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Clean Boating Tip Sheet: Petroleum Control



Petroleum Control

Environmental Concerns

Petroleum in or on the water is harmful and, in some cases, fatal to aquatic life. Benzene, a carcinogen, is in gasoline. Oil contains zinc, sulfur, and phosphorous.

Once petroleum is introduced into the water, it may float at the surface, evaporate into the air, become suspended in the water column, or settle to the sea floor. Floating petroleum is particularly noxious because it reduces light penetration and the exchange of oxygen at the water's surface. Floating oil also contaminates the microlayer. The microlayer refers to the uppermost portion of the water column. It is home to thousands of species of plants, animals, and microbes. The abundance of life in the microlayer attracts predators: seabirds from above and fish from below. Pollution in the microlayer, thus, has the potential to poison much of the aquatic food web.

Legal Setting

Federal Water Pollution Control Act (Clean Water Act)

Because of the harm associated with petroleum, the discharge of oil is absolutely prohibited. The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of \$5,000.

The United States Coast Guard and the Texas General Land Office must be notified any time a spill produces a sheen on the water. Call the National Response Center at 1-800-424-8802 and the Texas General Land Office at 1-800-832-8224. Report the location, source, size, color, substance, and time of the spill. Failure to report a spill may result in fines.

The Clean Water Act (33 CFR 153.305) also prohibits the use of soaps or other dispersing agents to dissipate oil on the water or in the bilge without the permission of the Coast Guard. Soaps, emulsifiers, and dispersants cause the petroleum to sink in the water column and mix with sediments where they will remain for years. Also, the soaps themselves are pollutants. You may be fined up to \$25,000 per incident for the unauthorized use of soap or other dispersing agents on the water or in the bilge.

Best Management Practices for Preventing Spills at the Source

Protect Petroleum Storage Tanks.

Fuel storage tanks at marinas typically hold from 1,000 to 10,000 gallons of fuel. If a tank was to rupture or develop a leak, the consequences could be devastating.

- Install double-walled or vaulted above ground fuel tanks. Tanks should meet the following conditions (NFPA 30).
 - a. The capacity of the tank shall not exceed 12,000 gal (45,420 L).
 - b. All piping connections to the tank shall be made above the normal maximum liquid level.
 - c. Means shall be provided to prevent the release of liquid from the tank by siphon flow.
 - d. Means shall be provided for determining the level of the liquid in the tank. This means shall be accessible to the delivery operator.
 - e. Means shall be provided to prevent overfilling by sounding an alarm when the liquid level in the tank reaches 90 percent of capacity and by automatically stopping delivery of liquid to the tank when the liquid level in the tank reaches 95 percent of capacity. In no case shall these provisions restrict or interfere with the proper functioning of the normal or emergency vent.
 - f. Spacing between adjacent tanks shall be not less than 3 ft. (0.9 m).
 - g. The tank shall be capable of resisting the damage from impact of a motor vehicle or suitable collision barriers shall be provided.
 - h. Where the interstitial space is enclosed, it shall be provided with emergency venting.
- Alternatively, locate above ground fuel tanks within a dike or over an impervious storage area with containment volumes equal to 1.1 times the capacity of the storage tank(s). Design containment areas with spigots to drain collected materials. If possible, cover the tank with a roof to prevent rainwater from filling the containment area. The control of any stormwater that collects in the diked area must be addressed as a condition of your TNRCC Industrial Permit for Discharges from Marinas.

Careless engine maintenance, refueling habits, and improper disposal of oil and contaminated bilge water release more oil into marine water each year than did the Exxon Valdez spill (Clifton et al. 1995a).

- Design and construct all new oil storage tanks (USTs) to the technical standards as stated in TAC 334.45 These standards include but are not limited to corrosion protection, spill and overfill prevention equipment, and leak detection.
- Upgrade existing USTs to the state standards.
- Install a readily accessible shut-off valve on shore to halt, when necessary, the flow of fuel through a pipeline from the oil storage facility to a wharf, pier, or dock.
- USTs must meet financial responsibility requirements (i.e., insurance) for environmental pollution liability.
- Contact the TNRCC for assistance with installation or plan review. All underground storage tanks must be registered with the TNRCC.

