# Camp And Houseboat Sanitation In Louisiana



Sandy Corkern
J. David Bankston

## Camp and Houseboat Sanitation In Louisiana

BY
Sandy Corkern
J. David Bankston

LSU AgCenter

Produced by the Louisiana Sea Grant College Program



LSU's Sea Grant College Program is part of the National Sea Grant College Program maintained by the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. Sea Grant, a unique partnership with public and private sectors, combining research, education, and technology transfer for public service, is the national network of universities meeting changing environmental and economic needs of people in our coastal, ocean, and Great Lakes regions. Louisiana Sea Grant is also supported by the state of Louisiana. June 2002.

Louisiana Sea Grant College Program Communications Office 101 Sea Grant Building Louisiana State University Baton Rouge, LA 70803-7507 (225) 578-6448 or 578-6449 Web Site: http://www.laseagrant.org

#### Acknowledgments

The authors would like to acknowledge the advice and assistance provided by Joan Adams and James Antoon of the Louisiana Department of Health and Hospitals.

## **CONTENTS**

INTRODUCTION	l
WASTEWATER TREATMENT METHODS	2
Septic Tanks	2
Mechanical Treatment Systems	4
Limited Use Systems	4
Composting and Incineration	
OPERATION AND MAINTENANCE	5
Operational Hints	5
Maintenance Hints	6
REGULATIONS	6
Vessels	6
Land Camps	8
Summary	8
RESOURCES	9
Parish Sanitarians	9
Agent and Specialists, LSU Agricultural Center	12

#### INTRODUCTION

Louisiana has a long history of camp and houseboat usage by both recreational and commercial groups - especially in the coastal and swamp regions of the state. Until the middle of this century, fur trappers and their families lived in marsh camps for the duration of the trapping season, skinning and preparing the fur for market. At the end of trapping season they moved back to town or to the communities where they lived for the rest of the year. Some of these camps also served as year-round residences for families who subsisted on commercial fishing during the summer months. Croatian immigrants living in the extreme southeastern region of Louisiana also used oyster camps. During the cooler months of the year entire families lived in the camps, and in the other months, the men stayed intermittently in the camps as they tended their oyster leases. The "ghosts" of these camps are still evident along many waterways in Plaquemines Parish.

Camps were and still are used as bases for hunting and fishing activities with family and friends. Many, if not most, of these tend to become "specialized" according the interests of the camp owners. Thus, there are "deer camps," "duck camps," etc. A significant, and seemingly increasing, number of camps are focused on family activities, and tend to be used more frequently and by greater numbers of people than traditional "hunting" camps. While hunting and fishing may play a part in camp usage, so do water sports, picnicking, and simply relaxing.

Geographically, camps may be grouped into coastal marsh camps, swamp camps (the greatest concentration being in the Atchafalaya Basin), and upland camps that are located near lakes and rivers in areas away from the coast. While camp activities vary in these locations, the constant is that the camps are located on soils that are, to a greater or lesser degree, hydric. That is, they are subject to occasional saturation with water and often have high moisture content.

Houseboats, by definition, are on the water, and indeed they are found on practically every bayou, river, stream, and lake in the state. Although historically some commercial fishing families lived on houseboats, their usage now is entirely recreational, with activities similar to those associated with wetland camps. Houseboats in Louisiana, even the most elaborate ones, tend to be "homemade" and follow no specific construction design. The one constant is that most have no treatment systems for their discharges. Although houseboats can move from one location to another, many owners choose to keep them moored in a marina or at some other location for most or all of the year.

Camps and houseboats have traditionally discharged directly into the waters or wetlands near them. These waters and wetlands have an amazing ability to absorb these discharges, as they contain organic compounds that can be used by plants as nutrients, but this practice may cause problems as more camps and houseboats are built.

Camp and houseboat discharges are regulated by both state and federal agencies and by legislation as well as departmental regulations. While Louisiana Sanitary Code 13:004-1 prohibits the discharge "...into any road, street, gutter, ditch, water course, body of water, or onto the surface of the ground," as will be explained later, the laws and regulations are not as straightforward as all that.

Wastewater is classified as either "gray water" or "black water". Gray water is the wastewater associated with dish washing, bathing/showering and clothes washing. The normally low levels of nitrates and phosphates in this water seldom cause water quality problems. Black water is the effluent from toilets and urinals containing human waste. Black water contains a high load of organic material and may also contain harmful bacteria and other pathogens.

Discharges from human sources can cause problems such as *eutrophication*. When high levels of nutrients such as nitrogen and phosphorus are introduced into water, they cause an initial growth spurt or "bloom" of algae and other plants. When this bloom dies, it decays and uses up much or most of the available dissolved oxygen in the water, creating a hypoxic or low- oxygen situation. Eventually , the animals and plants that live in the water must either move to areas with more dissolved oxygen or die. Eutrophication is a natural process but is aggravated by human activities.

Human discharges may also contain pathogens, which are micro-organisms that cause diseases in humans. Although there are naturally occurring pathogens in some waters (for example, Vibrio vulnificus), untreated discharges can add to the problem. These pathogens include bacteria, protozoans, and viruses, and can be contracted while swimming, through cuts and abrasions, or by eating contaminated foods. The Hepatitis A virus, Salmonella, Norwalk virus, and others can be introduced into the water by improperly treated sewage. While most of these may cause mild to moderate symptoms such as diarrhea, nausea, vomiting, and fever in most people, other individuals may become severely ill or even die.

