Contaminants Branch, and apply for a Consignor Identification Number, as required by the Special Waste Regulation (Section 43).

Facilities which, for a period longer than 14 days, store more special waste than the amounts listed in Table 1 (column 3) are also required to apply for a Storage Permit, according to the Waste Management Act (section 4), and the Special Waste Regulation (section 48).

Table 1: Generator Registration, Storage Permit, and Reportable Spill Quantities

Column 1 Waste Classification or Name	**Column 2** Registration Quantity (kg or litre, as appropriate)	**Column 3** Storage Permit Quantities (kg or litre, as appropriate)	**Column 4** Reportable Spill Quantities (kg or litre, as appropriate)
R12, Dichlorodifluoro-methane (2.2)**	1,000*	10,000*	10
Gasoline (3.1)**	100	1,000	100
Antifreeze (6.1)**	100	1,000	5
Waste oil or waste oil contaminated with lead	5,000	50,000	100
Mercury	100	1,000	5 kg
Waste batteries	2,000	10,000	N/A

*total liquid volume capacity of containers; however, tanks should only be filled to 80% of rated volume at 21°C.

**Class according to the Transportation of Dangerous Goods Regulation

The Special Waste Regulation (section 50.4) bans storage of incompatible special wastes in one container. Incompatible materials are those that if stored together under normal conditions of storage or transportation will produce heat, a gas, a corrosive substance, or a toxic substance. Also, containers must be kept closed at all times other than for filling, transferring, or emptying materials, and the containers must be handled in such a way so as not to cause them to leak or rupture.

2.4.5 Transportation

The Waste Management Act (section 5) requires that, for transportation of special wastes, if the quantity of special waste is greater than the amounts shown in Table 1 (column 2), a manifest must accompany the shipment, and the carrier must be licenced.

Any person offering for transport a quantity of special waste in excess of that shown in Table 1 (column 2) must obtain a Consignor Identification Number, as required by the Special Waste Regulation (section 44).

Any shipment of special waste in excess of 5 kg of solids, or 5 liters of liquid or gas, must be accompanied by a manifest, as required by the Special Waste Regulation (Section 46). However, waste oil, and batteries may be transported in greater quantities without a manifest, if the quantities are less than 205 liters and 1,000 kg, respectively.

A manifest is not required for transportation of special waste on public roads if the transport distance is less than 1 km, or if the distance is less than 100 km within the boundaries of the generator's owned, leased, or controlled property.

For loads requiring a manifest, carriers of special wastes must have a transport license issued by the Director, Industrial Waste and Hazardous Contaminants Branch (Special Waste Regulations, section 45).

3.0 THE CODE OF PRACTICE FOR AUTO RECYCLERS

Part 1: Purpose

(a) The purpose of the Code of Practice for the auto recycling industry in British Columbia is to set design requirements and operating standards which will result in the handling of special waste in an environmentally sound manner.

Part 2: Interpretation

In this code:

"Core" means a vehicle part that has value to a parts re-manufacturer.

"Crusher" means a mechanical device which reduces the volume of vehicle hulks prior to transportation. It can be either mobile or stationary.

"Dismantling area" means the area where fluid drainage, testing, and dismantling of a vehicle is done.

"Fluid Storage Area" means the area(s) where solvents and other liquid chemicals, liquid wastes, and/or fluids from vehicles are stored prior to use, resale, recycling, treatment, or disposal.

"Hulk Storage Area" means an outdoor area on a pervious surface (liquids can drain or seep through it) where vehicles in various stages of dismantling are stored.

"Part" means a vehicle part that can be resold for reuse or rebuilt.

"Parts Cleaning System" means any system for the removal of heavy grease and oil. System can include manual cleaning, solvent-based systems, pressure washing, and steam cleaners.

"Scrap Part" is a vehicle part that is sorted by metal type and sent to a scrap recycler to be baled and melted down.

"Used Oils" includes, but is not limited to: motor oil, transmission fluid, differential oil, power-steering fluid, and transaxle fluid.

"Vehicle Crusher Area" means the area where the crusher is located.

"Vehicle Receiving Area" means the area where a wrecked or used vehicle could be temporarily stored prior to the dismantling of any mechanical or body part, or transfer to the hulk storage.

"Waste Fluids" includes, but is not limited to: used oils, transmission oil, antifreeze, refrigerant, and brake fluid.

Part 3: General

General guidelines applicable for the vehicle recycling facility:

3.1 Spill Prevention-Spill Control

(a) Spill prevention-spill control must be exercised to prevent waste fluids from contaminating the surrounding soil, air, groundwater, or stormwater runoff.