Avoid Waves and Wakes.

- Locate fuel docks in areas protected from wave action and boat wakes when constructing new or upgrading existing facilities. For safety reasons, all fueling stations should be accessible by boat without entering or passing through the main berthing area.
- Provide a stable platform for fueling personal watercraft (PWC). You may purchase prefabricated drive-on docks or modify an existing dock by cutting a v-shaped berth and covering it with outdoor carpeting. Consider placing the PWC fueling area at the end of the fuel pier to reduce conflict with larger boats.

Maintain Fuel Transfer Equipment.

- Inspect transfer equipment regularly and fix all leaks immediately.
- Maintain transfer equipment and hoses in good working order. Replace hoses, pipes, and tanks before they leak.
- Hard connect delivery nozzles.
- Hang nozzles vertically when not in use so that fuel remaining in hoses does not drain out.

Install Environmental Controls at the Pumps.

- Do not install holding clips. The use of holding clips to keep fuel nozzles open is illegal at marina fuel docks.
- Install automatic back pressure shut-off nozzles on fuel pump discharge hoses to automatically stop the flow of fuel into a

boat's fuel tank when sufficient reverse pressure is created.

- Consider installing fuel nozzles that redirect blow-back into vessels fuel tanks or vapor control nozzles to capture fumes.
- Maintain a supply of oil absorbent pads and pillows at the fuel dock to mop up spills on the dock and on the water.
- Place plastic or nonferrous drip trays lined with oil absorbent material beneath fuel connections at the dock to prevent fuel leakage from reaching the water.

A single pint of oil released onto the water can cover one acre of water surface area (Buller 1995).

- Post instructions at the fuel dock directing staff and patrons to immediately remove spilled fuel from the dock and water with oil absorbent material. Indicate the location of the absorbents.
- Place small gas cans in oil absorbent-lined drip pans when filling.
- Secure oil-absorbent material at the waterline of fuel docks to quickly capture small spills. Look for oil absorbent booms that are sturdy enough to stand up to regular contact with the dock and boats.
- Offer your services to install fuel/air separators on boats.

Supervise Fueling: Environmental Recommendations.

- Always have a trained employee at the fuel dock to oversee or assist with fueling.
- Train employees to clarify what the boater is asking for. For example, as your employee passes the fuel nozzle to the boater, have him or her say, "This is gasoline. You asked for gasoline."
- Train employees to hand boaters oil absorbent pads with the fuel nozzle. Request that the boaters use them to capture backsplash and vent line overflow.
- Attach a container to the external vent fitting to collect overflow. There are products on the market that may be attached to the hull with suction cups. A rubber seal on the container fits over the fuel vent allowing the overflow to enter the container. Fuel captured in this manner can be added to the next boat to fuel.
- Instruct fuel dock personnel and boaters to listen to filler pipes to anticipate when tanks are nearly full.
- Encourage boaters to fill their fuel tanks just before leaving on a trip to reduce spillage due to thermal expansion and rocking,

i.e., if the fuel is used before it warms up, it cannot spill overboard.

- If boaters prefer to refuel upon their return to port, encourage them to fill their tanks to no more than 90 percent of capacity.
- Instruct boaters to slow down at the beginning and end of fueling.
- Require boaters to stay with their craft during fueling.

Supervise Fueling: Safety Recommendations.

- Always have a trained employee at the fuel dock to oversee or assist with fueling.
- Remind boaters that gasoline vapors are heavier than air; they will settle in a boat's lower areas.
- Require all passengers to get off gasoline powered vessels before fueling.
- Instruct boaters to:
 - Stop all engines and auxiliaries
 - Shut off all electricity, open flames, and heat sources
 - Extinguish all cigarettes, cigars, and pipes
 - Close all doors, hatches, and ports
 - Maintain nozzle contact with the fill pipe to prevent static spark
 - Inspect bilge after fueling for leakage or fuel odors
 - Ventilate all compartments after fueling until fumes are gone
- Train dock staff to carefully observe fueling practices; make sure fuel is not accidentally put into the holding or water tank.

