

Elements of an Operational BMP Program for Georgia Marinas



GEORGIA CLEAN MARINA PROGRAM
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Building a Best Management Practices (BMP) Program

Step 1: Audit your marina for generated wastes.

A waste audit is the process of determining waste sources and the quantity of each waste generated and disposed of during marina operations. Analyses of waste sources will generate options for controlling and disposing of waste materials in an environmentally responsible and cost-effective manner for your business.

Every area of the marina operation creates sources of waste, which may be disposed of in various manners. Evaluate the volume of waste generated that collectively is disposed via dumpster, used oil pick up, recycling centers, etc. This may be as simple as walking around the marina and visually estimating the types, sources and amounts of wastes generated. It can also be a comprehensive analysis of procurements, materials use and disposal methods. A more detailed audit will better define the waste collection and storage system requirements. This information can be used to identify both waste reduction and environmental damage reduction options and to assess the operational and economic feasibility of the best options. Management should include staff in the audit and BMP program development.

Step 2: Evaluate your pollution prevention options.

Options for waste reduction are to reduce, reuse or recycle. The finished waste audit should provide guidance on these options. Reducing waste should address purchasing (e.g., reusable containers, reducing packaging, or buying in bulk). Recommend customers using their own containers, avoid “disposable” products, and use recycled products. Consider reusing packaging or returning it to suppliers. Recycling has a popular image, but the supply of materials exceeds demand and recycling facilities often are not easily accessible.

This section of this manual described BMP options for pollution prevention. Once your options are identified, evaluate the technical and economic feasibility of each option. These evaluations can help determine which pollution options are most suitable for implementation at your facility. Pollution prevention options range from simple and easy-to-implement techniques to detailed engineering or design changes. The options you choose will depend on your facility’s operations, needs, and environmental goals.

Step 3: Put your BMP Program in writing- make it a part of your operating manual

The heart of the successful BMP program is a training plan for employees, customers, and outside contractors. This plan must require that your BMP program be presented in written form to those who will actually perform most BMPs.

Step 4: Implement your BMP Program

Ultimately, carrying out your BMP program is the responsibility of marina employees, customers and outside contractors. To maximize the effectiveness of waste management plans, everyone must be led to participate. A successful program will incorporate an educational and promotional strategy communicating purpose and guidelines. This strategy should include, for example, employee training, primary topics of newsletters and posters, signs and contractual agreements.

The following provides BMP options that suggest ways to minimize pollution during daily marina operations. There are 12 areas of focus.



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Area of Focus 1: Stormwater Management

A stormwater permit and a formal Stormwater Pollution Prevention Plan are required for marinas by the Georgia Environmental Protection Division (EPD). The deadline for filing a “Notice of Intent” to discharge stormwater runoff and obtaining a stormwater permit has passed for existing facilities. *If a marina has not yet obtained a permit, EPD should be contacted to begin the permitting process now.* The stormwater permit requires development and implementation of a Stormwater Pollution Prevention Plan (SWPP). The basis of the plan is to use BMPs to prevent stormwater from becoming contaminated.

Marina Site Design BMPs

The principal pollutants in runoff from marina parking and operations areas are suspended solids and organics, predominately oil and grease. In addition, toxic metals from boat hull scraping and sanding are part of, or tend to be associated with, the suspended solids.

BMPs:

- Install pollutant filters and buffers between shoreline/wetlands & upland facilities

An impervious surface such as concrete or asphalt will act to hasten the flow of contaminated runoff to the closest surface water. A pervious surface is an effective buffer between the shoreline or wetlands and the upland facility. Pervious surfaces are best installed during initial construction, but may be retrofitted, including:

Sand Filters

Sand filters (also known as filtration basins) consist of layers of sand of varying grain size (grading from coarse sand to fine sands or peat) with an underlying gravel bed for infiltration, or perforated underdrains for discharge of treated water. Pollutant removal is primarily achieved by “straining” pollutants through the filtering media band by settling on top of the sand-bed and/or a pretreatment pool. Sand filters may be used on sites with impermeable soils since the runoff filters through filter media, not native soils. The main factors that influence removal rates are the storage volume, filter media, and detention time. Sand filters will become clogged with particulates over time. In general, clogging will occur near the runoff input to the sand filter. Frequent manual maintenance is required of sand filters, primarily raking, surface sediment removal, and removal of trash, debris, and leaf litter.

Wet Ponds

Wet ponds are basins designed to maintain a permanent pool of water and allow temporary collection and settling of storm water. Pollutants are removed by the settling of particulates, chemical coagulation and precipitation, and biological uptake.

Constructed Wetlands

Constructing wetlands is normally an impractical BMP because of cost, except where the extreme sensitivity of receiving waters warrant exceptional levels of stormwater treatment.

Infiltration Basins/Trenches to Increase Ground Water Recharge

Porous basins and trenches reduce runoff by increasing ground water recharge. Prior to infiltration, runoff is temporarily stored at the surface, in the case of infiltration basins, or in subsurface stone-filled trenches. Infiltration devices should drain within 72 hours of a storm event and should be dry at other times. Infiltration basins have a high failure rate as a BMP. The type of soil, water table level and other factors affecting drainage must be carefully considered.

Porous Pavement

Porous pavement has a layer of porous top material covering an additional layer of gravel. A crushed stone-filled groundwater recharge bed is typically installed beneath these top layers. The runoff infiltrates through the porous asphalt layers and into the underground recharge bed, then exfiltrates

into the underlying soil or into a perforated pipe system. High sediment loads and oil can result in clogging and eventual failure of the system, therefore, porous pavement is not appropriate for treatment of runoff from the hull cleaning/maintenance areas. Porous pavement is recommended for low-intensity automobile parking with quarterly vacuum sweeping or jet-hosing to maintain porosity.

Vegetated Filter Strip

Grassed areas between marina parking and maintenance areas provide a natural filter for polluted surface water runoff. The effectiveness depends on width, slope, soil type, vegetation type and permeability. As runoff moves through the vegetation, sediments and attached pollutants are filtered out. Dissolved pollutants, such as nitrate, are removed by uptake in plants and through chemical and biological interactions with the soils. These grassed areas may be used as marina amenities, as long as the grass is not worn down by traffic.

