Golf Course Maintenance Departments

Best Management Practices For

Hazardous Materials/Waste Handling

(Updated July 2016)

Best Management Practices (BMPs) should be thought of as "good housekeeping" practices. In the Golf Course Maintenance industry, you may have some waste streams regulated as hazardous waste by Federal and State laws. Many of these waste streams could be considered nonhazardous if properly recycled instead of disposed of in the trash or down the drain. Listed below are typical waste streams, along with procedures to help you comply with these regulations and help reduce the liabilities associated with noncompliance.

Introduction

The maintenance department is responsible for irrigation, mowing, fertilization, equipment maintenance, pesticide application, and general upkeep of the golf course grounds. The maintenance area is where pesticides are loaded into application equipment, mowers and other pieces of equipment are serviced, and pesticides, fuel, fertilizer, and cleaning solvents are stored. This is where pollution of soil, surface water, or ground water is most likely to occur. Contamination may occur when pesticides are spilled, containers or equipment cleaned and the rinse water dumped on the ground or discharged into the surface water, or improperly cleaned containers are stockpiled or buried. Proper management of the maintenance area is an important part of responsible chemical and pesticide use. Poor handling and disposal practices at these sites can lead to serious environmental problems, expose the ownership to extensive legal liability for contamination and cleanup, including penalties and fines, and create a poor public image for the golf course.

Management practices should be implemented at these maintenance areas in order to prevent the contamination of soil, surface water and ground water by the materials stored and handled at these sites. This document describes a number of "Best Management Practices", or BMPs, which can be put into practice through proper design and operation of the golf course maintenance facilities and equipment.

Principles of Best Management Practices

The general approach to Best Management Practices for golf course maintenance departments involves three principles:

1. Isolate all potential contaminants from soil and water (i.e., pesticides, solvents, lubricants, fuels, paints, etc.)

2. Do not discharge any material other than clean storm water onto the ground or into surface water bodies.

3. Minimize irrigation, fertilizer, and pesticide use requirements through the use of Integrated Pest Management and native or naturalized vegetation wherever practicable.

The first principle involves identifying all the materials stored or handled in a golf course maintenance area, along with current practices that could cause environmental contamination. The next step is to develop management practices that isolate those materials from soil and water during storage, handling,

and disposal. Materials that may contaminate soil and water include pesticides, fuels, solvents, fertilizers, paints, etc. Storing them over impermeable surfaces, cleaning up spills promptly and properly, recycling these materials where possible, and otherwise properly managing wastes will keep these materials from contaminating soil or water.

The second principle is an extension of the first. It includes preventing contamination of stormwater and eliminating the discharge of materials, such as equipment wash water to ground or surface waters. Discharge to surface waters can occur directly, through dumping to a lake or canal, or indirectly, through discharge to a ditch, storm drain, or swale. Discharge to ground water may occur by percolation through highly permeable soils, such as fine sandy soils found in much of Florida, or by flowing into sinkholes, improperly constructed wells or other direct conduits to ground water. **Discharges to surface or ground water should be eliminated through the containment and collection of equipment wash waters and proper management of the collected material.** (See BMPs for Rinse water associated with equipment washing, #13 below)

Described below are several specific BMPs for golf course maintenance areas are which comply with these two general principles. If material handled or a maintenance practice employed at a golf course maintenance area is not addressed below, golf course managers can use these principles to devise their own BMP for that activity or material.

The third principle, that of minimizing fertilizer, pesticide and irrigation use through use of native vegetation and Integrated Pest Management directly impacts the amount of materials handled annually, reduces the annual maintenance budget, and encourages good environmental stewardship. An example of how a golf course owner or operator can obtain assistance in this area is through the Audubon Cooperative Sanctuary Program (ACSP), a program of the Audubon Society of New York State, Inc., sponsored by the United States Golf Association. This voluntary program offers extensive planning, guidance, and technical assistance while requiring no restrictions on the property. All decisions to act on ACSP suggestions are made by the golf course superintendent and course officials.