Turn Down the Pressure.

Problems with backslash and vent-line overflow are often due to the high pressure flow of fuel from the pump.

- Ask your fuel company representative to reduce the pressure. Anybody dispensing more than 10,000 gallons per month must have a delivery rate of less than 10 gallons/minute.

The person fueling the vessel, generally the boater, is liable for all penalties associated with spilled fuel.

Oil Absorbent Material

Oil absorbent pads, booms, and pillows absorb hydrocarbons and repel water. Depending upon the type, they may hold up to 25 times their weight in oil. These types of products are useful for capturing spurts at the fuel dock, cleansing bilge water, and wiping up spills in engine maintenance areas.

There are a number of new twists on basic oil absorbent materials. One new variety of oil absorbent boom captures oil from the bilge and solidifies into a hard rubber bumper. Other types contain microbes that digest the petroleum. The oil is converted to carbon dioxide and water. Because the microbes take 2 to 3 weeks to digest a given input of oil, it is not appropriate to use these types of products for a spill of any significant size. Rather, they are designed to control the minor drips associated with routine operations. Care must still be taken that free floating oil is not discharged overboard.

Yet another type of oil absorbent product is a boom constructed out of oil absorbent polypropylene fabric and filled with dehydrated microbes. These booms hold the petroleum in the fabric until it is digested by microbes. Threats associated with free floating petroleum are thereby minimized.

How you dispose of used oil absorbent material depends on what type of product it is and how it was used:

- Standard absorbents that are saturated with gasoline may be air dried and reused.
- Standard absorbents saturated with oil or diesel may be wrung out over oil recycling bins (if they are saturated with oil or diesel only!) and reused. Alternatively, they should be double bagged — one plastic bag sealed inside of another — and tossed in your regular trash.
- Bioremediating bilge booms may be disposed in your regular trash as long as they are not dripping any liquid. Because the microbes need oxygen to function, do not seal them in plastic bags.

Oil absorbent materials, such as pads (left), booms (center), and pillows (right) absorb up to 25 times their weight in oil while repelling water.

Advocate the Use of Oil Absorbent Materials.

- Distribute pads, pillows, or booms to your tenants.
- Require tenants to use oil absorbent materials as part of your lease agreement.

Provide an Oil/Water Separator.

- Invest in a portable or stationary oil/water separator to draw contaminated water from bilges, capture hydrocarbons in a filter, and discharge clean water.

Offer Spill-Proof Oil Changes.

- Purchase a non-spill pump system to draw crankcase oils out through the dipstick tube. Use the system in the boat shop and rent it to boaters who perform their own oil changes.
- Slip a plastic bag over used oil filters prior to their removal to capture any drips. Hot drain the filter by punching a hole in the dome end and draining for 24 hours. Recycle the collected oil. Recycle the metal canister if practical. If not, place in plastic double bag and dispose in your regular trash.
- Encourage the use of spill-proof oil change equipment as a condition of your slip rental agreement.

Minimize Spills and Leaks from Machinery.

- Use non-water-soluble grease on Travelifts, fork lifts, cranes, and winches.
- Place containment berms with containment volumes equal to 1.1 times the capacity of the fuel tank around fixed pieces of machinery that use oil and gas. The machinery should be placed on an impervious pad. Design containment areas with spigots to drain collected materials. Dispose of all collected material appropriately. Refer to the Waste Containment and Disposal section of this guidebook. If possible, cover the machinery with a roof to prevent rainwater from filling the containment area.
- Place leak-proof drip pans beneath machinery. Empty the pans regularly, being conscientious to dispose of the material properly (uncontaminated oil and antifreeze may be recycled).
- Place oil-absorbent pads under machinery.

