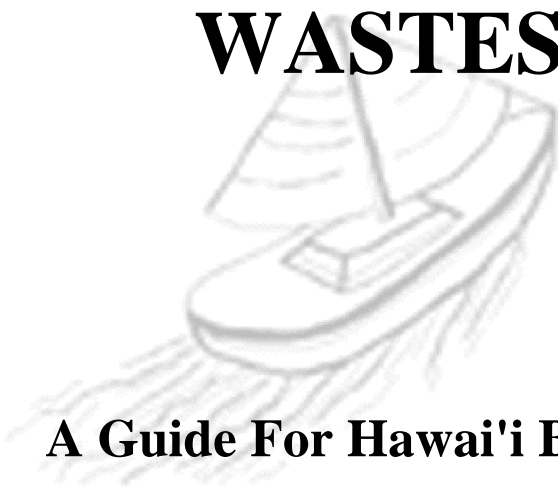




MANAGING BOAT WASTES



A Guide For Hawai'i Boaters



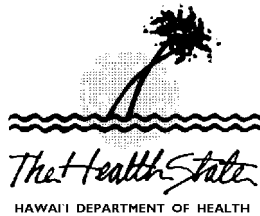
UH Sea Grant College Program
School of Ocean and Earth Science and Technology

Office of Solid Waste Management, Department of Health

Division of Boating and Ocean Recreation
Department of Land and Natural Resources

Contents

Alternatives to Toxic Products	1
Bilge Water	2
Boat and Deck Washing	3
Head Sewage	4
Fuel	5
Fuel Spills	7
Lead Acid Batteries	8
Marine Debris	9
Paints/Varnishes/Epoxies/Etc	10
Solvents	11
Used Oil	12
Used Oil Filters	13
Acknowledgments	14
Useful Phone Numbers	15
Debris or Litter Issues	16



The Hawaii Department of Health, or any advisor or employee thereof, is not liable for any information, error, representation, or makes any warranty, expressed or implied, as to the accuracies of any materials, services, products, or suggestions discussed in this publication.



This is a joint effort of the UH Sea Grant College Program, School of Ocean and Earth Science and Technology; the Department of Health, Office of Solid Waste Management; the Department of Land and Natural Resources, Division of Boating and Ocean Recreation, and the Pollution Prevention Center for Islands.



This is funded by a grant in part from the National Oceanic and Atmospheric Administration, project #A/AS-1, which is sponsored by the University of Hawaii Sea Grant College Program, SOEST, under Institutional Grant No. NA36RG0507 from NOAA Office of Sea Grant, Department of Commerce. The views expressed herein are those of the author(s) and do not necessarily reflect the views of NOAA or any of its sub-agencies. UNIHI-SEAGRANT-MB-98-01.

Alternatives to Toxic Products For Cleaning Your Boat

Bleach	Borax or hydrogen peroxide
Detergent & Soap	Vegetable- or citrus-based soaps instead of petroleum-based soaps and detergents
Scouring Powders	Baking soda
Floor Cleaner	1 cup of white vinegar in 2 gallons of water
Window Cleaner	1 cup of white vinegar in 1 quart of warm water, rinse and squeegee
General Cleanser	Bicarbonate of soda and vinegar; lemon juice combined with borax paste
Head Cleaner	Pour in baking soda and use brush
Shower Cleaner	Wet surface, sprinkle on baking soda, and scrub
Aluminum Cleaner	2 tablespoons of cream of tartar in 1 quart of hot water
Brass Cleaner	Worcestershire sauce or paste made of equal parts salt, vinegar, and water
Copper Cleaner	Lemon juice and salt
Chrome Cleaner / Polish	Apple cider vinegar to clean/baby oil to polish
Fiberglass Stain	Baking soda paste
Drain Opener	Use boiling water and plumbers snake or disassemble; substances should not be used in a through-hull drain
Mildew Remover	Paste using equal parts of either lemon juice and salt or vinegar and salt
Furniture Polish	3 parts olive oil and 1 part white vinegar
Wood Polish	Almond or olive oil (interior wood only)
Hand Cleaner	Baby oil or margarine

Do:

U Use alternatives!! They work - and can save you money!