In addition to environmental and health hazards, there are also aesthetic and economic impacts from degraded water quality. Businesses that cater to swimming, tubing and canoeing enthusiasts can be severely affected when waterways are closed because of contamination. The oyster industry is faced with significant economic loss when harvesting areas are closed by contamination. Fishing guides, marinas, and sporting goods stores also suffer when degraded water quality affects fish populations. Moreover, there is a definite, but difficult to quantify, loss of tourism dollars in areas of poor water quality.

#### WASTEWATER TREATMENT METHODS

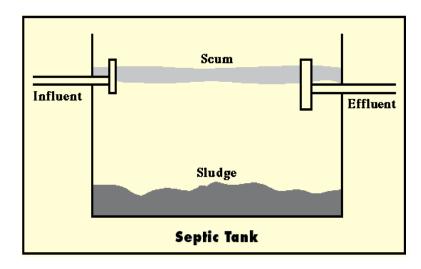
The correct system for your particular application depends not only on your site but also on how you will be using it. The better the information you have on intended use, and the better you know your site characteristics, the better a system can be matched to your needs. Work with your parish sanitarian to determine which system will work best for you.

#### SEPTIC TANKS

Gravity separation and filtration are two common physical separation methods. The old stand-by for individual wastewater treatment systems - the septic tank and leach field - employs gravity separation in the septic tank, filtration in the leach field, and biological

treatment in both. Septic tanks are designed to allow solid materials to settle to the bottom of the tank and oils to float to the top, leaving three levels of waste: bottom sludge, floating scum, and waste water. The effectiveness of the gravity separation depends upon the design and size of the tank, the conditions inside the tank (such as the amount of sludge), and the quantity of wastewater that flows into the tank. Although a baffle to direct the water flow is an optional feature, all tanks have some means of limiting the effluent flow to only wastewater.

In the tank illustrated, a tee at the exit controls the effluent flow. This tee admits wastewater at its bottom, below the scum layer and above the sludge layer. Too great a buildup of scum or sludge can cause solids or oils, rather than just wastewater, to flow out the tank, and the system can fail. As a general rule,



the tank needs pumping if the scum layer is within three inches of the top of the tee, the sludge layer is within 12 inches of the bottom of the tee, or the scum layer plus the sludge layer take up more than half the tank's capacity. When this happens, water is likely to flow through the tank before the oils and solids have a chance to separate and either float to the top or settle to the bottom.

The tank capacity required for a camp is based on the expected amount of wastewater flowing into the tank, and that is calculated from occupancy and normal use patterns. Abnormally large flows, either because of more people or greater than normal use per person, can result in insufficient separation time, carry through of oil and solids in the effluent, and failure of the system. The physical separation of the oil and solids from the wastewater stream, combined with bacterial action on the wastes in the water, results in a waste stream with a concentration of nutrients low enough to be adequately treated by a suitable secondary treatment system. The buildup of the sludge and scum layers is slowed by bacteria, which feed on nutrients in the solids, liquefying the majority of the material in the tank. These bacteria are better at reducing the sludge layer than the scum layer.

Wastewater from a septic tank is typically discharged through perforated distribution piping in the leach field and allowed to percolate into the soil. A leach field is intended to distribute wastewater to the soil in such a manner that the soil does not become saturated,

as saturation would result in an anaerobic condition. The pipes are commonly placed in a bed of gravel to allow better distribution and an aerated condition. Aeration is important because aerobic bacteria (those that require oxygen) are more efficient than those that don't (anaerobic) and they do not produce the offensive odors that anaerobic bacteria do. The soil provides secondary treatment by allowing micro-organisms to feed on the nutrients and bacteria in the wastewater. This conventional septic tank system depends on bacteria and micro-organisms to treat the waste. Thus, for the system to work correctly, there must be an adequate population of bacteria and microorganisms. A steady food supply (wastewater) and conditions suitable to microbial growth and survival will assure an adequate population.

Conventional septic tank systems are only effective in areas where the soil is adequately porous to allow percolation of liquids (but not so porous that the wastewater flows to the groundwater where no treatment can occur) and the groundwater level is low enough to avoid contamination. Many of the soils where camps are located are not suitable for conventional septic systems. Several alternatives to the leach field have been used in areas that are not suitable for leach fields. These include the mound system and oxidation ponds.

A mound system can be thought of as a leach field built above ground. Since it is usually higher than the septic tank, a pump

must be used to move the effluent from the septic tank to the mound. The mound system, like the leach field, is not suitable for all locations, such as places where the soil has too high a clay content to allow proper percolation or the area is subject to inundation.

An oxidation pond must be at least 400 feet square and comply with approved design criteria, such as a four-to-five-foot average liquid depth and vertical side walls. The pond must be enclosed with a suitable nonclimbable fence at least five feet high and be provided with a locked gate to keep out children, pets, and livestock.