Grassed Swales

Grassed swales are low gradient conveyance channels that may be used in place of buried storm drains. To effectively remove pollutants, the swales should have relatively low slope and adequate length and should be planted with erosion-resistant vegetation. Properly designed and functioning swales provide pollutant removal through filtering by vegetation of particulate pollutants, biological uptake of nutrients, and infiltration of runoff. The use of check dams is recommended in the swales to slow the water velocity and provide a greater opportunity for settling and infiltration. Grassed swales require mowing and periodic sediment removal.

Maintenance Area: Site Design and Installation Options

The proper design and operation of the marina maintenance and repair areas is a significant way to prevent the entry of toxic pollutants from marina property into surface waters. Recommended design features include the designation of impervious areas (e.g. cement areas) for hull and engine maintenance and repair areas; the use of roofed areas that prevent rain from contacting pollutants; and the creation of diversions and drainage of off-site runoff away from the maintenance and repair area for separate treatment. Source controls that collect pollutants and thus keep them out of runoff include the use of sanders with vacuum attachments, the use of large vacuums for collecting debris from the ground and the use of tarpaulins under boats that are being sanded or painted.

Specific BMPs for Maintenance Area Site Design:

- **Design boat maintenance areas to contain pollutants:** Boat hull maintenance areas should be designed so that all maintenance activities, which are significant potential sources of pollutants, can be accomplished over dry land and under roofs (where practical). This will allow for collection of spills and proper disposal of by-products, debris, residues, solvents, spills and stormwater runoff.
- **Designate and Control Maintenance and Repair Areas:** Boat maintenance and repair include hull, topside and equipment washing, sanding, painting, fiberglassing and a wide variety of mechanical work. These activities produce liquid and solid wastes that must be contained, stored and disposed of. Designating specific areas for work provides maximum control of wastes, including cleanup in the event of spills. Once maintenance and repair areas are designated, no work should be allowed outside of the areas.
- **Establish strict BMP guidelines for repair and maintenance areas:** Adequately convey BMPs to those using the areas. This may include customers and outside contractors, as well as marina employees. Marina employees should be well versed in the guidelines and empowered to ensure customers and contractors abide by the BMPs involved. Before beginning work outside contractors and customers should sign a contract which includes BMP requirements for the designated areas.

- **Indoor Boat Maintenance & Repair is Preferred:** Maintenance and repair should be confined to indoor space whenever possible. This will help contain contaminants and prevent rain and wind transport into surface waters and wetlands. Occupational Safety and health (OSHA) precautions and Clean Air Act provisions must be followed when working indoors in confined space.
- **Stencil Warnings on Storm Drains:** “Dump no waste- drains to the river”
- **Use Catchments, Separators, Sorbents in Wash & Maintenance Areas:** Pollutants such as oils and other engine fluids, soaps and other cleaners are generated in the boat wash and maintenance areas. Pollutants borne by surface water runoff and wind can be captured and cleaned.

Maintenance Area Installation Options as BMPs:

Oil-Grit Separators

Oil-grit separators may be used to treat water from small areas where other measures are not feasible and are not applicable where activities contribute large loads of grease, oils, mud, sand, and trash to runoff. Actual pollutant removal only occurs when the collection chambers are cleaned out. These separators have two chambers, the first of which traps sediments and the second separates oil. Inspections and maintenance is required semiannually and after major storms.

Holding Tanks

Holding tanks act as underground detention basins that capture and hold stormwater until it can be treated. There are two types of tanks: first flush and settling tanks. First flush tanks are used when the time of concentration of the impervious area is 15 minutes or less. The contents of the tank are transported via pumpout or gravity to another location for treatment. Excess runoff is discharged via the upstream overflow outlet when the tank is filled. Settling tanks are used when a pronounced first flush is not expected and require periodic cleaning.

Swirl Concentrator

A swirl concentrator is a small, compact, solids separation device with no moving parts. During wet weather the unit's overflow is restricted, causing the unit to fill and to self-induce a swirling vortex. Secondary flow currents rapidly separate settleable grit and floatable matter. The pollutant matter is concentrated for treatment while the cleaner flow discharges to receiving water. Swirl concentrators are intended for use under high-flow regimes and may be used in conjunction with settling tanks.

Catch Basins

Catch basins with flow restrictors may be used to prevent large pulses of storm water from entering surface waters at one time. They provide some settling capacity because the bottom of the structure is typically lowered 2 to 4 feet below the outlet pipe. Removal efficiencies for larger particles and debris are high and make catch basins attractive as pretreatment systems for other practices. The traps of catch basins require monthly inspections and periodic cleaning.

Absorbents in Drain Inlets

While there is a tendency for oil and grease to sorb to trapped particles, oil and grease will not ordinarily be captured by catch basins, swirl concentrators or holding tanks. Absorbent materials placed in these structures in a manner that will allow sufficient contact between the absorbent and storm water will remove much of the oil and grease load of runoff. In addition, the performance of oil-grit separators can be enhanced by the use of absorbents. An absorbent/catch basin system could be designed that treats the majority of grease and oil in stormwater runoff. Annual replacement of the absorbent would be sufficient to maintain the system in most cases. Manufacturers report that their products are able to sorb 10 to 25 times their weight in oil.

Catch Basins with Sand Filters

Catch basins with sand filters consist of a sedimentation chamber and a chamber filled with sand. The sedimentation chamber removes coarse particles, helps to prevent clogging of the filter medium, and provides sheet flow into the filtration chamber. The sand chamber filters smaller sized pollutants. Catch basins with sand filters are effective in highly impervious areas where other practices have limited usefulness. The effectiveness of the sediment chamber for removal of the different particles depend on the particles' settling velocity and the chamber's length and depth. The effectiveness of the filtration medium depends on the depth of the filter medium.