Don't:

Y Do not allow hazardous household products to enter the water. These products may have the potential to cause explosions, may be corrosive, may catch fire, or may be poisonous to living things.

Bilge Water

It is not uncommon to see a small fuel sheen on the water surface near boats. Although it may only be a tiny amount from some boats, the long term impacts can be damaging. Once in the marine environment, oils and fuels have a tendency to collect in the bottom sediments and concentrate in marine organisms. These harmful substances commonly enter the marine environment through bilge pumping, fueling and improper response to spills.

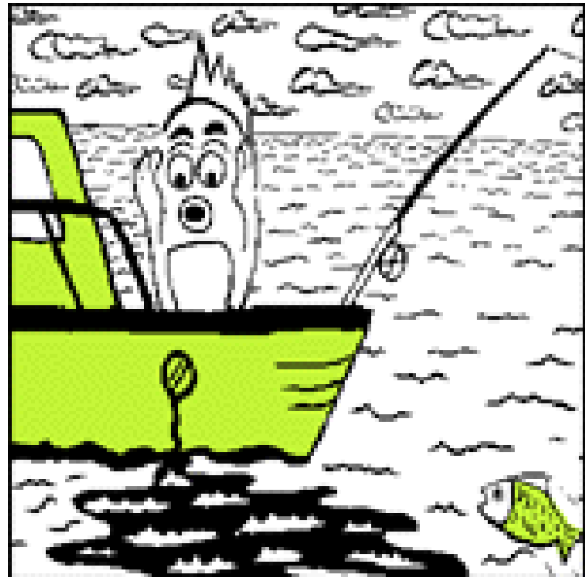
Many oil spills occur unintentionally when automatic float switches activate because of rain, slow seepage, or other causes of mild water ingress. To avoid these oil spills, raise the float switch a couple of inches. This will allow the bilge pump to discharge water, but keep the oil in the boat until it can be disposed of properly.

Do:

- U Fix small leaks that allow oil to drip into the bilge.
- U Take extra care when you change your oil.
- U Use oil-absorbent pads to capture surface oil. Make sure the oil is completely absorbed. Dispose of used pads in trash.
- U Raise the bilge pump automatic float switch enough to keep any oil-contaminated bilge water aboard until it can be pumped to a clean container.

Don't:

- Y Don't ever drain engine oil into the bilge.
- Y Don't put off repairs to engine and fuel tank leaks.
- Y Don't disable automatic bilge pumps while doing engine repairs.
- Y Don't turn on bilge pumps before ensuring that the bilge is clean.
- Y Don't dispose of used oil except at an approved waste reception facility.
- Y Don't use dispersants such as dish soaps. Dispersants do not remove oil from the water, they only break it down into small, hard to see drops.
- Y Don't discharge bilge water if there is a sheen to it.



Boat and Deck Washing

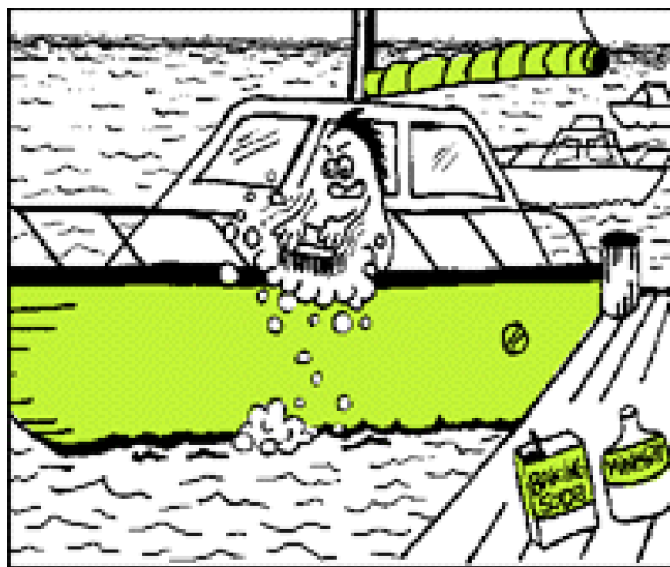
Every time we wash our decks with soap, we contribute to water pollution. Many soaps and detergents still contain phosphates. Phosphates promote algae growth which, in turn, robs the water of essential oxygen. Without oxygen, fish cannot survive. In addition, algae growth prevents light from penetrating the water and limits aquatic photosynthesis. Many soaps and detergents also contain substances that bind to living tissue. When these substances bind to fish gills, the fish lose their ability to absorb oxygen and therefore suffocate. Detergents can also contain heavy metals that accumulate through the food chain.

