

BACTERIA IMPLEMENTATION GROUP

**On-Site Sewage Facilities and Illicit Discharges Work Group
Meeting Agenda
Thursday, March 23, 2017
1:00 PM to 3:00 PM
H-GAC Conference Room A, Second Floor**

Call to Order/Welcome/Introductions

Review Summary from 12/15/15 Meeting

Presentation: Update on ongoing H-GAC OSSF Implementation

Discussion: Preparing for the BIG 2016 Annual Report

Work group will:

- review the 2016 Annual Report,
- review the timeline for preparing the 2017 report,
- report on implementation activities accomplished in the 2016 calendar year,
- open discussion on expectations for the 2017 Annual Report, and
- discuss focus and priorities for 2017 calendar year.

Discussion: Review I-Plan Strategy 3.0 OSSF and 6.0 Illicit Discharges and Dumping Language

Workgroup will:

- review approved I-Plan wording and anticipate potential I-Plan revisions during 5th year of implementation (2018),
- discuss potential editorial changes,
- agree on any updates, and
- develop recommendations, if necessary, that will be presented at the annual BIG meeting for approval.

Adjourn

Upcoming Meeting Schedule

5/23/2017 BIG Spring Meeting (1:00 PM)
3/28/2017 Animals, Agriculture and Outreach Work Group (1:00 PM-Location offsite)
4/3/2017 Monitoring and Outreach Work Group (1:00 PM)

Instructions to call into BIG meetings:

To call in, dial 713-481-0090 (or 800-240-3895). You will be asked to enter your pass code, followed by the # sign. The pass code is 1084242. If you dial in before H-GAC, you will hear "music on hold". Once H-GAC dials in, the music will cease and the conference call will begin. During the course of the conference, you may hear beeps. A single beep indicates someone has joined the conference call. A double beep indicates someone has left the conference call. Remember--if you do press hold, everyone will hear your hold music.

In compliance with the Americans with Disabilities Act, H-GAC provides for reasonable accommodation for persons attending H-GAC functions. Requests should be received by H-GAC 24 hours prior to the function.



BACTERIA IMPLEMENTATION GROUP

**On-Site Sewage Facilities and Illicit Discharges Workgroup
Draft Meeting Summary
Thursday, December 17, 2015
2:00 PM to 4:00 PM
H-GAC Conference Room A, Second Floor**

Call to Order/Welcome/Introductions

Randy Acreman (SJRA), Richard Chapin (COH), Danielle Cioce (HC), Ian Gray (HC), Frank Green (Montgomery County), Denise Hall (HC), Karen Kottke (AECOM), Scott Nicols (Montgomery County), David Parkhill (SJRA), Bret Raley (SJRA), Vence Salvato (HC), Robert Snoza (HCFCD), Arthur Talley (TCEQ)

Review Summary from 11/10/14 Meeting

The work group reviewed and commented on the notes from the 11/10/14 meeting.

Presentation: Update on ongoing H-GAC OSSF efforts by Will Merrell.

Mr. Merrell from H-GAC provided the update on the region's OSSFs from data housed in H-GAC's Regional OSSF database. The database has increased in size by 21% since 2010. 36% of the OSSFs fall in the BIG project area, which is down from 37% last year. This potentially suggests that homes are transitioning towards sewer systems. The data has improved in accuracy and location precision over since developed in 2010. Database is being used to identify unpermitted or undocumented systems and to target older permitted systems to target those areas for OSSF workshops.

H-GAC has also developed an OSSF Real Estate Inspector training course to cover conventional, low pressure dosing and aerobic systems. There have been two training events given. In addition, H-GAC developed with the TCEQ a supplemental environmental project (SEP) to address failing OSSFs in the Bastrop Bayou watershed. There are currently no SEP funds available for use.

Discussion: Preparing for the BIG 2016 Annual Report

The work group reviewed the 2015 Annual Report and discussed implementation activities accomplished in the 2015 calendar year. It was noted that HC and East Aldine Management District are addressing failing systems. Activities discussed, included:

- The systems are being abandoned in place by filling them in with cement,
- Next real estate course will begin in June 2016
- HC noted the annual OSSF seminar is scheduled for May with registration opening in April 2016
- TCEQ would look into biennial meetings to review OSSF regulations
- Annual authorized agent meetings are anticipated to start up again in 2016
- Suggested addition of a new activity under Illicit Discharges to cover Boater and Marina sources identified by Jarbo Bayou stakeholders
- Include H-GAC camera program to observe dumping activities
- Suggested adding the tracking of honey trucks to future MS4 survey
- Suggested developing a CWI seminar on illegal dumping and the use of cameras.'