Types of Waste Associated with Maintenance of Equipment:

1. **Lead Acid Batteries:** Batteries need to be stored on an impervious surface, in an area shielded from the weather. Best Management Practices dictate that batteries be stored indoors, on a wooden pallet over acid-resistant material. If any cores are missing caps or are cracked, place them in an acid-resistant plastic container, along with neutralizing material for leak absorption. Prevent acid from reaching soil and surface waters. This will reduce cost for contamination clean up and limit potential penalties. If you currently use your battery supplier to dispose of spent batteries, be sure that the supplier documents the number of cores removed on your **receipt**. If you are not using your battery supplier to recycle batteries, you may take your used cores to a scrap metal dealer. Again, secure a **receipt** noting the number of cores that were disposed. **Keep receipts ON SITE for a minimum of three years.** When your batteries are recycled, they are not counted towards your facility's hazardous waste totals.

2. **Used Oil:** To ease the burden of managing too many storage containers, used oil should be stored in one above ground storage tank (AST), if possible. If it is necessary for you to use 55-gallon drums as storage containers, they must be in good condition. 40 CFR 279.22(b) states: containers and aboveground storage tanks used to store used oil at generator facilities must be in good condition (no severe rusting, apparent structural defects or deterioration) and not leaking (no visible leaks). Drums must also be Department of Transportation (DOT) approved. Used oil containers that are not double walled must be placed within a secondary containment system. The secondary containment system must have the capacity to hold 110% of the volume of the largest container within the containment system. Your used oil containment area should have a sealed oil-resistant coating and be under

cover. This will prevent rain from entering the storage area, mixing with oil and, subsequently, becoming contaminated. Make sure that all containers are capped when you are not transferring used oil from temporary containers. This provides additional assurance that water will not enter the container and contaminate the oil. The storage container and any fill pipes to the storage container must be labeled "Used Oil". The "Used Oil" signage must be visible from all approaches on the container (i.e. on each side). If you are using drums, each individual drum must be labeled. Receipts from the used oil hauler must be kept on site for a minimum of three years. When selecting a used oil hauler, be sure to check with the Florida Department of Environmental Protection about the company's record of compliance.

3. **Used Oil Filters:** Limited options are available for disposing of this type of waste. **You can no longer dispose of used oil filters into the solid waste stream.** All filters should be completely drained of any free flowing oil (preferably crushed) and placed into a marked container with a secure lid. You can dispose of these filters in two basic ways: (1) After containerizing the filters they can be hauled to the Waste-to-Energy (WTE) facility; or (2) You can contract with a hauler to have them haul the filters to the WTE. The recommended BMP for draining and crushing filters is to "hot drain" the filter for 24 hours. Hot draining filters will minimize the volume of used oil inside the filter, and crushing them will reduce the amount of space used in the container. This can save you quite a bit of money if you are having a private hauler take them. (Check with your filter hauler before crushing). Do not crush filters by driving a vehicle over them! Label all drums "Used Oil Filters" and keep all receipts from the hauler a minimum of three years to show proof of proper disposal. Store in a closed-lid drum, inside a containment area that is protected from the weather.

4. **Parts Cleaning Machines:** There is a multitude of choices when it comes to parts washers. The most-regulated systems are those that use chlorinated solvents or chemicals with low flash points. It is advisable to investigate other non-hazardous systems. The less-regulated systems may allow you to manage your parts washing operations without relying on another company to haul the waste away monthly. This may reduce the amount of waste that you haul monthly, thereby reducing your generator status and lowering your level of regulatory requirements (saving time and money).

   If you use mineral spirits to wash parts **AND your business is defined as a CESQG** (generates less than 220 pounds hazardous waste monthly), the Florida Department of Environmental Protection (FDEP) states that you may place mineral spirits in with your used oil. **Written permission from the used oil hauler must be kept on file at your facility.** An FDEP memo dated June 23, 1992, states that mineral spirits can be mixed with used oil under the following conditions: (1) The mixture does not contain more than 1,000ppm halogens and does not exhibit the ignitability characteristic (flash point less than 140° F); (2) The mixture is not determined to be hazardous waste through laboratory testing for toxicity characteristic (heavy metals). If the above conditions are met, the mixture may be hauled as used oil destined for recycling. It is never suggested to use chlorinated solvents. Chlorinated solvents can cross-contaminate your waste stream and cause recyclable waste to become hazardous waste.