Catch basins with sand filters should be inspected at least annually, and periodically the top layer of sand with deposition of sediment should be removed and replaced. In addition, the accumulated sediment in the sediment chamber should be removed periodically. With proper maintenance, and replacement of sand, a catch basin with sand filter should have at least a 50-year life span.

Tarpaulins and Windscreens

Tarps and windscreens can facilitate collection of paint chips and spend abrasive from paint-removal operations. If site characteristics (i.e., minimal slope, high water table, and/or impervious soils) do not allow for use of other practices, screen tarps may be placed on the ground prior to placement of a boat in a cradle or stand and subsequent painting/sanding. Solid or waterproof tarps will do a good job of catching dust and debris, but a heavy rain may wash them clean before the debris is collected. A screen or porous tarp will allow water to seep through while retaining the debris. Geotextile, the material used in civil engineering construction projects is an example of a material for a screen tarp. These tarps may be disposed of in a dumpster going to a state-approved landfill. Similarly, a pervious cloth windscreen should be installed down wind to collect wind borne debris from the hull maintenance operations.

Special Tools

Vacuum sanders and scrapers equipped with vacuums, for example, are a means to contain and prevent pollutants from entering surface water by runoff or wind. Considering having vacuum sanders available for customer rental.

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Area of Focus 2: Fueling Operations

Fueling operations have the potential for the release of gas, diesel and oil into the water and ground. Release occurs through spillage and through the fuel tank air vents that flow overboard. Prevention is in the form of proper fuel station design, well-maintained equipment, leak detection, implementing proper procedures, and user training.

Fueling BMPs as Preventative Measures

- **Develop and implement an inspection and preventative maintenance program.** Inspect and maintain fueling equipment at predetermined intervals and fix damages and leaks promptly.
 - a) **Dispensing equipment.** Hose nozzle, hose, hose reel, filters, valves and dispenser connections must be kept leak free. Maintain properly positioned catch pans with absorbent pads for the occurrence of small leaks and nozzle drip. Remove holding clips from automatic backpressure sensitive shut-off nozzles. Do not allow chocks in the area for holding nozzles open- nozzles must be kept open by hand during fueling. Keep hose reels tracking and locking properly to avoid hose damage.
 - b) **Fuel storage tanks and lines.** Inspect the integrity of impervious curbs, berms and other secondary containment for above ground tanks (containment should be capable of handling 110% of the largest tank in the enclosure). Valves and connections must be kept leak free.

Underground storage tanks (UST) must comply with Federal Regulations, including leak detection, spill and overfill detection and corrosion protection. Your UST installation, maintenance program and record keeping should meet the basic EPA requirements and any other standards set by the Georgia EPD for your facility.

For information on USTs, refer to “EPA Musts for USTs- A Summary of Federal Regulations for Underground Storage tank Systems.” For information specific to your marina UST installation, contact GA DNR EPD’s Environmental Specialist.

- **Use fueling shut off device.**
 - a) **Valves.** Non-emergency and emergency shut off valves should be maintained in the line at strategic locations to allow quick and easy shut down for system maintenance, filter changes and to stem the flow of leaks before and during repairs. Pressure drop sensitive electric solenoid valves should be positioned landward of the fuel dock and periodically tested.
 - b) **Emergency electrical fuel shut off.** Switches should be located in clear view of and accessible to the fuel dock operator, with signage for customer alert.
 - c) **Boat fuel tank vent fill indicators.** Encourage the use of fuel/air separators in boat fuel vent lines to signal that the tank is nearing full. These separators prevent the almost inevitable small spills that occur when filling fuel tanks. In the absence of a separator, hold an absorbent pad at the vent opening or use a container that lies flush on the hull under the vent.

BMPs for Monitoring Fuel Leakage from Storage Tanks or Lines

- **Track and reconcile fuel inventories.** Accurate tracking of daily fuel sales and reconciliation with inventories is an important means to verify that fuel is not being lost through leakage. The procedure involves setting up a form on paper or a computer to record beginning and ending gallon and dollar readings for each dispenser. These totals should be compared to sales ticket totals for the day and confirmed against periodic “stick” or electronic inventory measurements of tank levels. A reason should be determined for any inventory shortage.
- **Look for the following signs of leakage.**
 - a. Oily sheen on surface waters.
 - b. Fuel soaked soil
 - c. Fuel odor in soil or water
 - d. Tank water increase- if water is leaking in, fuel may be leaking out.

Develop a Standard BMP Procedure for Fuel Spill Response

Spills must be controlled immediately. U.S. Coast Guard regulations require that all spills that cause a visible sheen on the water be reported. Using absorbents, such as the commercially available products, straw or sawdust can contain land spills. Spills in the water require the commercial products. If a spill is experienced, it is wise not to try to handle it alone. Contact the Coast Guard and GA DNR for assistance. State and Federal regulations require the prompt reporting of spills. BMPs for responding to fuel spills include the development of a standard fuel spill plan.

Implement Fueling BMP Information and Training

- **Who to inform and train?** Employees, boat owners and fuel delivery personnel all have the opportunity to spill fuel and to contain fuel spills. Employee training is the most critical, as they may have the greatest chance to influence your customers and delivery personnel. Employee training is usually an ongoing process because of personnel turnover, so written training materials with formal practice drills are most effective. Customer training occurs through contracts, newsletters and pamphlets, but most effectively by employee guidance and signage at the fuel dock.

A Summary of Georgia Rules for Disposing of Collected Wastes

Nonhazardous Solid Wastes

Solid waste generated by your facility from maintenance operations must be disposed of in a manner consistent with the State of Georgia Rules for Solid Waste Management Chapter 391-3-4. The definition of solid waste referenced in the Rules is specific, but it is generally a material that does not have further use in a manner that it was intended, and cannot be recycled or reused. Solid waste must be disposed of at an EPD approved solid waste disposal site, (e.g., landfill site). Dumpsters can be leased and located at your site by a local solid waste management operator. Just because something can be recycled, does not mean it is being recycled. Sixty percent of waste materials must be removed, sold, or recycled every 90 days to avoid waste accumulation [391-3-4-07 (7) (C)].