(b) The facility must provide:

- safety equipment for employees, including gloves and safety glasses;
- absorbent material for soaking up oils and solvents: rags, towels, pads, booms and organic absorbents, such as lime (for battery acid) and sawdust;
- containers to hold spilled waste such as drip-pans, pails, and drums;
- shovels and scoops to pick up organic cleanup materials; and,
- industrial spill cleanup products sold specifically for absorbing oil and solvents.

Cleanup equipment must be easily accessible throughout the facility. Each automotive recycling yard must have a minimum of one emergency spill control kit on-site.

3.2 Oil-Water Separator for Liquid Discharges

A zero-discharge recycling system is the best method for wastewater management.

Using a treatment system with disposal to the municipal sewer system is acceptable providing that permit requirements for wastewater discharges are met.

3.3 Good Housekeeping - Preventative Maintenance

(a) Pollutant fluid, fuel leaks, and spills on any soil or paved area must be cleaned up immediately. Soil can be cleaned up by removal, disposal, or treatment.

(b) Debris and sludge must be removed from all treatment systems, such as settling basins and oil-water separators, and properly disposed of as a special waste.

(c) Accumulated oil must be removed from oil-water separators, and from all other oil containment and removal systems to ensure the operational efficiency of these systems is maintained. This must be done as required.

(d) Cracked or damaged paved process areas and other impervious containment areas must be repaired immediately.

(e) Direct discharge of liquid pollutants to storm, ground, or surface waters must be prevented.

(f) Fluids from vehicles and parts must be transferred to covered storage tanks with secondary containment.

(g) Impervious containment areas must be chemically resistant to gasoline, diesel fuel, crankcase oil, transmission fluid, and all the other pollutant fluids that could be spilled or leaked onto them.

(h) Drip-pans must be emptied immediately after fluids are collected.

(i) Drain plugs must be replaced, and any openings that could leak fluids must be plugged.

(j) Empty oil filters must be recycled.

(k) Oily solid waste must be discarded into appropriately closed and properly labeled containers and cleaned for reuse, or disposed of as special waste.

(l) Dumpsters, garbage cans, drums, or other suitable containers that are durable, corrosion-resistant, non-absorbent, and non-leaking, must be used for disposing of solid wastes contaminated with fluids or other pollutant materials. Containers must also have a solid cover.

(m) The use of toxic cleaning solvents and other toxic chemicals must be minimized.

(n) Each facility must develop a maintenance plan for all equipment, such as forklifts and hydraulic lifts, to ensure that the equipment does not leak.

3.4 Pollution Prevention Team

(a) Each facility must identify a minimum of one individual who is responsible for developing and implementing a pollution prevention plan as detailed in the Pollution Prevention Guide. Their responsibilities would include:

- establishing responsibilities for inspection, maintenance, and operational BMPs, availability in emergency situations, and record keeping.
- training all pertinent employees in the inspection, maintenance, and operational BMPs, and reporting procedures.
- identifying local MOELP or Environment Canada contacts for information, emergencies, and spill reporting.

- conducting a monthly visual inspection for discoloration of soil in vehicle storage, dismantling, and fluid removal and storage areas. During the rainy season, inspecting visually for floating materials, turbidity, sheen, and odor in the stormwater discharges.
- verifying that the description of the pollutant sources in the Pollution Prevention Plan are accurate.
- verifying that the BMPs are being implemented and are adequate.

3.5 Employee Training

The company must provide the following training:

Certification Training Program

At least one individual of the facility must be certified by attending an environmental training program tailored for the automobile recycling industry. The certified training program is managed by B-CAR and includes the following topics:

- waste management regulations;
- health and safety regulations (WCB/WHMIS);
- the Fire Code;
- spill control planning;
- handling practices of special wastes; and,
- hazards of special wastes handled in the facility.

In-House Training

Employee training must be provided annually by the vehicle recycling facility. The training program will review the following:

- an updated Pollution Prevention Plan (PPP) for the facility;
- spill response procedure;
- good housekeeping, preventative maintenance, and operational BMPs;
- environmentally acceptable material handling practices, particularly those related to vehicle fluids, including fuels; and,
- Material Safety Data for hazardous materials handled in the facility.

Part 4: Vehicle Receiving and Dismantling

4.1 Vehicle Receiving and Inspection

(a) The vehicle receiving and inspection area must be equipped with the appropriate spill control equipment as described in Part 3, above.

(b) The holding area must be examined at least monthly to check for signs of contamination. The inspection date, location, and observations must be recorded by a member of the Pollution Prevention Team.

(c) Upon arrival at the facility, the incoming vehicles must be inspected for leaks from fluid-containing parts, such as engines, radiators, transmissions, fuel tanks, and damaged areas.

(d) Leaking vehicles must be drained as soon as possible. Drip-pans must be placed under leaks to collect fluids for proper recycling or disposal until vehicles can be drained.