Do:

- U Rinse and scrub your boat with a brush after each use. The safest cleaning product available is good, old-fashioned "elbow grease."
- U Try to buy alternative products that do not contain phosphates if you need to use cleaning agents.
- U Use non-toxic biodegradable cleaners.
- U Use hose nozzles that shut off when released and conserve water and reduce the runoff from boat washing.

Don't:

- Y Don't use cleaners that contain ammonia, sodium, chlorinated solvents, petroleum distillates, or lye.
- Y Don't clean the bottom of your vessel by scraping or scrubbing it while it is still in the water.



Head Sewage

Human sewage from boats is a potentially dangerous source of water pollution that can contain disease-causing organisms that affect marine animals and plants.

The Federal Water Pollution Control Act requires that recreational boats with installed toilet facilities use Coast Guard certified Marine Sanitation Devices, or MSDs. MSDs include any equipment for installation on a vessel which is designed to receive, retain, treat, or discharge sewage, and any process to treat sewage. Marine Sanitation Devices are designed to prevent the overboard discharge of untreated sewage, and they come in three types:

1. Type I MSDs: A device that under test conditions produces an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 milliliters and no visible floating solids.
2. Type II MSDs: A device that, under test conditions produces an effluent having a fecal coliform bacteria count not greater than 200 per 100 milligrams per liter.
3. Type III MSDs: A device that is designed to prevent the overboard discharge of treated or untreated sewage or any waste derived from sewage. The holding tank is equipped with piping to discharge waste when over three miles from shore or, preferably, into fixed or floating pump-out facilities.

Boats longer than 65 feet must use Type II or III, while boats less than 65 feet can use I, II, or III. All installed MSDs must be Coast Guard certified if the boat is to be in compliance. Boats without installed toilets should use a port-a-potty and:

1. Dispose of the sewage in the sanitary sewer on shore;
2. Use rest rooms/portable toilets ashore whenever possible. Holding tank additives: Type I and Type II MSDs require holding tank additives. They come in a variety of forms and chemical compositions - some of which may be harmful to parts of your toilet system as well as the environment. Read the label carefully to make sure that the products contain no formaldehyde, formalin, phenol derivatives, ammonia compounds, alcohol bases, or chlorine bleach.

All live-aboard vessels in the State of Hawai'i small boat harbors must have a Type I, II, or III MSD.

At the current time the following small boat harbors have pump out facilities: O'ahu: Ala Wai Small Boat Harbor, Wai'anae, Hale'iwa, He'eia Kea; Maui: Lahaina; and Kaua'i: Nawiliwili.

Do:

U Know the MSD requirements.

U Use pump-out facilities. Hawai'i boaters are required to do so.

Don't:

Y Don't dispose of fats, solvents, oils, emulsifiers, disinfectants, paints, poisons, phosphates, diapers, or other similar products in MSDs.

Fuel

The best way to minimize the environmental impact of fuel is to use less! When possible, try to observe the following tips to reduce fuel consumption.