Nonhazardous Liquid Wastes

Generally, any nonhazardous liquid waste may be disposed of at a landfill, provided that the waste is in a form that does not allow free liquid to escape. Provided the material is nonhazardous, it may be mixed with sawdust, kitty litter, or a commercial absorbent (e.g., Oil-Dry) to absorb the liquid, containerized and disposed of at an EPD approved landfill. A landfill cannot accept liquid wastes as per the State solid waste management rules, so any nonhazardous liquid wastes must be put in the above-described form.

Hazardous Wastes

Hazardous waste disposal is a more involved disposal process. You may be surprised at the amount of hazardous wastes you are disposing of in violation of the Georgia Hazardous Waste management Act- more than likely unintentionally on your part.

Area of Focus 3: Nonhazardous Waste Handling

Marinas should properly dispose of solid wastes produced by the operation, cleaning, maintenance, and repair of boats to limit entry of solid wastes into surface waters. Marina operators are responsible for determining what types of wastes will be generated at the marinas and ensuring proper disposal. Marina operators are responsible for the contents of their dumpsters and the management of solid waste on their property.

The MARPOL Treaty

The MARPOL Treaty (**MAR**ine **POLL**ution Treaty- a convention of the International Maritime Organization, a specialized agency of the United Nations) influences solid waste management at marinas. The management of solid waste at marinas is regulated by the “Rules of Georgia DNR EPD under Chapter 391-3-4, Solid Waste Management”.

The MARPOL Treaty prohibits dumping of any of the following within 3 nautical miles of the U.S. coastline:

- Garbage (food wastes)
- Plastics
- Trash (non-plastic)
- Packaging
- Line
- Nets
- Fish cleaning wastes

MARPOL requires reception facilities for garbage at ports, which includes recreational boating marinas. Management of solid waste to satisfy MARPOL conditions means balancing the requirements of boaters and the facility itself. *See Section 4.16 Regulations for the Prevention of Pollution by Garbage from Ships (MARPOL).*

BMPs associated with MARPOL regulations:

- Have adequate waste containers for boaters’ trash disposal.
- Provide easy access to the waste containers and ease of use.
- Ensure that containers have lids in place.
- Ensure containers for recyclables are clearly labeled.
- Ensure that containers are emptied into the dumpster or sent to the recycling center regularly.
- Don’t allow containers to overflow.
- Keep dumpster drains closed.
- Do not allow customers to put waste directly into the dumpster. Marina operators should know and control what goes into the dumpster.
- Call for waste pick-up before the dumpster is completely full.
- Consider variations in seasonal demand.
- Instruct boaters, outside contractors and employees about disposal methods.
- Provide clearly marked recycling receptacles.
- Install solid waste disposal information signs.

A variety of methods are used to meet these requirements. While some marinas meet all the criteria by having one dumpster in a central location, others use many small receptacles in special protective coverings and more than one dumpster. Inefficient methods include: (1) too many receptacles, which requires intensive labor for emptying; (2) receptacles too close to the water, which requires additional labor to remove trash from the water; and (3) inconvenient location of receptacles.

Be user friendly. The presence of lights around trash receptacles and signs with directions to receptacles makes waste disposal easier for boaters. Informational signage helps to prevent inappropriate trash disposal (e.g., used oil in the dumpster or bags of trash left on the dock) and facilitates recycling.

The Georgia Rules for Solid Waste Management

The Georgia Rules for Solid Waste Management, Chapter 391-3-4 defines solid waste management regulations for businesses and individuals, including marinas.

BMPs derived from Georgia regulations include:

- Dispose of marina solid waste in “Municipal Solid Waste Landfills”.
- Use dustless-vacuum equipment and make it available to customers to rent.
- Use catchment/recycling equipment for pressure wash water.
- Steam cleaning over an impervious surface to collect and contain effluent.
 - a. If detergents or solvents are not used, an oil/water separator can allow effluent to meet sanitary sewer standards.
 - b. If detergents or solvents are used, an oil/water separator will not work. Treatment or recycling systems must be used and as industrial wastewater, this effluent may not discharge to a septic system.
- Conduct activities indoors or in an enclosed area over a surface designed to collect residues.
 - a. Use windscreens to collect and contain wind-borne residues.
 - b. Dispose of collected residues in a dumpster destined for an approved Municipal Solid Waste Landfill.
- For wastes that contain quantities of hazardous residues, contact the GA EPD for handling recommendations.

Construction and repair wastes:

- Recycle concrete as riprap if possible. (Must first remove wood and any exposed rebar. Cannot use painted concrete. It is not legal to cover riprap with soil).
- Asphalt cannot be used as riprap because of petroleum content.
- Dispose of treated timbers in a landfill. (Never burn CCA treated materials, arsenic may be transported by wind, remain in soil or runoff to surface waters).

Derelict boats:

- Saw up and transport to a landfill, unless it is feasible to clean properly for a DNR permitted artificial fishing reef application.

Nonhazardous Liquid Waste BMPs

Marinas should provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials. Be aware that some spent parts washer fluid, waste gasoline, and some highly flammable waste, solvents such as acetone are hazardous waste and must be handled as such. The goal is to minimize entry of potentially harmful liquid materials into marina and surface waters through proper storage and disposal. Marina operators are wastes, such as waste fuel, used oil, spent solvents, and spent antifreeze. Marina operators should decide how liquid waste is to be placed in the appropriate containers and disposed of. Customers should be informed on approved disposal techniques.

Georgia *does not* have a “liquid waste management rule”, except for those liquid wastes classified as hazardous. Generally, any nonhazardous liquid waste may be disposed of at a landfill, provided that the waste is in a form that does not allow free liquid to escape, and thus does not meet the definition of liquids.

BMPs for nonhazardous wastes:

- Nonhazardous liquid may be mixed and absorbed with sawdust or kitty litter type material.
- Place the mixture in a labeled, impervious container.
- Dispose of at an EPD approved landfill.

Note: A landfill cannot accept liquid wastes as per the State Solid Waste Management Rules, so any nonhazardous liquid wastes must be put in the above-described form.