Educate Boaters.

- Photocopy the Clean Boating Tip Sheet included at the end of this chapter and distribute it to your tenants. There is room to add your marina's name and logo.

Best Management Practices for Emergency Planning

Prepare a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

- The Environmental Protection Agency's Oil Pollution Prevention Regulation requires that marinas prepare and implement a plan to prevent any discharge of oil into navigable waters or adjoining shorelines if the Facility:
 - has an above ground oil storage capacity greater than 660 gallons in a single container,
 - an aggregate above ground storage capacity greater than 1,320 gallons,
 - or a total underground storage capacity greater than 42,000 gallons.

Oil is defined in the SPCC regulations (40 CFR 112) as "oil of any kind or in any form, including but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil and oily mixtures."

- The plan must address:
 - operating procedures implemented by the facility to prevent oil spills,
 - control measures installed to prevent a spill from entering navigable waters or adjoining shorelines, and
 - countermeasures to contain, cleanup, and mitigate the effects of an oil spill that impacts navigable waters or adjoining shorelines.
- The SPCC plan must be certified by a professional engineer and kept onsite for EPA review. If a single spill of greater than 1,000 gallons occurs or two discharges of harmful quantity occur within one year, a copy of the SPCC plan must be submitted to EPA Region VI.

Assess Hazards.

- Consider and plan for likely threats:
 - fuel spill
 - holding or water tank filled with gas
 - spill at the storage area: used oil, antifreeze, solvents, etc.
 - fire
 - health emergency
 - hurricane, etc.

Develop Emergency Response Plans.

- Develop written procedures describing actions to be taken under given circumstances. The plans should be clear, concise, and easy to use during an emergency, e.g., use a large type size. Each emergency response plan should contain the following information:

Where:

- In the very front of the plan, insert a laminated 11 by 17 inch site plan of the facility showing valves, pipes, tanks, structures, roads, hydrants, docks, power and fuel shutoffs, hazardous material storage locations, and telephones.
- Describe where response material is located.

Who:

- Identify who is responsible for taking what action, e.g., deploying equipment, contacting emergency agencies, etc.
- Designate one person on the marina staff as the official spokesperson for the facility.
- Include a list of emergency phone numbers: for marine spills, U.S. Coast Guard's National Response Center (800) 424-8802, Texas General Land Office (800) 220-5005; for spills in a non marine environment, Regional TNRCC Office (713) 767-3563 M - F 8:00 am - 5:00 PM, (512) 463-7727 after hours; local fire and police departments, owner, neighboring marinas that have emergency response equipment, and spill response contractors.
- Include a brief description of each agency's jurisdiction and information about what type of equipment and services are available from neighboring marinas and spill response firms.

What:

- State what action should be taken during an emergency and, based on likely threats, what equipment should be deployed. Include information about what type of equipment is available on site and what its characteristics and capabilities are.
- Characterize the facility's waterfront and vessels.
- Describe the type, amount, and location of materials stored on site, e.g., petroleum and hazardous materials.

How:

- Explain how the equipment should be used and disposed.

When:

- Indicate when additional resources should be called for assistance.

- Update the plans annually to include any new technology or equipment and to confirm phone numbers.

Make Plans Accessible.

- Keep copies of all Emergency Response Plans in a readily accessible location.
- Place a second copy of the Oil Spill Response Plan (SPCC) in the oil spill response kit.

Train Employees.

- Review plans and response procedures with staff at the beginning of each boating season.
- Train employees in the use of containment measures.
- Run emergency response drills at least twice annually.
- Invite the U.S. Coast Guard and local fire department to demonstrate emergency response procedures at your marina.

Share Your Emergency Response Plans.

- Inform your local fire department and harbor master, if applicable, about your emergency response plans and equipment.
- Let neighboring marinas know what resources are available at your marina.

Maintain Oil Spill Response Equipment.