If septic tank systems are properly maintained and used in areas where conventional systems are compatible with soil types, they are a very efficient method of waste treatment. Because of Louisiana's high water table, heavy rains, and widespread clay soils, conventional septic tank systems are not effective in many areas, particularly in hydric soils where most camps are located. Septic systems are also unsuitable for use with houseboats. The unsanitary conditions that may result from improper septic tank system maintenance or use in incompatible soils can cause health and environmental problems. Even with a properly designed and installed system, solids accumulate over time and, if not removed, will overflow the septic tank and clog the distribution lines. This creates the potential for overloading the soil's capacity to properly treat the sewage. Periodic maintenance and cleaning of these systems are necessary to prevent

potential overloading of the soil's treatment capacity. As only 13 percent of the soil in Louisiana is capable of allowing the proper percolation of waste from conventional septic tanks, it is important for people to use systems that are designed to be compatible with the area's geological attributes.

#### MECHANICAL TREATMENT SYSTEMS

Individual mechanical treatment plants have been developed for special conditions such as found at camps. These systems still rely on physical separation and biological treatment. They consist of a multi-compartmented tank in which the first compartment acts as a septic tank, the second is an aeration chamber, and the third, a final settling chamber. The partially treated sewage from the first compartment flows into the aeration chamber where it is further treated by aerobic bacteria and other microorganisms. An aerator is used to bubble air through the liquid in this chamber and to keep the sewage well mixed. This results in rapid biological treatment of the wastes. The final chamber allows remaining solids to settle out and to return to the aeration chamber.

One variation of this design includes a chlorination chamber. Depending upon the location and application, no further treatment may be required. The systems must be state-approved and installed by licensed installers. They must also be maintained to be sure that the aerator is operating and that it is pumped out as needed. As a biological system, a

mechanical treatment plant depends upon an adequate population of bacteria and microorganisms. A steady food supply and conditions suitable to microbial growth and survival are necessary. In addition, some method must be provided to substantially reduce the volume of effluent discharged from the premises. At current rates, the energy costs of these systems vary greatly from about \$3 per month for the newer, more efficient systems to \$30 per month in some of the older mechanical systems.

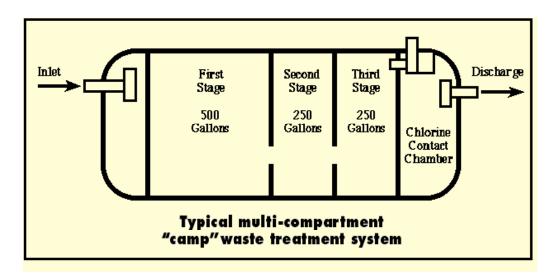
#### LIMITED USE SYSTEMS

A highly variable input can present a challenge for sewage treatment systems. Intermittent use, such as that typical of camps, can severely affect the ability of the system to treat the waste both biologically and to some extent physically. Intermittent use means that the biological organisms face periods of feast and famine, and because of the famine (periods of low use) there may not be sufficient population to fully treat the wastes during feast times (periods of high use). Intermittent use can also mean great variability in wastewater flows. For example, a camp that normally houses two or three people on weekends may play host to several times that number on special occasions. If the treatment system is not designed to accommodate these larger flows, it can fail.

Because of these problems, treatment systems have been developed for intermittent use. In Louisiana, the correct term for them is "limited-use systems," although they are often referred to as camp systems. A limited-use sewerage system is one that is authorized by the State Health Officer for installation or use at a structure or dwelling occupied less than four days in a week, and the use of which generates less than 100 gallons per day of sanitary sewage. Both mechanical and nonmechanical systems are approved. Both feature a requirement that the treated wastewater leaving the system be chlorinated in a suitable contact chamber.

A typical limited-use nonmechanical system consists of either multiple tanks in series or a tank with multiple compartments. A multi-compartment tank might have an entry chamber followed by a 500-gallon and two 250-gallon compartments in series. A final chamber of 100-gallon capacity serves as a chlorine contact chamber before discharge of the treated effluent.

Mechanical systems for camp use are similar in design to those for residential use except that they are usually smaller and required to have a chlorination chamber. Some of these units require AC power, others operate on batteries. They usually do not require continuous power when the camp is not in use for a period of time. Since power requirements vary, check with the manufacturer to be sure that you can meet the power requirements for the unit.



#### COMPOSTING AND INCINERATION

Other types of treatment systems available include compost systems and incineration systems. In compost systems, sewage is mechanically mixed with dry organic material. Elevated temperatures for several days render the product safe. Incineration relies upon burning the waste. This is usually accomplished using either electrical or LP gas energy to heat the waste. Composting toilets can be difficult to properly maintain and operate, while incineration toilets require appreciable amounts of power. Perhaps the biggest obstacle to their use, however, is the current requirement that gray water (water from showers, sinks, etc.) also be treated. Neither incineration nor composting are practical means of treating the volume of water

associated with gray water, but may be a good option for some camps if regulations change.

#### **OPERATION AND MAINTENANCE**

Since both the mechanical and nonmechanical systems discussed previously depend upon the same basic processes, they have similar operation and maintenance requirements.

#### **OPERATIONAL HINTS**

• Minimize the load on the system, particularly oil and grease, as these are difficult for the system to break down. Even cooking oil is detrimental to long-term, trouble free operation. Food scraps should go in the compost pile or the trash, not down the drain.