(e) Dismantling of fluid-containing components must not be undertaken in the holding area. Parts that do not contain fluid, such as fenders, hood, and seats, may be removed in the holding area.

4.2 Vehicle Draining and Dismantling

(a) The dismantling pad must be designed in such a way as to retain all fluids that may be spilled or released during draining fluids from motor vehicles.

(b) The dismantling pad must be high enough to prevent surface runoff from surrounding areas from flooding onto the pad.

(c) The dismantling pad must be made of chemically-resistant, impervious material.

(d) The dismantling pad must be enclosed in a building or contained under a roof. The roof must be of sufficient size to prevent snow or rainfall from reaching the pad during a rain or snow storm.

(e) The secondary spill containment area must be designed to hold the larger of 110% of the largest volume of liquid special waste in any fluid-containing part, or 25% of the total volume of liquid special waste associated with a vehicle.

(f) Fluid draining must be done on a covered dismantling area.

(g) The engine, transmission, fuel tank, air-conditioning unit, and radiator must be drained before storage, and undeployed airbags must be removed and stored, as outlined in the Best Management Practices (Vol. I).

(h) Drip-pans must be kept under vehicles while unclipping hoses, unscrewing filters and removing parts. Plugs must be replaced when draining is completed. The use of a height-adjustable drip-pan when draining the vehicles is mandatory. The drip-

pan must be kept close to the fluid stream in order to reduce spills, splashes and overflows.

(i) After draining, metal lines must be crimped, and all rubber hoses plugged.

(j) Collected waste fluids must be poured into properly labeled containers immediately after draining.

Part 5: Vehicle Hulk Storage and Crushing

(a) The hulk storage area must be used only to store vehicles that have been processed according to the Best Management Practices, i.e., fluids, batteries, and mercury switches removed prior to storage, with the exception of sealed units such as drop-out rear ends, shock absorbers, and bumper shocks.

(b) Use a crusher with a built-in fluid collection system, otherwise the crusher must be stationed above drip-pans. After crushing, any liquids in the drip-pan must be disposed of properly.

Part 6: Parts Handling

6.1 Parts Storage

(a) The oil-containing parts storage area must be installed on an impervious containment pad inside a building or under a roof. The pad must be impervious to all vehicle fluids, and the roof must be large enough to prevent rain and snow from reaching the secondary containment area.

(b) Store undeployed airbags indoors.

(c) The cores and parts containing fluids, except sealed or drained differentials, must be stored in leak-proof containers, or on a covered and curbed impermeable surface with spill containment and spill controls.

(d) Parts must be stored in a building without floor drainage to the outside. The floor of the containment area must be high enough to prevent flooding by surface runoff from surrounding areas.

6.2 Parts Cleaning

(a) Manual cleaning with a scraper or knife must be done before washing to remove caked-on grease and oil from parts, and to reduce cleaning time and water usage.

(b) Parts shall only be cleaned when necessary.

(c) Cleaning solutions or solvents must be stored in covered and properly labeled storage containers on an impermeable, curbed surface. Asphalt surfaces must be covered with heavy polypropylene plastic with a minimum thickness of 10 mils.

(d) Cleaning solutions or solvents must not be poured or spilled on the ground or down sanitary sewers, storm sewers, or septic drains.

(e) Solvent-based cleaning systems and solvent containers must be placed on an impervious floor with spill containment and spill control equipment.

(f) Pressure washing and steam cleaners shall only be used in conjunction with a zero-discharge recycling system, or a permitted oil-water separator.

(g) Carburetor-cleaning-solution dip tanks shall not be used. Carburetors shall be cleaned using the solvent-based system instead.

Part 7: Fluid Storage Area and Fluid Handling

7.1 Fluid Storage Area

The fluid storage area must be designed according to the Workers' Compensation Board regulations, the fire department regulations, and the Waste Management Act.

(a) The fluid storage containers shall be kept inside a building on a bermed, impermeable surface. If inside storage is not available, roof structure is acceptable providing the roof is large enough to prevent rain and snow from reaching the secondary containment.

(b) Each container must be labeled as to its contents. Toxic characteristics and accumulation start date must also be noted on the containers.

(c) Each waste fluid must be stored in a separate container to allow proper recycling or disposal.

(d) At the perimeter of the tank(s), install a dike or other physical barrier of sufficient height to contain the greater of 25% of the total volume of the enclosed tanks, or 110% of the volume contained in the largest tank.

(e) Fuels must be stored in a separate, secured area, as required by the Fire Code.

(f) All storage containers must be inspected weekly for leakage, and before adding new fluid to prevent overflow.

(g) Waste fluid storage containers must be kept closed with an air-tight lid.

7.2 Fluid Handling

(a) All fluids must be drained and collected on a covered and curbed, impermeable surface.