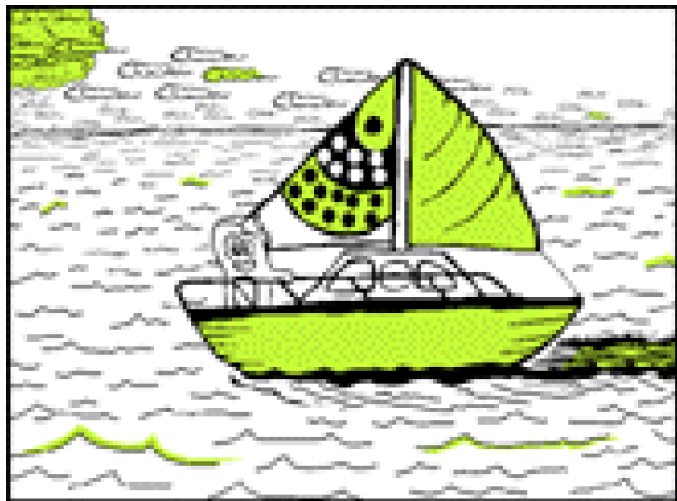
Do:

U Conserve.

U Have sails? Hoist them when winds are right.

U Balance your load. This enables your boat to get on plane quickly (only applicable for planing-type hulls) and reach the desired speed without plowing or porpoising.

U Watch the weather. Avoid false starts if prevailing air and sea conditions are questionable. Brisk winds and heavy chop siphons the fuel from the tanks.



U Check your propeller. A damaged prop will waste fuel. Keep propeller blades clean and in good condition. Replace props that have damaged blades. Also, adjust diameter and pitch to your vessel's design (check with engine manufacturer).

U Avoid excess idling. Whenever you have to stop, turn off the ignition. A warm engine restarts easily without choking.

U Slow down. A wide open throttle can increase fuel consumption by 50 percent or more over mid-range speeds. As you "trim" the boat, maintain rpms at the level recommended by the manufacturer.

U Watch your weight. The lighter the boat and its load, the less horsepower you will need to propel it and the greater your fuel economy. Drain the bilges and holding tanks properly

before departure. Store unneeded supplies and equipment ashore.

- U Plan your trip. A true course is the shortest, the shortest distance not necessarily the shortest time, depending on sea conditions. Any reduction in running time saves fuel.
- U Check the tides. Boating against the tide is like running against the wind - it takes more effort. Make the tides and currents work to your advantage. Reduce wind resistance by keeping canvas bow shelters and bimini tops down and furled until needed.
- U Clean your hull. The less growth on your hull, the less underwater drag there will be on your boat and the less fuel you will use.
- U Keep the engine tuned. Proper ignition timing and clean spark plugs assure extra mileage. Inspect the carburetor for proper float level, correct jetting, and smooth choke operation. Check the fuel and oil filters regularly. Alcohol-based fuel can cause loss of fuel by deteriorating fuel lines. Call your boat manufacturer to find out if your engine can take alcohol-based fuel. Part of engine maintenance should include an inspection of the fuel lines and carburetor gaskets. Replace bad lines with USCG Type A alcohol-resistant fuel line hose.
- U Consider a 4-stroke! Small outboard 2-stroke engines pollute much, much more than the new 4-strokers.
- U Listen to the filler pipe to anticipate when the tank is full and to avoid back-splash.
- U Stop pumping at the first sign of fuel escape.
- U Prevent spillage from tank vents, install a fuel/air separator or an air whistle in your tank's vent line.
- U Install fuel tank vents high enough to prevent spills during fueling and rough weather.

Fuel Spills

The use of dispersing agents such as dishwashing liquids is more harmful to the environment than if the oil was left alone. Use of dispersing agents without the approval of the Captain of the Port is in violation of federal laws; the civil penalty is up to \$25,000.

Any fuel spill (gas, oil, diesel, etc.) that leaves a sheen on the water must be reported to the U.S. Coast Guard at 522-8260 (927-0830 after hours) 1-800-424-8802 (24 hrs) or the State's Hazard Evaluation and Emergency Response (HEER) office at 586-4249 or 226-3799 (after business hours). There is no lower limit to the amount of fuel spilled to trigger a call to the Coast Guard or HEER. You must call the Coast Guard to report a spill no matter how small.