5. **Aerosol Cleaners:** Many different kinds of aerosol cleaners promise they are "environmentally friendly". Read the label and consult the Safety Data Sheet (SDS, formerly Material Safety Data Sheet/MSDS) for the listing of active ingredients. If any of the ingredients contain the word "chlor", the aerosol contains chlorinated solvents. **Chlorinated solvents are one of the main ingredients in aerosol cleaners that make them regulated. Avoid using chlorinated cleaners. They can cross-contaminate other waste streams.** Products contain other regulated ingredients, so read labels and Safety Data Sheets carefully.

A container is considered empty if the pressure inside the can is the same as the atmospheric pressure outside the can, with all material dispersed. Once an aerosol can is "empty" it can be disposed of in your normal trash. If the container cannot be emptied, it must be treated as hazardous waste if any regulated material remains inside. You may want to look at purchasing cleaners in bulk that use reusable containers. These reusable containers can be pressurized with your own air compressor. This will save cost in purchase of materials and reduce the number of disposed containers.

6. **Waste/Used Antifreeze:** Recycling on site reduces your monthly hazardous waste totals and can minimize the regulations that you are required to comply with by reducing your generator status. **Recycling on site is done three different ways depending on the quality of the antifreeze and the amount generated**. (1) Antifreeze should be put back into the vehicle that it was taken out of whenever possible. (2) Recycling this waste on site with a machine owned by the facility is another option. If you own your own antifreeze-recycling machine you will have filters that will occasionally need to be changed. These filters build up heavy metals over time and should have a waste determination preformed on them before disposal, or simply haul them as a hazardous waste and manifest as such. A logbook should be kept with the amount of antifreeze recycled and the date, which should be kept for a minimum of three years. (3) There are several contractors that will come to your site to recycle your antifreeze. This service works well for all types of facilities, from Large Quantity Generators to Conditionally Exempt Small Quantity Generators. Even if you decide that you don't want the recycled product, you can have the recycling contractor haul it for cheaper than it would cost to have it hauled by a hazardous waste hauler. There is also less paperwork involved with this option. Waste antifreeze must be stored in separate waste containers and properly labeled. These containers should be marked "used antifreeze" for recycled antifreeze or "hazardous waste" for antifreeze that is hauled as hazardous waste. Before disposal as waste antifreeze, a waste determination must be performed. This will require testing utilizing TCLP for heavy metals. Depending on the test result, it may be hazardous waste and will require you to have the appropriate hauler remove this waste with proper documentation (manifesting). Keep the receipt showing proper disposal for a minimum of three years. Recycling antifreeze on site is the preferred management practice. Make sure that anti-freeze is not stored in a container that cannot be completely emptied because any sludge will sink to the bottom of the container. Once in the container, the sludge may not be able to be removed if it is a large tank. A container with a wide opening is preferred (55gal. drum with an open top that clamps on and meets DOT standards). Receipts from the recycler or the hazardous waste hauler should be kept for a three-year minimum. For facilities that recycle their own antifreeze documentation needs to be kept in the form of a logbook with date, and amounts recycled.

7. **Shop Rags:** Do not use disposable shop rags in certain processes at your facility. If you do use disposable rags and they are contaminated, they must be hauled as hazardous waste. To avoid this problem, contracting with a uniform service may be a better option for limiting your liability. Contracting with a company that will supply you with clean rags on a regular basis may be expensive, but it could save you money in fines for improper disposal of hazardous waste. These contractors are permitted by state and local agencies to wash the rags, which are, considered a recyclable item. Used rags should be placed into a closed-lid container, which is properly labeled for the rag service. They will then pick up and launder the rags. Make sure that you receive receipts, which will serve as your documentation. Keep all receipts for a minimum of three years. Use shop rags instead of absorbent for small drips and dribbles. Do not mix rags together with different wastes into the same storage container, as they may be reactive to one another and become a fire hazard.
   ***A new rule has been put in place by FDEP for the Management Practices for Wipes, Rags, and Shop Towels that are only contaminated with Excluded Solvents.** This rule provides another disposal option for wipes, rags, and towels that meet the conditions for exclusion. For more information on this rule, and a list of the solvents, please refer to the handout provided.