Avoid the use of garbage disposals. Waste from the garbage disposal will not only fill your treatment system faster and require more frequent pumping, but will also increase scum thickness. Do not dispose of items such as disposable diapers or feminine hygiene products in the system.

- Do not put motor oil, gasoline, diesel fuel, or other petroleum products into the system. Not only will they add to the oil and grease problem, they can also be toxic to helpful bacteria and may present a safety hazard.
- Avoid disposing of strong chemicals such as pesticides, concentrated cleaners, drain cleaners, and large amounts of bleach. These products can kill the bacteria that are working for you. Bacteria should be able to tolerate small amounts or low concentrations of

cleaning and sanitizing products typical of normal household usage.

- Limit both the total volume and disposal rate of water. Too great a flow will reduce retention and treatment time. High rates of flow may even resuspend previously separated material. Try to spread out water-using activities throughout the day rather than doing them all at the same time. Use water-saving appliances, take shorter showers, and don't overfill the tub or flush the toilet unnecessarily. Don't do all the laundry on the same day or let the water run while doing dishes, brushing your teeth, or shaving. Don't empty roof drains into the sewage system and be sure the piping to your treatment system does not leak.
- If you have a leach field, cover it only with grass. Do not drive over the field, or store heavy objects on top of it. Nonporous surfaces such as pavement or concrete will hinder the proper exchange of gasses and slow the biological processes. Plants with large roots such as trees may disturb the flow pattern of the wastewater in the field either by causing stoppages or by providing a direct path through the field, and thus preventing treatment. Heavy objects or traffic can compact the field and reduce its ability to absorb wastewater.

#### MAINTENANCE HINTS

• Be aware of signs that your system is failing. These include sinks or toilets that back up, water or muddy soil around the septic tank or drainfield that can't be explained by rain, and a sewage smell. If you have a mechanical

system, check that power is available and that the motor works. If you have signs of system failure, take prompt corrective action.

 Check to see if solids have accumulated. to such an extent that the system needs pumping. Regular pumping can help prevent system overload and failure. If you have a drainfield, regular pumping helps prevent solids from escaping into the drainfield and clogging soil pores. It is cheaper to pump than to repair a drainfield. How often a tank needs to be pumped depends on the size of the tank and the load. Small tanks and large loading require more frequent pumping. For example, a 1000-gallon tank serving five people will typically need pumping at two-year intervals. The interval for the same tank serving one person is typically 12 years and a 1500-gallon tank serving five people typically needs pumping every 3.3 years. Mechanical systems, because they are typically smaller, require pumping somewhat more frequently, depending on use. Biological and chemical tank additives have not been proven either necessary for proper operation or capable of extending the interval between pumpouts.

#### **REGULATIONS**

Wastewater management at land camps clearly comes under the regulatory authority of the Louisiana Department of Health and Hospitals (DHH), and the U.S. Coast Guard

(USCG) has jurisdiction over wastewater management on vessels. However, there is still confusion in many cases as to what the regulations require. Let's look at some typical scenarios.

#### VESSELS

The federal law governing vessels is perhaps easier to explain: 33CFR104.3 says a vessel "includes every description of water craft or other artificial contrivance used, or capable of being used, as a means of transportation upon the navigable waters of the United States." Vessels, if they have equipment installed to "receive, retain, treat or discharge sewage," must be equipped with a Type I, II, or III Marine Sanitation Device (MSD). The key words in these definitions are "sewage" and "installed". "Sewage," as defined in 33CFR140.3 is "human body wastes and the waste from toilets, and other receptacles intended to receive or retain body waste." Sewage does not include gray water (water from bathtubs, sinks, etc). Sewage is defined as only human body waste.

A covered bucket, unless it is attached to any plumbing, nailed to the floor, or otherwise attached to the vessel, is not "installed". There is nothing in federal marine sanitation law to prevent someone from using a bucket with a lid to receive and retain (briefly) "sewage" and then dispose of the contents properly. Some marinas now provide pumpout facilities for holding tanks, and the contents of buckets may be emptied into a shoreside toilet.