Georgia *does* have specific guidelines for hazardous wastes which are addressed in the Georgia Hazardous Waste Management Act. Learn what constitutes a hazardous waste and handle any waste as hazardous until you know otherwise.

Area of Focus 4: Hazardous Waste Handling

Hazardous waste disposal is a more involved disposal process than for nonhazardous materials. You may be surprised at the amount of hazardous wastes you are disposing of in violation of the Georgia Hazardous Waste management Act- more than likely unintentionally on your part.

Recognize the Characterization of Hazardous Waste according to Georgia's Hazardous Waste Rules

Ignitability: It is easily ignited and has a flash point of less than 140° F. Examples of ignitable wastes are paint wastes (such as lacquer thinner), certain degreasers (such as naphtha and mineral spirits), gasoline, and other solvents (such as acetone).

Corrosivity: It dissolves metals and other materials, burns skin, and has a pH of less than 2, or greater than 12.5. Examples are waste rust remover, waste acid, alkaline cleaning fluids, and waste battery acid.

Reactivity: It is unstable or undergoes a rapid and/or violent change with water or other materials.

Toxicity: It is toxic as determined by laboratory testing. These wastes contain dangerous amounts of metals, pesticides, herbicides, and organic chemicals that could be released to groundwater. The list of toxic contaminants contains eight metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver), four pesticides, two herbicides, and 25 chemicals such as toluene and xylene.

A second class of hazardous wastes is defined as *Listed Hazardous Wastes*. Your waste is automatically classified as listed hazardous waste if it appears on any one of the four lists of hazardous wastes found in the hazardous waste regulations. These wastes have been listed because they practically always exhibit one or more of the hazardous waste characteristics described previously or contain any number of toxic chemicals that have been shown to be harmful to human health or the environment. The regulations list over 400 hazardous wastes.

Determine if Your Operation is Generating Hazardous Waste

- Assuming that waste is hazardous by applying product knowledge. Product knowledge may come from the Material Safety Data Sheet (MSDS); or
- Determine if the waste is listed as a hazardous waste; or
- Collect and send a sample of the waste to a laboratory for a hazardous waste characteristic determination.

If you determine a waste is listed as a hazardous waste, you do not need to have it tested for the four characteristics. Any waste that is determined to be nonhazardous and is not a liquid can be disposed of at a solid waste disposal facility permitted by the EPD.

- If you generate hazardous waste, determine your generator category:
 - Conditionally Exempt Small Quantity Generator:*** a CESQG is any generator of hazardous waste that produces a total of less than or equal to 220 lb. of hazardous waste in any calendar month.
 - Small Quantity Generator:*** a SQG is any generator of hazardous waste that produces a total of greater than 220 lb. and less than 2,200 lb. of hazardous waste in any calendar month.
 - Large Quantity Generator:*** a LQG is any generator that produces a total of 2,200 lb. or more of hazardous waste in any calendar month.
- Once you have determined your generator category, contact the GA EPD, Coastal District, Savannah Office, 6555 Abercorn Street, Suite 130, Savannah, GA, 31405 or the Brunswick office at 1 Conservation Way, Brunswick, GA, 31520 and request a copy of the "Notification of Regulated waste Activity" booklet. This booklet contains a form to be completed and returned to the GA EPD. You will receive an EPA location ID number and rules applicable to the amount of hazardous waste produced per month by your marina.

BMPs for Liquid Waste Storage Areas

- Build berms, curbs, or other barriers around areas used for the storage of liquid materials to contain spills. (Containment should handle 10% of the material stored or 110% of the largest container, whichever is greater).
- Routinely inspect storage areas for containment leaks (document inspections).
- Store materials in areas impervious to the type of material stored.
- Do not install drains in the floors of storage areas.
- Store wastes where they cannot come into contact with rainwater. Stormwater runoff can become contaminated by rain that comes in contact with storage areas.

BMPs for Liquid Waste Containers

- Provide separate containers for disposal of liquids and do not mix different liquids.
- Clearly label containers for contents.
- Cover containers in a manner that will prevent rainwater from entering the containers or spillage if the containers is overturned.
- Provide location and sufficient space between containers to allow visible inspections on a routine basis.
- Do not allow customers to deposit wastes directly into designated containers. Contaminated liquids may not be accepted for recycling and may have little or reduced value if being sold.
- Provide signs directing customers on disposal procedures and locations.

Area of Focus 5: Fish Cleaning

Fish Wastes are biodegradable, but improper disposal of fish waste can degrade water quality and cause odor and aesthetic problems. Fish waste should not be placed in areas that will degrade water quality. For example, fish waste may become trapped or washed ashore if disposed of in poorly flushed locations such as dead-end lagoons and in between docks.

BMPs

- Encourage fishermen to recycle fish wastes back into the ecosystem in a way that will not affect water quality or have other environmental impacts.
- Determine areas in the marina that do not flush well or may trap floating fish wastes. Place signs warning fishermen not to dispose of fish wastes in these areas.
- Designate fish cleaning sites and post waste disposal techniques at these sites.

Area of Focus 6: Boat Bilge Petroleum Control

Fuel and oil pollution from boat bilges can come from many sources, including sinkings, sloppy maintenance and repair procedures, engine and equipment leaks, oil line ruptures and careless fueling. Any discharge of contaminated bilgewater is the responsibility of the vessel owner or captain. The marina operator's duty is to ensure that the vessel owner or captain remains aware of this responsibility and to be prepared for the event of oily discharge.

BMPs

- Advise customers not to pump bilgewater overboard while in the marina unless they are sure it is free of all contaminants.
- Prohibit the discharge of petroleum in marina waters in dockage contracts.
- Advise boaters that they are liable for any pollutant discharged from their boat- even if they are not on board at the time of discharge.
- Post signs warning of prohibition of discharge of petroleum in marina waters.
- Through newsletters or fliers, educate customers on the prevention of petroleum spills into boat bilges, including proper preventative maintenance and how to contain and absorb small leaks.
- Recommend to customers that they dry bilges before an oil change.
- Promote and sell absorbent pads for use in bilges and outboard motor wells.
- Instruct boat owners on the proper disposal of used absorbent pads.
- Maintain an adequate inventory of absorbent booms and pads for the event of release of contaminated bilgewater from the marina's largest vessel.