8. **Absorbent Material:** Absorbent materials are needed when spills occur. The types and amounts of spilled material will determine how you need to dispose of the absorbent material used. As a general rule: use absorbent materials for oil spills only, or for emergency situations where nothing else is available. Heat-treated peat moss is the preferred absorbent if this material is going to the county incinerator WTE. Do not use absorbents for spills involving gasoline, diesel, antifreeze, battery acid, etc. Use rags provided by your rag service for small spills, drips and/or dribbles. Absorbents will not change the fact that a spilled hazardous substance is a hazardous waste, and must be disposed of accordingly. Heat-treated peat moss and other absorbents should be used for large spills and/or emergency spills. The substance being absorbed will dictate disposal requirements. If you have further questions about this waste, please call to verify proper disposal.

9. **Air Conditioning Repair:** The procedure for this type of operation depends on the type of machine you have. A system that captures, recycles, and places the Freon back into the system being serviced is preferable to a system that merely catches Freon and places it into a container for shipment off site. Do not discharge Freon to the atmosphere. Make sure your equipment is registered with the Florida Department of Environmental Protection (FDEP) and the employee has the proper training to perform the work (ASE Certified). All associated paperwork for this operation must be kept on site. Any records pertaining to reclamation and disposal need to be kept for a three-year minimum.

10. **Waste Fuel Filters:** These types of filters can include in-line gasoline and/or diesel filters, fuel/water separator filters, and fuel dispenser filters. Limited options are available to you for disposing of this type of waste. The filters can be drained of all free flowing fuel and placed in a container that is properly marked and has a tight fitting lid to keep fumes from escaping. If your facility generates small numbers of these filters, you can dispose of them in the same container as your used oil filters. If you generate large numbers of fuel filters, store them separately in a drum with a tight-fitting lid to minimize the threat of explosion. Drain all residues from filters. Residues from fuel filters can be disposed of in your used oil, as long as the used oil is being recycled, and does not change the ignitability characteristic of the mixture (Fed. Reg., Vol. 50, No.280, Nov., 29, 1985, p.49179).

    Draining the filter to minimize the amount of used fuel in the filter element is recommended. Fuel filters may be stored in the same container as oil filters and can be managed in two basic ways; they can be hauled to the WTE by you or by a licensed hauler. **No filters can be disposed of in a landfill.** The filters should be drained. Not only does this minimize the volume of used fuel inside the filter, but it also reduces the amount of free liquid in the collection drum for the filters. Label the drums Used Fuel Filters and keep the receipts from the hauler a minimum of three years to show proper disposal. Store the drum, with lid closed, inside a containment area that is protected from the weather.

11. **Discarded Gasoline & Diesel Fuel:** Fuels removed from vessels that cannot be used must be disposed of as hazardous waste. This includes both proper labeling and documentation of the management activities. Waste gasoline should be stored separately from other wastes. Please consult the haulers list provided to you for a list of companies that can legally haul this waste.

12. **Fluorescent Bulbs:** Fluorescent bulbs/devices are considered hazardous waste because they contain the heavy metal **mercury**. However, if you recycle under the Universal Waste Regulations, fluorescent bulbs/devices do not qualify as hazardous waste. Please call the Pollution Prevention (P^2) Program for a list of fluorescent bulb recyclers and handling instructions. Caution: if a supplier tells you that their bulbs are environmentally safe, remember that they are trying to sell you a product, and that they may not be familiar with the State and Local regulations that pertain to the proper recycling or disposal of these mercury-containing bulbs. **Lamps or devices with any mercury must be recycled following the Universal Waste Regulations or disposed of following**

hazardous waste regulations. Please refer to the Management of Spent Mercury-Containing Lamps and Devices handout for further details.

13. **Rinse Waters from Equipment Washing:** Rinse water from equipment washing should not be discharged to surface or ground water, but instead should be contained within tanks where the water is reused and sent back to the tanks. This type of system is known as "Closed Loop," because it never discharges any wastewater. These systems often have several layers of filters to keep out dirt and grass clippings. These filters must be cleaned regularly, and disposal of their contents varies upon the system. Any dirt that is filtered out should be tested for pesticide contamination. Grass clippings can be stored in a compost pile that is made from impermeable materials (concrete, metal etc.). Any water that might build up within the storage area can be piped into the storage tank for equipment rinse water.