Harbors	Sewage Pumpout	Oil Disposal Facility
O'ahu, Existing:		
Ala Wai Small Boat Harbor	x	
He'eia Kea Small Boat Harbor	x	
Kane'ohe Bay Yacht Club	x	x
Ke'ehi Lagoon Small Boat Harbor	x	x
Wai'anae Small Boat Harbor	x	
Rainbow Bay Marina	x	x
O'ahu, Proposed:		
Ewa Marina	?	?
Kaua'i, Existing:		
Nawiliwili Small Boat Harbor	x	
Port Allen Small Boat Harbor		x
Maui County, Existing:		
Lahaina Small Boat Harbor	x	x
Ma'alaea Small Boat Harbor		x
Hawai'i County (Big Island), Existing:		
Honokohau Small Boat Harbor		x

Existing and proposed sewage and oily waste facilities in Hawai'i: Ewa Marina, a proposed private facility, is projected to have 1,400 berthing slips, ramps and 500 boats in dry storage. Kaneohe Yacht Club, also privately owned, currently berths 160 boats and holds 150 in dry storage with launch ramps. Rainbow Bay Marina, federally owned and located in Pearl Harbor, currently berths 83 boats, has 19 mooring spaces filled with 58 boats in dry storage and ramps for launching. Twenty-six liveaboards use this facility. Rainbow Bay Marina is expanding to 180 berthing spaces by July of 1998, when a sewage pumpout and oil disposal facility is also proposed. There are no facilities that have more than one sewage pumpout or oil disposal facility.

Lead Acid Batteries

Hawai'i Law (Hawai'i Revised Statutes 342I) prohibits the disposal of lead acid batteries in landfills or abandonment on public or private property. Batteries whose electrolyte has been removed will not be accepted for recycling. Lead Acid Batteries contain two hazards: lead and acid. When released into the environment, these materials can contaminate the air, water, and soil. Also, lead can be assimilated by animals and plants, and eventually find its way into the food chain and drinking water supply. When ingested or contacted by humans, lead and acid can cause both short and long term health problems.



Do:

- U When you buy a new battery, return the old one to your vendor. The law requires the vendor to accept it.
- U Store batteries upright in a secure place and check battery and caps often for leaks.
- U Contact the Department of Health, Office of Solid Waste Management, at 586-4240 to report vendors who don't comply. If you have an old battery, contact your local mechanic or parts store.
- U Anyone who sells batteries in Hawai'i is required to take your old battery when you buy a new one.

Don't:

- Y Don't dispose of a battery in the garbage, at a landfill, or on public or private property.
- Y Don't break open the case and/or remove the acid or lead.
- Y Don't store batteries outside; the weather can damage them.

Marine Debris

The ocean is not a dump! Marine debris - plastic, nets, fishing lines, six-pack rings, Styrofoam, etc. - can kill marine life. When seabirds, whales, and other marine creatures ingest plastic they often become sick and die. They can also become entangled in nets or six-pack rings and drown. In 1987, the United States ratified an international treaty addressing the problem of ships dumping their garbage at sea. The treaty, known as Annex V of MARPOL (Marine Pollution Act):

1. Prohibits the disposal of plastics anywhere in the ocean;
2. Restricts the disposal of most other types of refuse materials depending on distance to shore.