## **MARINA PUMPOUT STATIONS**

Marina Name	City	Waterbody	Lat.	Long.	Phone	Service	Туре
Downtown Marina (\$5.00)	Houma	Bayou Terrebonne	29.599N	90.711W	(985) 873-6428	Full	P/W
Bowtie Marina (\$5.00)	Lake Charles	Contraband Bayou	30.204N	93.240W	(337) 478-0130	Full	Р
Buckeye Landing	Esto	Toledo Bend	31.382N	93.620W	(318) 586-7500	Full	P
Buras Boat Harbor	Buras	Off of BayPomme D'or	29.353N	89.536W	(504) 392-6690	Self	P/W
Cypress Bend Park	Negreet	Toledo Bend	31.420N	93.679W	(318) 256-4118	Full	P/W
Cypress Cove Marina (\$5.00)	Venice	Tiger Pass	29.250N	89.361W	(985) 534-9289	Full	P/W
East Pointe a la Hache Boat Harbor	Pointe a la Hache	Levee Canal	29.567N	89.766W	(985) 333-4177	Self	P/W
Empire Boat Harbor	Empire	Off of Adams Bay	29.377N	89.596W	(504) 538-0551	Self	P/W
Lake End Park (\$3.00)	Morgan City	Lake Palourde	29.718N	91.188W	(985) 380-4623	Full	P
Marina Beau Chene (\$5.00)	Mandeville	Tchefuncte River	30.417N	90.125W	(985) 845-3454	Self	Р
Marina Del Ray (\$10.00)	Madisonville	Tchefuncte River	30.399N	90.153W	(985) 845-4474	Self	Р
Mariner's Village Marina	Mandeville	Lake Pontchartrain	30.366N	90.091W	(985) 626-1517	Full	Р
Moon Lake Resort	Monroe	Ouachita River	32.606N	92.094W	(318) 322-2300	Self	P
Municipal Yacht Harbor	New Orleans	Lake Pontchartrain	30.056N	90.177W	(504) 288-1431	Self	Р
Northshore Marine (\$5.00)	Mandeville	Bayou Castine	30.349N	90.056W	(985) 626-7847	Self	Р
Oak Harbor Marina	Slidell	Lake Pontchartrain	30.216N	89.792W	(985) 641-1044	Self	P
Orleans Marina	New Orleans	Lake Pontchartrain	30.024N	90.199W	(504) 288-2351	Self	Р
Pleasure Point Landing	Toro	Toledo Bend	31.242N	93.581W	(318) 565-4810	Full	P/W
Plum Orchard Park	Doyline	Lake Bistineau	32.413N	93.380W	(318) 987-7275	Full	P/W
South Shore Harbor	New Orleans	Lake Pontchartrain	30.038N	90.016W	(504) 245-3152	Self	P

Sewage discharged by recreational boaters is a substantial contributor to localized degradation of water quality. The discharge of untreated sewage by boaters is prohibited under federal laws in all areas within the navigable waters of the United States. The U.S. Coast Guard is charged with enforcing federal laws regarding sewage aboard vessels. The boarding officer will check for MSD certification as a part of the inspection. Sewage dumping is handled on a case-by-case basis depending on the quantity of sewage released. A hearing officer, who determines the severity of the case, reviews the incident report. If the violation has taken place within three miles of the coast, either state or federal standards will be enforced, depending on which is more stringent. Fines can range from \$250 per incident to \$27,500 per day.

The Louisiana Sanitary Code 13:021(5) says, "Vessels which are permanently moored shall be connected to an approved sewerage system." However, situations in which vessels are *not* permanently moored are not addressed. In addition, DHH's definition of a "vessel" includes some houseboats but not others. A houseboat without a means of propulsion and not registered as a boat with the Louisiana Department of Wildlife and Fisheries or as a documented vessel with the U.S. Coast Guard is not considered a vessel by DHH and therefore falls under its jurisdiction.

Houseboats that are not permanently moored and may be tied up in areas without electricity and other utilities are not addressed in the regulations. While no one wants to unduly contribute to sewage pollution of our waterways, state regulations are unclear as to how the law can be met, in many instances, because of the state's conflicting determination of what constitutes a vessel. This determination is often left to the discretion of the local DHH agent. Further complicating the problem is the state's insistence that gray water be treated as "sewage," a requirement that may cause even correctly installed systems to fail.

#### LAND CAMPS

As mentioned earlier, several types of sewage treatment systems are available, including the traditional septic tank with leach field, mechanical treatment plants, and composting and incineration systems. In addition, the same section of the sanitary code that allows composting and incinerator systems (13:020-1) also permits the use of "...pit toilet (or privy), vault, pail, or chemical toilet... when the State Health Officer determines that it is impractical or undesirable, i.e., such as water under pressure is not available, either to connect to an existing community-type sewerage system...or to construct or install a conventional septic tank system or individual mechanical plant and when in the opinion of the State Health Office, a nonwaterborne system will function without causing a health hazard or nuisance."

Local sanitarians with DHH enforce state regulations. Inspections are usually the result of a complaint. In most cases, the sanitarian will try to work with the camp owner to see that the problem is corrected, but continued non-

compliance could result in a referral to the local district attorney for prosecution. Act 516 of the 2001 Regular Session of the Louisiana Legislature allows the DHH secretary to assess civil fines or other sanctions against violators of the state sanitary code. The fines may not exceed \$100 per day per violation or exceed \$10,000 per violator per calendar year. However, these measures specifically do not apply to "...floating camps, including but not limited to houseboats."

#### SUMMARY

For land-based camps, either in upland or marsh settings, state regulations are clear regarding which type of system is allowed. Correctly sized septic tanks with leach fields would be acceptable in areas that meet percolation criteria and for limited-use ("camp") units in other areas, including swamp and marsh areas. In addition, pit privies, chemical toilets, etc., could be used with DHH approval. Vessels may use a Type I, Type II, or Type III Marine Sanitation Device (MSD) if there is installed equipment to handle sewage.

Houseboats that are permanently moored must connect to an approved sewage system. Owners of houseboats not classified as vessels and not permanently moored may continue to find regulations unclear on this issue, but will probably find that an approved individual mechanical system will meet their needs.