Best Management Practices for Pesticides

All Persons that apply pesticides should license to do so according to the state and federal regulations regarding that specific pesticide. Safety precautions associated with loading and application of pesticides should be strictly adhered to; information on this subject can be found in 29 Code of Federal Regulations. Specifications on respiratory and other personal protection equipment can found in the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards. To order, call (703) 487-4650. This book can save your life!

Storage and loading areas: Storage areas are required to be ventilated, and should be aired out before you enter them. The building should be constructed from metal or concrete, and should be separate from any other structure by fifty feet. This will allow fire equipment to gain access if necessary. Monitor your pesticide inventory closely to avoid overstocking fertilizers, pesticides, fungicides, herbicides etc. Any pesticides that are out of date, off-specification, or simply cannot be used for their intended purpose must be disposed of as a hazardous waste. Keep all Safety Data Sheets on all materials currently being used as well as materials previously discontinued, up to twenty-five years. **Do not store any petroleum products, chlorine, or pesticides together; combining these materials can cause violent reactions or explosions.** Before transporting any of these wastes, be sure to check with the Lee County Pollution Prevention Program or Local FDEP office for guidance. Many of these wastes are "Acute Hazardous Wastes" that cannot be transported by the generator, and are extremely dangerous. Make sure that metal shelving is used in the storage area, as opposed to wooden shelving that will soak up pesticides and later need to be handled as a hazardous waste. Flooring in the storage area should be concrete (sealed with chemical resistant paint) or other seamless, impervious surface.

Loading areas should be enclosed so that any spillage is contained and can be easily put back into the spray truck or other application device. All containers must be triple rinsed, with the rinse water being put back into the application process, and the containers must be slashed before disposal in the solid waste stream. Follow all recommendations for personal protective equipment dictated by the materials that are being used. Again, consult the NIOSH POCKET HANDBOCK for specific respirator requirements.

Miscellaneous Building Maintenance: Waste streams associated with building maintenance include: paint related waste, mercury containing lamps, ballasts (possible PCB's), thermostats, batteries from emergency lighting, electronic equipment (i.e. computers, monitors, handheld radios etc., Stripping of floors and rug cleaning, smoke detectors, etc.

*__Safety Data Sheets__ are a good start to determine if your waste stream will be hazardous waste. They do have their limitations if they are too vague. SDS's do not take into account what process or system the product may be used in or what your management practices are for preventing cross contamination. They are a free tool for you to use that can be received from your supplier of the product. Before purchasing any product, request the SDS to see what is in it and to help avoid costs associated with the purchase, use, and disposal of the product.

Do Not's

- Do not use any chlorinated solvents.
- Do not use one container as the "catch-all" for all fluid draining procedures. This can cause cross-contamination of waste.
- Do not store any materials/waste near storm drains, ditches, creeks, rivers, canals, or any bodies of water that would be contaminated if a spill occurs.
- Do not throw away, or send to a bookkeeper, receipts that show your disposal of waste materials. They are required to remain on site for a minimum of three years. This includes contracts with hazardous waste haulers.
- Do not take the word of any sales person who will not supply an SDS for the product he/she is selling. Some will say that the material is biodegradable or environmentally friendly, but the process that you use the material in may contaminate the product and cause it all to be regulated (i.e. equipment degreasing and rinsing).
- Do not mix any waste with another waste. This will increase your cost for disposal. The most common mistake is to mix the wrong materials into the used oil. Check with your used oil hauler for what is acceptable to mix together into the bulk used oil container. Get this in writing from your hauler!
- Do not dispose of any material into your septic system, sanitary sewer, or storm sewer. If you want to do this you must have written permission from the Regulatory agency that permits that particular system. Septic System-Department of Health and Rehabilitative Services; Sanitary Sewers- utility district in which your facility is located; Storm Sewer-Department of Environmental Protection.
- Do not store hazardous waste out of containment areas. Make sure all containers are properly labeled (include dates where necessary).
- Do not hesitate to ask any questions when it comes to managing your hazardous waste streams.

If you have any questions, please call the Division of Natural Resources Management, Pollution Prevention (P^2) Program at (239) 652-6126.