In addition, the U.S. Coast Guard requires:

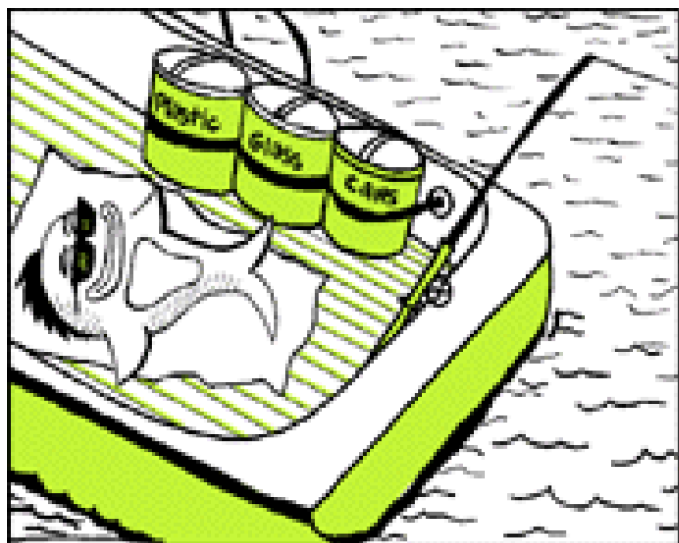
1. Vessels 26 feet and over to prominently display a placard to notify all passengers and crew of Annex V discharge rules and penalties;
2. Vessels 40 feet and over to display the discharge rules placard and prepare a written waste management plan.

Do:

- U** Keep all waste on board in proper receptacles. Separate plastics, cans, and glass for recycling. Properly manage your debris so that it will not be blown or washed overboard.
- U** Avoid expensive boat engine repairs - keep your trash out of the water! Boat engines can be damaged when propellers or cooling water intakes become entangled with nets and other marine debris.
- U** Contact the Coast Guard at 522-8260 (927-0830 after hours) to report violations.
- U** Choose reusable items rather than disposables.

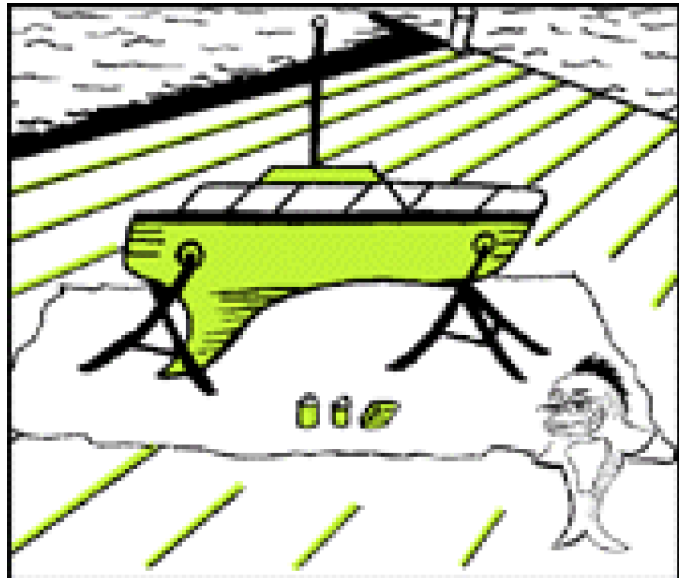
Don't:

- Y** Don't discard any garbage overboard.
- Y** Don't discard any plastic over the side.



Paints/Varnishes/Epoxies/Etc.

Paints come in two basic forms: water-based and oil-based. Water-based paints are considered less dangerous than oil-based paints, which contain carcinogenic solvents that if inhaled, ingested, or absorbed through the skin, can impact human health. The growth of marine organisms on hulls is a common problem faced by boaters. Many bottom paints are designed to self-slough, which means they shed their outer layer and carry away unwanted growth. In addition, many bottom paints contain anti-growth toxins which, when leached into the water, can accumulate in marine organisms. Eventually, these toxins find their way back to us in the fish that we eat.



Do:

- U** Buy only what you need! Mix only what you need! Prepare paints over a drop cloth on land, not on the dock.
- U** Use, or make sure your boat yard uses, the most environmentally friendly bottom paints available. Ask your vendor to stock "green" products.
- U** Scrape and paint your boat away from the water. Plug the scuppers and wipe up any spills or residues.
- U** Use drop cloths, pans, containment trays, etc. to catch paint scrapings and drippings. Dispose of wastes in the trash. Allow empty paint cans to dry out before throwing them away.
- U** Scrub the hull periodically to extend the useful life of the paint.