#### RESOURCES

#### **PARISH SANITARIANS**

#### ACADIA PARISH Lynette Falgout

530 West Mill St. P.O.Drawer 1289 Crowley, LA 70527-1289 (337) 788-7507, 7508, 7509 Fax (337) 788-7577

#### ALLEN PARISH Jared Reed

616 Court St. P. O. Drawer 160 Oberlin, LA 70655 (337) 639-4186 Fax (337) 639-2929

#### ASCENSION PARISH Morris Miller

1024 S.E. Ascension Complex Gonzales, LA 70737 (225) 644-4582 or 5916 Fax (225) 644-3635

## ASSUMPTION PARISH J. Leonard Pecanty

158 Hwy. 1008 Napoleonville, LA 70390 (504) 369-6031 Fax (504) 369-2326

#### AVOYELLES PARISH Jerry Smith

657 Government St. Marksville, LA 71351 (318) 253-4528 Fax (318) 253-0862

#### BEAUREGARD PARISH Brandy Champagne

216 Evangeline St. P. O. Box 327 DeRidder, LA 70634-0327 (337) 463-4486 Fax (337) 462-2486

#### BIENVILLE PARISH Stephen Colvin

Corner Chestnut & Beech St. P. O. Box 276 Arcadia, LA 71001 (318) 263 - 2125 Fax (318) 263-2009

#### BOSSIER PARISH Elaine Butler

3022 Old Minden Rd. Bossier City, LA 71112-2427 (318) 741-7314 Fax (318) 741 -7441

#### CADDO PARISH

### Floyd Smith

1033 Creswell St. Shreveport, LA 71101 (318) 676-5265 Fax (318) 676-5033

#### CALCASIEU PARISH Joseph Soileau

707-C. E. Prien Lake Rd. (70601) P.O.Box 3170 Lake Charles, LA 70602 (337) 475-8744 Fax (337) 475-8892

#### CALDWELL PARISH Gregory Horne

P. O. Box 720 Columbia, LA 71418 (318) 649-2393 Fax (318) 649-0969

#### **CAMERON PARISH**

#### Vacant

107 Recreation Center Lane P.O. Box 1430 Cameron, LA 70631 (337) 775-5368 Fax (337) 775-5078

#### CATAHOULA PARISH Dennis Dosher

309 Short St., First Floor P. O. Box 240 Harrisonburg, LA 71340 (318) 744-5261 Fax (318) 744-9344

#### CLAIBORNE PARISH John Warrington

624 West Main St. Homer, LA 71040 (318) 927-6127 Fax (318) 927-6362

#### CONCORDIA PARISH Vacant

905 Mississippi Ave P. O. Box 826 Ferriday, LA 71334 (318) 757-8632 Fax (318) 757-7654

#### DESOTO PARISH Jimmy Brown

120 McEnery St. P. O. Box 312 Mansfield, LA 71052 (318) 872-0472 Fax (318) 872-2220

#### EAST BATON ROUGE PARISH Chuck Methyien

353 North 12<sup>th</sup> St. P.O. Box 3017 Baton Rouge, LA 70821 (225) 342-1734 Fax (225) 342-5821

#### EAST CARROLL PARISH Wavne Driver

407 Second St. Lake Providence, LA 71254 (318) 559-2012 Fax (318) 559-3553

#### EAST FELICIANA PARISH Marshall Cutrer

Marston St. P.O.Box 227 Clinton, LA 70722 (225) 683-8551 Fax (225) 683-3788

#### EVANGELINE PARISH Dwight Brignac

1010 West LaSalle St. P.O. Box 369 Ville Platte, LA 70586 (337) 363-1584 Fax (337) 363-3899

#### FRANKLIN PARISH Don Riser

6614 West Main St. P. O. Box 547 Winnsboro, LA 71295 (318) 435-2143 Fax (318) 435-2136

#### GRANT PARISH Jerry Brevelle

506 Main St P. O. Box 232 Colfax, LA 71417 (318) 627-3133 Fax (318) 627-2981

#### IBERIA PARISH Danny Doyle

121 West Pershing St. New Iberia, LA 70560 (337) 373-0021 Fax (337) 373-0115

#### IBERVILLE PARISH Steve Backstrom

1100 Meriam St. P.O.Box 444 Plaquemine, LA 70765-0444 (225) 687-9021 Fax (225) 687-5275

#### JACKSON PARISH Roger Wilkinson

228 Bond St. P. O. Box 87 Jonesboro, LA 71251-0087 (318) 259-6601 Fax (318) 259-1146

#### JEFFERSON PARISH J. Betty DiMiceli

1855 Ames Blvd.
P.O.Box 458
Marrero, LA 70072
(504) 349-8802 ext 0
Fax (504) 349-8817
111 North Causeway Blvd.
Metairie, LA 70001
(504) 838-5140
Fax (504) 838-5573