(b) All waste fluids must be disposed of by a licensed special waste management company.

7.2.1 Used Oils

(a) Used oils must be disposed of as a special waste. The oils may be mixed together and stored in the same container.

(b) Any spill of oil exceeding 100 litres must be reported to the MOELP.

(c) Used oil must be removed from the facility by a licensed used-oil transporter. Used oil must be hauled on a regular basis to avoid accumulating more than the spill containment area can handle. If the facility, within a 30-day period, generates or stores more than 5,000 litres of used oil, it must make a Generator Registration Report and apply for a Consignor Identification Number. A manifest is required to transport more than 205 litres (45 gallons), as required by the Special Waste Regulations (section 46).

7.2.2 Antifreeze

(a) Antifreeze must be separated into reusable and waste antifreeze. Reusable antifreeze can be used in facility vehicles. Waste antifreeze is contaminated or too old to be reused. It is considered a special waste, and must be disposed of as such. To transport more than five litres of waste antifreeze, a manifest is required according to section 46 of the Special Waste Regulations.

7.2.3 Fuel

(a) It should be determined whether fuel is reusable or waste due to contamination with water or other materials, or because it is too old to be reused.

(b) Reusable fuel must be stored in a tank which is designed according to the Fire Code requirements.

(c) Diesel fuel must be stored separate from gasoline.

7.2.4 Refrigerant

(a) All air-conditioning units need to be checked and have the refrigerant removed using approved recovery equipment.

Part 8: Solid Waste Handling

8.1 Oil Filters

(a) Oil filters must be removed from engines and drained before they leave the premises. The removed oil must be recycled.

(b) Drained oil filters must be stored in a closed, leak-proof container, or on a covered, curbed, impermeable surface with spill controls, including drip-pans and absorbents.

(c) Drained oil filters must be recycled. These filters may be transported to a scrap metal recycling facility, or put inside vehicles that are being transported to a scrap facility.

8.2 Lead-Acid Batteries

(a) Batteries should be tested to determine whether they can be reused.

(b) Lead cable ends need to be removed from reusable batteries, and lead parts must be stored in a covered container that is strong enough to hold the excessive weight. Leave battery cable ends on batteries that cannot be resold. Assure that cable ends are recycled.

(c) Cracked or leaking batteries must be placed immediately in a closed, leak-proof storage container. Sealed five-gallon polypropylene plastic pails can be used to temporarily store leaking or cracked batteries.

(d) All batteries must be stored in either a closed, leak-proof container or on a covered, curbed, impermeable, chemically-resistant surface with spill controls, including drip-pans and lime. Storage containers must have a non-reactive surface such as:

- fiberglass or plastic boxes made specifically for battery storage. These can be purchased from local suppliers or supplied by core battery buyers;
- a curbed, impermeable asphalt surface coated with acid-resistant epoxy;
- a covered wooden frame lined with heavy polypropylene plastic, or any heavy sheet plastic;
- a curbed, concrete surface coated with acid-resistant epoxy, fiberglass, or plastic, or lined with heavy polypropylene plastic; or,
- polypropylene cement-mixing tubs.

(e) Batteries must be stored in an upright position, and in stacks no more than five batteries high.

(f) A permit is needed to store more than 10,000 kg of battery waste (approximately 500 batteries). A Consignor Identification Number (BCG No.) is required to

temporarily store (less than 14 days) more than 2,000 kg of batteries (100 batteries).

(g) Battery storage containers and cover materials must be inspected weekly for leaks or cracks, and inspection results must be recorded. Storage containers or materials that have been exposed to freezing temperatures must be checked more often.

(h) Used batteries for recycling must be transported either by a used-battery hauler, or with the facility's own trucks. A manifest obtainable from the MOELP regional office is required to haul more than 1,000 kg of batteries.

8.3 Lead Parts

(a) Lead tire weights and battery cable ends must be removed before crushing vehicles. Battery cable ends may be left on unusable batteries and recycled along with the batteries.

(b) Lead parts must be stored in a covered container that is capable of handling the excessive weight of lead. Lead tire weights may be stored with batteries in battery boxes.

(c) Lead parts must be recycled with a metals or battery recycler.

8.4 Mercury Switches

(a) Mercury switches must be removed from vehicles as soon as possible after they enter the facility.

(b) Mercury switches must be stored in a leak-proof, closed container.

(c) Mercury switches must be reused or recycled with a licensed metal recycler that reclaims mercury.

8.5 Waste Tires

(a) Waste tires present a fire hazard, therefore, only small quantities of waste tires should be stored on-site.

(b) Waste tires must be disposed of by a licensed waste-tire processor.

8.6 Airbags

(a) Leave deployed airbags in vehicles.

(b) Undeployed airbags must be removed from vehicles as soon as possible after they enter the facility.