Don't:

- Y** Don't scrub the hull periodically to try to extend the useful life of the paint while in the water. This is a "reportable" spill.

Solvents

Most solvents are hazardous because they are flammable and/or toxic. They are, however, commonly used in many boat maintenance products such as resin, paint, paint remover, varnish, shellac, and thinner. When working with solvents, avoid skin contact and ensure vapor inhalation.

Do:

- U Use alternative products! Ask your vendor to stock environmentally friendly alternatives!
Recycle your own solvent! Let the spent solvent settle until it clears. Decant the liquid portion through a filter. Dispose of the filter in the trash.
- U Keep spent solvent in separate, labeled containers.

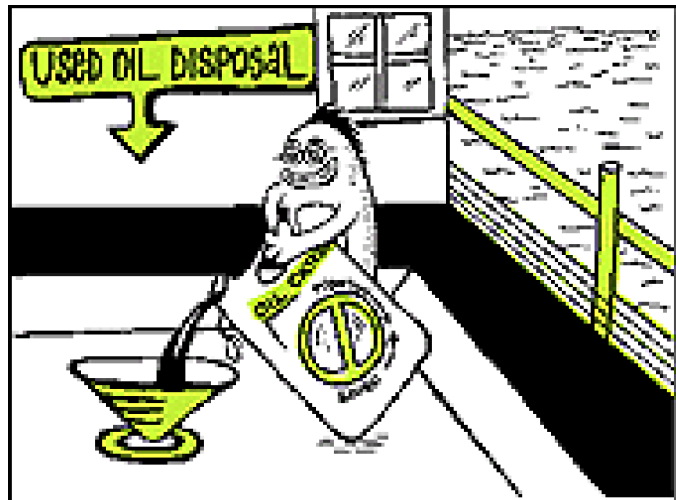
Don't:

- Y Don't mix solvents with used oil!
- Y Don't let solvents drain to septic tanks, storm drains, or sewers.



Used Oil

Hawai'i law 342J (formerly Hawai'i Revised Statutes 342N) prohibits used oil from entering into streams, the ocean, storm drains, sewers, or the ground. Also, if used oil is contaminated with a hazardous waste, the whole mixture becomes a hazardous waste. If improperly managed, used oil is a dangerous pollutant. Just one quart of oil can contaminate 250,000 gallons of water, and can injure fish, birds, and other aquatic life. In addition, used oil contains toxic components that can cause cancer and other diseases in humans.



Do:

- U Store your oil in a clean, air tight container.
- U Use oil absorbent products to contain any accidental spills or when you change your oil.
- U Bring your uncontaminated used oil to a collection facility or recycling center. Contaminated used oil will not be accepted.

Don't:

- Y Don't mix used oil with solvents, thinner, paint, anti-freeze, fuel or other hazardous substances.

Used Oil Filters

Used oil filters contain some waste oil. The oil may drain out and cause environmental contamination when disposed in landfills. Some local service stations recycle oil filters. If you can't find one that does, drain the filter into the used oil pan for 24 hours and place the filter in a plastic bag and put into the trash. Absorb the oil for disposal or recycle it with the greater volume.

Do:

- U Drain filters into your used oil.
- U Drain at an angle, for 24 hours, while oil is still hot.
- U Dispose of empty oil filters in trash.

Don't:

- Y Don't throw away abandoned filters -- drain them first!



We wish to thank the following organizations for providing source material for this publication:

Baywatch: A Guide for Boaters (1991), published by The Environmental Health Coalition in San Diego (619-235-0281).

Soundwatch: An Environmental Guide for Boaters (1993), published by 48 North, The Sailing Magazine; The California Department of Boating and Waterways.

Managing Hazardous Wastes, produced by Thurston County Public Works in cooperation with the Washington State Department of Ecology.