#### JEFFERSON DAVIS PARISH Robin Ardoin Basone

403 Baker St. P.O.Box 317 Jennings, LA 70546 (337) 824-2193 Fax (337) 824-0794

#### LAFAYETTE PARISH Susan Trahan

2100 Jefferson St. Building B Lafayette, LA 70501 (337) 262-1274 Fax (337) 262-1320

#### LAFOURCHE PARISH Kenneth Jeffus

2535 Veterans Blvd. Thibodaux, LA 70302 (504) 447-0954 Fax (504) 447-0897

#### LASALLE PARISH Donald McMillin

305 North First St. P. O. Box 17 Jena, LA 71342 (318) 992-4842 Fax (318) 992-6593

#### LINCOLN PARISH Clyde Aycock

405 Ěast Georgia Ave. Ruston, LA 71273-0869 (318) 251-5029 Fax (318) 251-4181

#### LIVINGSTON PARISH Sandra Sibley

20140 Iowa St. P.O.Box 365 Livingston, LA 70754 (225) 686-7017 or 7829 Fax (225) 686-1782

#### MADISON PARISH Eugene Bradley

606 Depot Št. Tallulah, LA 71282 (318) 574-3311 Fax (318) 574-1396

#### MOREHOUSE PARISH Margaret Stokes

650 School Rd. Bastrop, LA 71220 (318) 283-0806 Fax (318) 283-0860

#### NATCHITOCHES PARISH Michael Deason

625 Bienville St. Natchitoches, LA 71457 (318) 357-3132 Fax (318) 357-3136

#### ORLEANS PARISH Jerry Green

1440 Canal St. Suite 1700, P.O.Box 10 New Orleans, LA 70112 (504) 568-7970 Fax (504) 568-7974

#### OUACHITA PARISH Arthur Fisher

1416 Nachitoches St. West Monroe, LA 71292 (318) 362-5539 Fax (318) 362-5541

#### PLAQUEMINES PARISH

#### E. J. Savastano

Health Department 3706 Main St. Belle Chasse, LA 70037 (504) 394-0437 Fax (504) 393-0437

#### POINTE COUPEE PARISH Carl Whittington

Hospital Rd. P.O.Box 460 New Roads, LA 70760 (225) 638-3373 Fax (225) 638-3022

#### RAPIDES PARISH Melissa Bordelon

1500 Lee St. P.O.Box 5918 Alexandria, LA 71301 (318) 487-5282 Fax (318) 487-5557

## RED RIVER PARISH James Smith

2015 Red Oak Rd. P. O. Drawer 628 Coushatta, LA 71019 (318) 932-4087 Fax (318) 932-5415

#### RICHLAND PARISH Louis Ladart

205 South Eugene St. P. O. Box 666 Rayville, LA 71269 (318) 728-4441 Fax (318) 728-6291

#### SABINE PARISH Dorothy Small

1230 West Louisiana Many, LA 71449 (318) 256-4105 Fax (318) 256-4144

#### ST. BERNARD PARISH E. Marlene Tullier

2712 Palmisano Rd. Chalmette, LA 70043 (504) 278-7410 ext. 211 Fax (504) 785-9243

#### ST. CHARLES PARISH Margaret Becnel

107 Maryland Dr. Suite C Luling, LA 70070 (504) 785-1029 Fax (504) 785-9243

#### ST. HELENA PARISH Grafton Cooper

North Second St. P. O. Box 428 Greensburg, LA 70441 (225) 222-6178 Fax (225) 222-6466

#### ST. JAMES PARISH Richard Parre

29170 Health Unit St. Vacherie, LA 70090 (225) 265-2181 Fax (225) 265-7247

#### ST. JOHN PARISH Stanley Howat

473 Central Ave Reserve, LA 70084-0515 (504) 536-3535 Fax (504) 536-2571

#### ST. LANDRY PARISH Vickie Collins

308 West Bloch P. O. Box 552 Opelousas, LA 70571-0352 (337) 948-0220 Fax (337) 948-0324

#### ST. MARTIN PARISH Odis Lounsberry

415 St. Martin St. St. Martinville, LA 70582 (337) 394-3097 Fax (337) 394-1279

#### ST. MARY PARISH Joan Adams

1200 David Dr. Morgan City, LA 70380 (504) 380-2441 Fax (504) 385-7012

#### ST. TAMMANY PARISH William DeBlanc

21454 Koop Dr. Suite 2C Mandeville, LA 70471 (504) 893-6296 or 6297 Fax (504) 893-6268 (504) 646-6448 (Slidell) Fax (504) 646-6474

#### TANGIPAHOA PARISH James Harper

330 West Oak St. P.O.Box 278 Amite, LA 70422 (504) 748-2020 Fax (504) 748-2029 (504) 543-4175 (Hammond) Fax (504) 543-4179

#### TENSAS PARISH

#### **Eugene Bradley**

133 Plank Řd. P. O. Box 77 St. Jospeh, LA 71366 (318) 766-3513 Fax (318) 766-9090

#### TERREBONNE PARISH

#### Ellen Finger

600 Polk St. Houma, LA 70360 (504) 857-3770 Fax (504) 857-3774

#### UNION PARISH David Gardner

1002 Marion Hwy P. O. Box 516 Farmerville, LA 71241 (318) 368-3156 Fax (318) 368-3831

#### VERMILION PARISH Vicky Granger-Toups

401 South St. Charles St. Abbeville, LA 70510 (337) 893-1443 Fax (337) 893-6680

#### VERNON PARISH Robert Westmoreland

406 West Port Arthur Blvd. P. O. Box 14711 Leesville, LA 71496-1471 (337) 238-6410 Fax (337) 238-6447

## WASHINGTON PARISH W. B. Knight

1101 Bene St. P. O. Box 524 Franklinton, LA 70438 (504) 839 - 5646 Fax - (504) 568 - 8969 Bogalusa: (504) 732 - 6615 or 6620