Area of Focus 7: Boat Cleaning

Boat cleaning tends to be done by customers or marina employees wherever the boat is at the time. Cleaning operations include simple scrubbing of the decks or hull or pressure washing prior to painting. Many cleaning jobs require the use of chemicals, cleaners or petroleum-based products, all of which can be spilled or otherwise released into marina waters. Some jobs create potentially hazardous liquid and solid wastes that must be disposed of properly.

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Boat Cleaning BMPs

- Avoid major cleaning jobs over the water.
- Use non-alkaline phosphate-free biodegradable detergents. Phosphate is a plant nutrient. High phosphate levels, especially in poorly flushed water bodies, can lead to excessive algal growth, bacterial decomposition, low oxygen levels in the water, and fish kills.
- Discourage use of detergents containing ammonia, sodium hypochlorite, chlorinated solvents, lye or petroleum distillates.
- If boats are in the water:
 - a. Wash decks and hull regularly with plain water to minimize use of environmentally harmful cleaners.
 - b. Ensure no release of harmful cleaners or solvents into marina waters.
 - c. Do not use power scrubbers to clean hulls.
 - d. Do not clean hulls coated with sloughing paints.
 - e. Do not scrub hulls with excessive force as to actually remove the paint surface.
- Conduct activities ashore in a designated enclosed area over a surface designed to collect residues.
 - a. Place boat over a non-porous pad (unless the pad is designated to be porous with a catchment). This, in conjunction with a berm around the area, will aid in containment and cleanup.
 - b. Work should be done inside when possible to help contain contaminants and prevent rain from washing them into marina waters.
 - c. If wash water is non-toxic, use a porous material to catch debris while allowing water to flow through. Often non-porous tarps will allow debris to float off with high water volume.
 - d. Use windscreens to collect and contain wind-borne residues.
 - e. Use catchment/recycling equipment for pressure wash water.
- Steam clean over an impervious surface to collect and contain effluent.
 - a. If detergents or solvents are not used, an oil/water separator can allow effluent to meet sanitary sewer standards.
 - b. If detergents and solvents are used, an oil/water separator will not work. Treatment or recycling systems must be used and as industrial wastewater, this effluent may not discharge to a septic system.
- Design and place filter catchments (screen, filter cloth, hay bales) in storm drains in the wash area. *(Refer to Section 7.3 for catchment installation options).*
- Consider recycling wash water that has been screened, settled, filtered or treated for reuse as pressure wash water or for irrigation.
- Check with your sanitary sewer district if there is any question about system acceptance requirements for level of water purity.
- Dispose of collected residues, if eligible, in a dumpster destined for an approved landfill. *(Refer to Section 7.8 for eligibility information).*

Area of Focus 8: Sanitary Waste Management

Boat sewage when pumped overboard without proper treatment, introduces bacteria and nutrients into the water. Bacteria can lead to health problems in swimmers and shellfish consumers. Excess nutrients in the water can use dissolved oxygen through direct decomposition, or through stimulation of algal growth which may further deplete oxygen levels. The volume generated by the typical boat is not great, but when large numbers of boats are present, this waste can become significant. The Clean Vessel Act of 1972 makes it illegal to discharge untreated sewage overboard.

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There are four types of US Coast Guard approved toilets or Marine Sanitation Devices (MSD) for use on US waters. MSD types I and II are designed to treat the water for overboard discharge. MSD type III uses a holding tank and requires pumpout equipment. The fourth is portable toilet that must be carried ashore to empty. In addition to sewage, there is “graywater” which is discharge from sinks, laundry and showers. With population growth and increased boating activity, the availability of sanitary pumpout stations at marinas becomes more important. Additionally, marinas must educate customers about the importance of using the pumpout service and to encourage use by making the service user-friendly.

Boat Sewage BMPs:

- Require zero discharge of sewage into marina waters (dockage contract provision and signage).
- Provide a pumpout station to encourage the discharge of holding tanks ashore.

System options:

- a. Fixed Point System- One or more centrally located system, usually at the end of a pier or fuel dock.
 - b. Portable System- Portable or mobile systems are similar to the fixed-point system and are often used in their place at the fuel dock, but can be moved to a boat if necessary. The system is often most convenient, assessable and economical.
 - c. Dedicated Slipside System- Provides continuous wastewater collection at a slip
- Provide directions to the pumpout station, hours of operation and cost.
 - Provide a dump station for portable heads (head chemicals can damage your septic system).
 - Dispose of pumpout station waste into a municipal sewer system.
 - Do not dispose of pumpout station waste into a septic system unless it has been specifically designated for this purpose.
 - Promote the use of tank deodorants and disinfectants that are not harmful to the environment.
 - If your marina has no pumpout station, or for the event of your equipment being inoperative, advise customers of the nearest facility or mobile pumpout service.
 - Educate boaters via billing inserts or newsletters to use pumpout stations.
 - Encourage boaters to use shoreside restrooms, not boat heads. Provide adequate and clean restrooms.
 - Keep your pumpout station well maintained and in good working order. Regularly inspect the equipment and lines, log inspections and promptly arrange repairs.
 - Provide incentives for employees to promote and operate the pumpout station.
 - Provide BMPs for safe and sanitary operation of the station.

BMPs for Graywater from Galley and Bath:

- Reduce the amount of graywater produced by using marina facilities ashore.
- Use only biodegradable and phosphate free soaps or cleaners. Advise customers not to use soaps containing phosphate.
- Use as little amount of cleaner as possible.
- Scrub down the boat with no cleaner, with water only, more frequently.
- Look at the labels, buy only environmentally safe products; lemon juice, vinegar, baking soda, and elbow grease are safe ingredients. Avoid products that contain phosphate, sodium hydroxide, butoxyethanol, butylcellulose, and other toxic ingredients.
- If marina does not flush well, consider requiring boat graywater holding tank, which would be pumped out in the same manner as sanitary sewage holding tanks.