- Maintain enough oil spill response equipment to contain the greatest potential spill at your facility.
- Store enough boom to encircle the largest vessel in your facility. Vessel length x 3 = required length of boom.

Store Oil Spill Response Equipment Smartly.

- Store the equipment where the greatest threat of an oil spill exists: fuel receiving and fuel dispensing areas.
- Store materials in an enclosed container or bin that is accessible to all staff — especially those who handle the fueling operations. Mark the storage site with a sign reading “Oil Spill Response Kit”. Include instructions for deploying pads and booms and notification that all spills must be reported to the USCG at (800) 424-8802 and Texas GLO (800) 832-8224 for marine spills; TNRCC (512) 463-7727 for non marine spills.
- Consider leaving the storage container unlocked so that it is available to patrons, as well as to staff. If leaving the bin un-

Fuel Spill

What do you do when oil, gas, or diesel is spilled?

1. Stop the flow.
2. Contain the spill.
3. Call the U.S. Coast Guard's National Response Center at (800) 424-8802 and Texas GLO (800) 832-8224 for marine spills; TNRCC (512) 463- 7727 for non marine spills.

Failure to report spills to the Coast Guard may result in civil penalties.

If less than a gallon is spilled and you clean it up immediately, the Coast Guard will probably not send anybody to your facility. The spill is still a violation, however.

Call the Coast Guard if a slick floats into your marina from an unknown source. The Coast Guard will clean up the spill with their own resources. They will also investigate and try to eliminate the source of the spill. You will not be held liable for a slick that did not originate at your facility.

locked at all times is not palatable, try leaving it unlocked just on weekends and holidays when both activity and risk are greatest.

- If the bin is left unlocked, check the inventory regularly.

Be Prepared for a Fire.

- Meet the National Fire Protection Association's standards for marinas: NFPA 303, Fire Protection Standards for Marinas and Boatyards; NFPA 302, Fire Protection Standards for Pleasure and Commercial Motor Craft; NFPA 30A, Automotive and Marine Service Station Code; NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves; and NFPA 33, Standard for Spray Application Using Flammable and Combustible Materials.
- Be sure hydrants are available to allow for fighting fires throughout your facility.
- Install smoke detectors.
- Provide and maintain adequate, readily accessible, and clearly marked fire extinguishers throughout the marina, especially near fueling stations.
- Inspect and test all fire fighting equipment and systems regularly. Test fire extinguishers annually.
- Train personnel on fire safety and response: who to call, location

of hydrants, use of portable extinguisher, etc.

- Provide ready access to all piers, floats, and wharves for municipal fire fighting equipment.
- Invite the local fire marshal to visit your marina annually to train employees. These annual visits will also help the fire department to become familiar with your facility.

Maintain Material Safety Data Sheets.

- Keep a file of Material Safety Data Sheets (MSDS) for all products used at your facility, as required by the Occupational Safety and Health Act of 1970 (29 USC Sec. 657). Store the file in an office away from material storage areas. Keep in mind during an emergency that this file will not tell you what quantity is on site or even whether all the materials listed are present.
- Inform the local Emergency Planning Committee what materials you store and what is released when they burn.

Information Sources

Appendix

Texas Natural Resource Conservation Commission

- Hazardous Waste Program

- Oil Control Program

Texas General Land Office

National Fire Protection Association

United States Coast Guard

United States Environmental Protection Agency, Region VI

Clean Boating Tip Sheet

Petroleum Control

Petroleum in or on the water is harmful and, in some cases, fatal to aquatic life. Floating petroleum is particularly bad because it reduces light penetration and the exchange of oxygen at the water's surface. Floating oil also contaminates the microlayer. The microlayer refers to the uppermost portion of the water column. It is home to thousands of species of plants, animals, and microbes. The abundance of life in the microlayer attracts predators: seabirds from above and fish from below. Pollution in the microlayer, thus, has the potential to poison much of the aquatic food web.