#### WEBSTER PARISH Mike McKinney

1122 Homer Rd. P. O. Box 814 Minden, LA 71055 (318) 371 - 3030 Fax - (318) 371-3073 Springhill: (318) 539-4314 or 9878 Fax (318) 339-2589

#### WEST BATON ROUGE PARISH Carl Wininger

685 Louisiana Ave P.O.Box 227 Port Allen, LA 70767 (225) 342-7528 Fax (225) 383-3552

#### WEST CARROLL PARISH Wayne Driver

Koerner & Beale Streets P. O. Box 306 Oak Grove, LA 71263 (318) 428-9361 Fax (318) 428-7200

#### WEST FELICIANA PARISH Mary Dixon

5154 Burnett Rd. St. Francisville, LA 70775 (225) 635-3644 Fax (225) 635-2167

#### WINN PARISH W. Tom McConnel

301 West Main St. P. O. Box 11 Winnfield, LA 71483 (318) 628-2148 Fax (318) 628-6822

#### AGENTS AND SPECIALISTS, LSU AGRICULTURAL CENTER

## J. David Bankston, Ph.D., Sea Grant Specialist, Engineering

Department of Food Science 123 Food Science Bldg. Louisiana State University Baton Rouge, LA 70803 (225) 578-5207 Email: dbankston@agctr.lsu.edu

#### Brian LeBlanc, Ph.D., Sea Grant Specialist, Watershed Management

St.Tammany, Orleans, Livingston, and Tangipahoa Parishes Louisiana Cooperative Extension Service P.O. Box 2440 Covington, LA 70434-2440 (985) 893-4449 Email: bleblanc@agctr.lsu.edu

## Jerald Horst, Sea Grant Specialist, Fisheries

LSU Ag Center, Jefferson Unit 6640 Riverside Drive, Suite 200 Metairie, LA 70003-7110 (504) 838-1170 Email: jhorst@agctr.lsu.edu

## David Bourgeois, Sea Grant Extension, Fisheries

Lafourche and Terrebonne Parishes
Louisiana Cooperative
Extension Service
101 West 112th St.
Cutoff, LA 70345
(985) 632-6852
(Lafourche Parish)
(985) 873-6495
(Terrebonne Parish)
Email:

dbourgeois@agctr.lsu.edu

## Sandy Corkern, Sea Grant Extension, Fisheries

Lower St. Martin, St. Mary and Iberia Parishes Louisiana Cooperative Extension Service Courthouse Bldg., Room 314 Franklin, LA 70538 (337) 828-4100 ext 300 Email: scorkern@agctr.lsu.edu

## Rusty Gaude, Sea Grant Extension, Fisheries

Plaquemines and St.Bernard Parishes

Louisiana Cooperative Extension Service 479 F. Edward Hebert Blvd., Suite 201 Belle Chasse, LA 70037-3018 (504) 682-0081 ext 2233 Email: agaude@agctr.lsu.edu

## Thomas Hymel, Sea Grant Extension, Watershed Education

Teche, Vermilion Watersheds
Louisiana Cooperative
Extension Service
P.O.Box 466
Jeanerette, LA 70544-0466
(337) 276-5527
Email: thymel@agctr.lsu.edu

#### Kevin Savoie, Sea Grant Extension, Watershed Education Calcasieu, Sabine Watersheds

Louisiana Cooperative
Extension Service
1225 Hodges St.
Lake Charles, LA 70601
(337) 491-2065
Email: ksavoie@agctr.lsu.edu

## Mark Schexnayder, Sea Grant Extension, Fisheries

Orleans, St. John, St. Charles, and Jefferson Parishes LSU AgCenter, Jefferson Unit 6640 Riverside Dr., Suite 200 Metairie, LA 70003-7110 (504) 838-1170 Email: mschexnayder@agctr.lsu.edu

## Mark Shirley, Sea Grant Extension, Fisheries and Aquaculture

Jefferson Davis, Vermilion, Acadia and Lafayette Parishes
Louisiana Cooperative
Extension Service
1105 West Port St.
Abbeville, LA 70510
(337) 898-4335
Email: mshirley@agctr.lsu.edu

#### Margare Frey, Area Agent

Mermentau Watershed LSU Agricultural Center 1065 Highway 749, Suite A Opelousas, LA 70570-9298 (337) 948-0564 Email: mfrey@agctr.lsu.edu

#### Gary Stockton, Area Agent

Ouachita Watershed
LSU Agricultural Center
P. O. Box 539
Calhoun, LA 71225
(318) 644-5865
Email: gstockton@agctr.lsu.edu

## Margaret Stoker, *Area Agent*Upper Red and Upper Sabine

Watershed LSU Agricultural Center 820 W. Main Street Many, LA 71449-3125 (318) 256-6339 mstoker@agctr.lsu.edu