Area of Focus 9: Servicing Boats and Equipment

Your maintenance standards for marina vehicles, boats and equipment are a visible badge of the professionalism of management. Many customers view keeping these items clean and non-polluting as an indicator of your business’s commitment to safety and to the environment. This reflection can have a bearing on the environmental consciousness and actions of customers in your marina.

BMPs:

- Establish daily, weekly, and monthly inspection procedures for pollution prevention.



- Perform maintenance and repairs promptly, using appropriate maintenance area BMPs.
- Restrict operating and parking to areas designed for containing and collecting fluid spills.
- Provide drip trays or other containment wherever leaks could occur.

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Area of Focus 10: Herbicides, Pesticides, and Fertilizers

Grounds maintenance can result in the release of toxic substances and nutrients directly or indirectly into the surface water.

BMPs:

- Avoid or at least minimize the use of toxic herbicides or pesticides for weed and insect control.
- Use natural and sustainable gardening practices whenever possible.

Area of Focus 11: Retail Operations

The marina store is an excellent place to demonstrate commitment to environmental responsibility by promoting the use of environmentally compatible (friendly) products (e.g., degradable soaps) and practices (e.g., recycling, proper waste disposal). The promotion of environmentally-friendly products in your store makes the consumer more aware of what products they should and should not be using. The retail operation has the potential to impact the environment through practices of purchasing, selling, packaging and return, and recycling of specific used products.

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BMPs:

Purchasing

- Place purchasing emphasis on environmentally acceptable products
- Choose manufacturers and suppliers with environmental policies similar to your own.
- Manage inventories for shelf life, return policies, bulk buying, high-recycled content and durability.

Selling

- Know your products potential for environmental impact.
- Promote the sale of the following items:
 - a. Fuel and oil additives that increase engine efficiency reduce fuel consumption and decrease air emissions;
 - b. Recycled oil and anti-freeze;
 - c. Petroleum absorbent and fuel spill prevention products;
 - d. Bilge pump discharge filters;
 - e. Fuel-air separators for fuel tank vents;
 - f. Dustless sanders.
- Train staff on how environmentally safe products differ from traditional products.
- Promote environmentally acceptable products over others.

Packaging

- Buy in bulk.
- Reuse packaging.
- Request suppliers reduce packaging to a minimum for safe shipping and to ship in reusable containers.
- Sell or provide reusable cotton or canvas bags for customers.
- Sell bulk supplies (e.g., oil) for which customers can provide their own containers.

Returns

- Implement an exchange service policy to accept recyclable returns on:
 - a. Old batteries
 - b. Used antifreeze
 - c. Used oil and oil filters

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Area of Focus 12: Environmental Emergency Preparedness and Response

Emergency preparedness planning is a primary aspect of environmental management. Devastating consequences can result from the failure to properly respond to an emergency.

BMPs for Developing and Implementing an Emergency Response Plan

- *Assess the potential causes of emergencies.* Marina emergencies with environmental consequences include:
 - a. *Spills*
 - b. *Fire*
 - c. *Hurricanes*
 - d. *Boat sinkings*
- Write response plans for each type of emergency. Include pollution prevention measures. Each emergency requires different specific actions, but the sequence of actions will be similar for all.
- Train and inform employees and customers according to the written plan.
- Test the plan- preferably with just a drill, rather than a hurricane. Revise and upgrade it as necessary through lessons learned.
- Involve outside agencies in planning.
 - a. Invite the local fire department, emergency management agency and spill responders to visit your marina for familiarization with facility, operations and hazards. They need to know what to expect when responding to an emergency.
 - b. Coordinate response timing with agencies. For example, plan your hurricane preparation to parallel emergency management agency and evacuation schedules.
 - c. Provide the following pertinent information to the agencies:
 - Marina personnel contacts.
 - Marina site plan with locations of stored pollutants and information about pollutants stored on premises.
 - Specific information on how to access areas where pollutants are stored (e.g., gates, locks).
 - Material Safety Data Sheets for pollutants of concern in an emergency.
 - Storage methods (underground tank, glass containers, steel drums).
 - Amounts of pollutants (maximum amounts on daily and average basis and number of days on site per year).

BMP Elements for a Basic Emergency Response Plan

- First response actions by personnel on site.
- Reporting requirements.
- Detailed response actions for each type of emergency.
- Employee and management responsibilities defined.
- A site plan.
- Potential emergencies on site.
- Emergency response equipment inventory and locations.
- Emergency response services and contact numbers (oil spill clean-up, salvage companies, etc.).
- Emergency response agencies and contact numbers (fire department, police, Coast Guard, DNR, etc).
- Emergency response plan training and testing schedule.
- Emergency response equipment inspection and replenishment schedule.
- Records of training and equipment inspection.
- Disposal plans for collected spills and used absorbent materials.

Note: Your plan must be tested at intervals designed to allow the staff to become thoroughly familiar with the emergency procedures and equipment. It cannot be over-stressed that it is imperative to involve the agencies and companies that will be responding to actual emergencies in your emergency planning and training. Keep in mind, people first, property second.

Specific BMPs for a Major Spill on Shore (e.g., damage to a fuel storage tank)

- Stop or control the spill.
- Determine if any secondary containment is damaged.
- Cut off electricity in the vicinity of the spill if flammable.
- Inform the duty supervisor who will call the designated spill responder to be on standby or to mobilize.
- If secondary containment is absent or damaged:
 - a. Deploy containment booms to prevent flow toward marina waters or storm drains.
 - b. Construct temporary dikes to put covers on storm drains.
- If a chance exists that the spill will enter the water, notify the GA DNR and U.S. Coast Guard and adjacent facilities.
- When spill is contained, collect the liquid in suitable containers.
- If the volume of spill is excessive, contract removal with your spill responder.
- Dispose of used absorbent materials via your spill responder.
- If necessary have contaminated soil removed by an accredited clean up company.