The Law

The Federal Water Pollution Control Act (also called the Clean Water Act) prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of \$5,000 from the U.S. Coast Guard. State law also prohibits the discharge of oil. The TNRCC may also impose fines.

Fueling Practices

Gas or diesel may be spilled during the act of fueling: as backsplash out the fuel intake or as overflow out the vent fitting. Spills of this sort harm aquatic life, waste money, and can result in stains on the hull and damage to the gel coat and striping. Follow these tips to avoid problems:

- Fill tanks to no more than 90 percent capacity - gas that is drawn from cool storage tanks will expand as it warms up onboard your vessel.
- To determine when the tank is 90 percent full, listen to the filler pipe, use a sounding stick, and be aware of your tank's volume.
- Rather than filling your tank upon your return to port, wait and fill it just before leaving on your next trip. This practice will reduce spills due to thermal expansion because the fuel will be used before it has a chance to warm up.
- Fill portable tanks ashore where spills are less likely to occur and easier to clean up.
- Use oil absorbent pads to catch all drips.

- Slow down at the beginning and end of fueling.

Bilge Maintenance

Engine oil tends to accumulate in bilges. If no precautions are taken, the oil is pumped overboard along with the bilge water. Discharging oily water is illegal. To avoid fines and to protect water quality, follow these tips:

- Keep your engine well tuned to minimize the amount of oil that is released. Be sure there are no leaking seals, gaskets, or hoses.
- Place oil absorbent materials or a bioremediating bilge boom in the bilge.
- Place an oil absorbent pad under the engine.
- Replace oil absorbent materials regularly.
- Look for contractors or marinas that offer a bilge pumpout service.
- Do not treat oily water with detergents. Soaps pollute and make clean up impossible. You may be fined up to \$25,000 for using soaps to dissipate oil.

Disposal of Oil Absorbent Materials

The disposal of used oil absorbent material depends on what type of product it is and how it was used:

- Standard absorbents that are saturated with gasoline may be air dried and reused.
- Standard absorbents saturated with oil or diesel may be wrung out over oil recycling bins (if they are saturated with oil or diesel only!) and reused. Alternatively, they should be double bagged with one plastic bag sealed inside of another and tossed in your regular trash.
- Bioremediating bilge booms may be disposed in your regular trash as long as they are not dripping any liquid. Because the microbes need oxygen to function, do not seal them in plastic bags.

Emissions Control

Marine engines — especially 2-stroke outboard motors — produce the highest average level of hydrocarbon exhaust emissions after lawn and garden equipment. Hydrocarbon emissions contribute to ground level ozone, a known health risk. Follow these tips to help your engine operate as efficiently as possible:

- Use the gas to oil ratio recommended by the engine manufac-

turer. Too much oil can foul spark plugs and too little can lead to increased engine wear or even failure.

- Use premium two-cycle engine oil (TC-W3 or TC-W4). Premium oils improve engine performance and reduce pollution because they burn cleaner, contain more detergents, and prevent formation of carbon deposits.
- Use gasoline with the octane level recommended by the engine manufacturer.

Preventive Equipment

Products are available commercially which can help you prevent spills and reduce emissions:

- Install a fuel/air separator along your vent line. These devices allow air, but not fuel, to escape through a vent opening.
- Attach a safety nozzle to portable gas cans used to fill outboard engines. These nozzles automatically stop the flow of fuel when the receiving tank is full.
- To prevent oily bilge water from being discharged, install a bilge pump switch that leaves an inch or two of water in the bilge. Alternatively, connect a bilge water filter to your vessel's bilge pump. Filters will remove oil, fuel, and other petroleum hydrocarbons from the water.
- When it is time to buy a new engine, select a fuel efficient, low emission model.

In Case of a Spill

- Stop the flow.
- Contain the spill.
- Call the U.S. Coast Guard National Response Center at (800) 424-8802.
- Call the Texas GLO (800) 832-8224 for marine spills; TNRCC for non marine spills at (713) 767-3563 and after hours, call (512) 463-7727.