Environmental Guide for New England Mariners (1989), produced by the Coalition for Buzzards Bay. Boaters Guide to Clean Water and Good Times (1988), published by Washington.

The Hawaii Guide to Alternatives & Disposal of Household Hazardous Wastes, produced by the State of Hawaii Department of Health, Environmental Health Administration, Office of Solid Waste Management.

What Boaters Can Do to be Environmentally Friendly, produced by West Maui Watershed Advisory Committee, Lahaina Harbor-Mala Wharf Advisory Committee and the Hawaii Department of Health Boating Clean & Green (1996), Marine County Hazardous and Solid Waste Management Authority, Office of Waste Management State Parks and Recreation Commission.

Rhode Island Sea Grant, Boater Fact Sheet Puget Soundkeeper: A Boater's Guide to Sound Information, published by The Puget Sound Alliance under a grant from the Municipality of Metropolitan Seattle (METRO) and the Washington State Department of Ecology.

We wish to thank the following individuals for reviewing and/or providing information for this publication:

John Harder, Carrie McCabe, Department of Health, Office of Solid Waste Management, Melissa Ihori, Department of Health, Environmental Planning Office

Wendy Wiltse, Environmental Protection Agency

Peter Rappa, Chris Woolaway, Priscilla Billig, and Aaron Lee of the University of Hawai'i Sea Grant College Program

Skippy Hau, Department of Land and Natural Resources, Division of Aquatic Resources, Jim Schoocraft, and Pearlyn Fukuba, Department of Land and Natural Resources, Division of Boating and Ocean Recreation

Capt. Frank Whipple, Captain of the Port U.S. Coast Guard, U.S. Coast Guard Marine Safety Office, Honolulu

Kent Richards, U.S. Coast Guard District 14, Recreational Boating

Ray Pendleton, Mid Pacific Information

If you have any comments or questions, please contact the Department of Health, Office of Solid Waste Management, (808) 586-4240.

The Hawaii Department of Health, nor any advisor or employee thereof, is liable for any information, error, representation, or makes any warranty, expressed or implied, as to the accuracy of any materials, services, products, or suggestions discussed in this publication.

Useful Phone Numbers

O'ahu numbers given (unless otherwise noted).

Abandoned Boats/Boating Registration DLNR - Division of Boating & Ocean Recreation (DOBOR):

O'ahu: 587-1963

Kaua'i: 245-8028

Maui: 243-5824

Hawai'i: 329-4215

Moloka'i: 553-5105

Lana'i: 264-0233

Boating Mishaps Involving Injury

Fire Dept: 911

DLNR - Division of Conservation & Resources Enforcement: 587-0077

Channel 16 VHF

U.S. Coast Guard: 522-8260 (927-0830 after hours) or 1 (800) 424-8802 (24 hours)



Debris or Litter Issues

The Governor's Committee for a Beautiful Hawaii: 538-3166

EMERGENCY Hazardous Material Spill or Leak

Fire Dept: 911; U.S. Coast Guard-Marine Safety Office: 522-8260 (927-0830 after hours) or 1(800) 424-8802 (24 hours)

Fuel and Oil Spills National Response Center: 1(800) 424-8802

Hazards to Navigation U.S. Coast Guard: 522-8260

Injured/Stranded Marine Animals, Sea Turtles, Sea Birds National Marine Fisheries Service (NMFS): 973-2987 (mammals), 943-1276 (turtles)

Dept. of Land & Natural Resources (DLNR) Division of Conservation and Resource Enforcement (DOCARE): 587-0077

Ocean Dumping of Plastic, Garbage, Paper, and other marine debris U.S. Coast Guard: 522-8260

Sewage Spill/Infectious Waste

24 hour Sewage Spill Notification

County of Hawai'i: 961-8338

City & County of Honolulu: 523-4423

County of Kauai: 241-6610 or 241-6851

County of Maui: 243-7465

Other Spills/Infectious Waste

Dept. of Health, Hazard Evaluation and Emergency Response Office
586-4249; after hours 247-2191