Specific BMPs for a Major Spill on Water

- Identify the source of the spill.
- Stop or control the spill (fuel shutoff valves, etc).
- Determine the size and drift of the spill and quantities involved.
- Cut off electricity in the vicinity of the spill.
- Inform the duty supervisor who will call the designated spill responder to be on standby or to mobilize.
- Notify the GA DNR and U.S. Coast Guard and adjacent facilities *immediately*.
- **For small gasoline spills (less than 5 gallons):**
 - a. Allow gas to evaporate naturally
 - b. Isolate electricity from spill vicinity
 - c. Do not attempt to contain or collect gasoline because of risk of fire/explosion
 - d. Spray the sheen with water to hasten evaporation
- **For larger gasoline spills:**
 - a. Take steps above as with small spills
 - b. Evacuate everyone from spill vicinity
 - c. Contact the fire department
 - d. Call your spill responder to contain and remove the gasoline
- **For other petroleum spills:**
 - a. Immediately deploy absorbent booms to prevent the spill from spreading. Surround the source if possible.
 - b. Once the spill is contained, apply additional absorbents as necessary
 - c. Call your spill responder to contain and remove the absorbed liquids and the used absorbent materials.
- Keep boat traffic clear of the area to prevent wakes from interfering with spill response efforts.

Environmental BMPs for Fire Response

- Evacuate neighboring boats from the docks and clear the docks.
- If the fire involves any release of pollutants into the water, respond according to your spill response plan.
- Close all fuel supply line valves in the vicinity.

Environmental BMPs for Hurricane Preparation

Hurricane preparation requires a tremendous amount of advance planning. The marina and boats must be prepared to weather the storm early enough to allow evacuation of personnel according to Emergency management Agency schedules. Consequently, hurricane BMPs to prevent water pollution must be done well before the threat of a hurricane.

- Design the dock fuel supply for shut-off and easy disconnect at the land/water interface. This can minimize impacts due to storm action ripping the supply lines loose.

- Remove all oils and other pollutants from the fuel dock and dock boxes.
- Encourage boaters to evacuate boats from the marina to minimize sinkings.
- Keep waste and recyclable containers empty during hurricane season.
- Move retail inventory and maintenance use pollutants to safety.
- Fill underground fuel storage tanks to minimize fuel contamination from rising waters and, if necessary, to prevent the tanks from floating.
- Cap fuel tank vents and secure fill openings.

Environmental BMPs for Boat Sinkings

- Deploy containment booms around the vessel or in as large a circle as possible if the boat is in deep water.
- Once the spill is contained, apply additional absorbents as necessary.
- Call your spill responder to contain and remove the absorbed liquids and the used absorbent materials.
- Call your salvage operator to begin raising and removal of the vessel.

Boat Operation Management BMPs

The operation of boats in the shallow waters of marina can adversely impact habitat. Boat wash can resuspend bottom sediment, resulting in the reintroduction of toxic substances into the water column. It can increase turbidity, which hinders photosynthesis by submerged aquatic vegetation. Submerged aquatic vegetation provides habitat for marine life and plays an important part in maintaining water quality through assimilating nutrients. Submerged aquatic vegetation also reduces wave energy, protecting shorelines and bottom habitats from erosion and is difficult to reestablish once it is uprooted.

BMPs:

- Exclude motorized vessels from areas that contain shallow water habitat.
- Establish and enforce no-wake zones to decrease turbidity.

Training for Pollution Prevention

Throughout this manual in every area of marina operation, there has been reference to training employees, customers and outside contractors for a successful BMP program. ***Training is the key and it is the toughest part of implementing and maintaining a program. Protecting our natural environment needs to become a state of mind or an attitude.*** Training has to begin with a thorough explanation of the problem and lead to an understanding of the need for environmental protection. Continual reinforcement must follow to instill the understanding that each of us is part of our ecology and responsible for its protection.

The activities of marina employees, customers and subcontractors have direct impact on the environment. However, marina management must understand these activities and related impacts in order to modify management techniques to minimize those impacts. Employee BMP training must be a structured part of management policy and be an ongoing part of personnel development. Also, management must lead by example and provide the equipment and materials necessary to support the policy.

Outside contractors working on site on customers boats or marina equipment must be made aware of and to comply with marina environmental policies. Outside contractors should have to sign an agreement-before being allowed to begin work- to comply with marina policies and to be financially responsible for the consequences of their actions.

Customer education is best achieved by seeing marina management and employees setting a good example in following established environmental BMPs. People respond voluntarily when in an environment that is operated and managed with care. Dockage contracts and marina regulations should make the formal introduction to marina BMP policies. Seminar, fliers, signs and newsletters can serve to develop an understanding and appreciation of marina environmental issues and related BMPs.

BMPs for Employee Training

- Involve every employee in an environmental audit of marina activities.
- Ask each to list potential environmental impacts from their job.
- Discuss the findings as a group.
- Use this manual as a basis for further audit of potential problems and solutions.
- Request employee BMPs suggestions and evaluate those and those in this manual as a group before implementing.
- Reward environmental initiatives.

Note: In addition to these general BMP training techniques, there are operations and emergencies that require very specific training. For example, training for BMPs regarding fueling, sanitary wastes, maintenance techniques and for emergency response to fire, hurricane or spills requires standard written information and hands on use of the equipment and materials involved.

BMPs for Outside Contractor Training

- Provide contractors copies of your marina BMP policy information that pertain to the work they do on site.
- Do not allow work to begin without a signed Outside Contractor Agreement.
- Do not allow any activities that do not follow marina BMP policies.
- Ask customers to be selective when choosing an outside contractor.

BMPs for Customer Training

- Tell your customers about your BMP program through newsletters and/or an addendum to dockage contracts or marina regulations.
- Explain any changes this will mean in the daily operations of the marina.
- Regularly provide BMP information sheets with billings and in newsletter articles.
- Invite customer feedback on the program and ask for suggestions on better environmental protection at the marina.
- Emphasize the need for their cooperation and encourage their participation.
- Offer environmental seminars.

Host events for environmental fisheries organizations that will foster environmental ethics.



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