The work group reviewed MS 4 Phase II survey and discussed ideas for implementation focus in 2016.

Discussion: Review I-Plan Strategy 3.0 OSSF and 6.0 Illicit Discharges and Dumping Language

The work group reviewed the approved I-Plan wording. The work group suggested that boaters and marinas could be added to the Illicit Discharges and Dumping. The work group would also like to potential address implementation measures for several strategies that are not practical.

Adjourn

Upcoming Meeting Schedule

Stormwater/Land Development/Construction: 9:00 AM on 1/15/2016

Animals and Agriculture: 10:00 AM on 1/20/2016

Monitoring and Research: 2:00 PM on 1/26/2016

BIG Annual Meeting: 1:00 PM on 5/24/2016

Implementation Strategy 6.0: Illicit Discharges and Dumping

Illicit discharges and dumping illegally introduce contaminants into waterways. Sources include illicit discharges and connections to storm sewers, as well as direct discharges and dumping to the water body itself. While a wide variety of sources may introduce contaminants to a water body, the following implementation activities specifically address bacterial contamination, both mobile and stationary.

Many of the TMDLs in the BIG region indicate that illicit discharges and dumping account for significant dry-weather bacteria loadings. Outfalls in Buffalo and Whiteoak bayous TMDL have bacterial *E. coli* loads ranging from 7.43×10^5 to 2.21×10^{11} MPN/day.⁸⁷ In Whiteoak Bayou, these discharges represented the largest source of indicator bacteria loading.⁸⁸ Similarly, in Clear Creek, estimates indicate that between a quarter and a third of all outfalls have illicit dry-weather discharges, and that more than 20 percent of these had *E. coli* concentrations of over 1000 cfu/mL, more than eight times the in-stream standard.⁸⁹

Stakeholders have expressed concern that mobile waste haulers may contribute bacteria directly to area bayous. Waste from septic systems, grease traps, and grit traps is hauled from its originating point. While regulations dictate this waste be properly transported and recorded on a manifest, anecdotal evidence raises suspicion that this waste may not always be properly disposed in a treatment facility.

Given the transitory nature of these discharges, there are no flow-adjusted estimates for their contributions. They have been a widely cited potential source among the project stakeholders. Sampling data, such as unexplained spikes in bacteria levels with no corresponding permitted outfalls or sources nearby, may help identify illicit discharge sources.

Programs to detect and eliminate these illegal discharges are an integral part of TPDES Phase I and II stormwater permits. As such, the activities discussed in this section may also be considered as part of Implementation Strategy 4.0. While all communities and jurisdictions will participate in implementation efforts, the extent to which these activities are applied may vary by individual need and ability.

Implementation Activity 6.1: Detect and Eliminate Illicit Discharges

Jurisdictions shall devise and implement a program, as they deem practicable, to detect and eliminate illicit discharges that assist them in identifying sources for further enforcement action. This implementation activity is similar to the programs required under stormwater permits, but with a

⁸⁷ (TCEQ 2009a)

⁸⁸ (TCEQ 2009a)

⁸⁹ (TCEQ 2008b)

specific focus on direct, bacteria-laden discharges. Existing illicit discharge programs can be modified to focus on bacteria.

Elements of the detection portion of the program may consist of:

- Conducting field surveys of waterways and associated drainage channels,
- Reviewing existing spatial data (geographic information system, engineering drawings, etc.) with on-site visual inspections of water body channels,
- Producing or revising a storm sewer map of all outfalls and the names and locations of all waters of the state that receive discharges from the outfalls,
- Producing or revising, to the level of detail that meets the specific need of the government entity, an initial record of located discharges for comparison against permitted discharges (stormwater outfalls, permitted industrial outfalls, etc.), and
- Reviewing, verifying, and updating the program and data on a regular basis.

Sampling data, where available, may help predict where unidentified illicit point sources may be located (such as unexplained spikes in bacteria levels with no corresponding permitted outfalls or sources nearby). Publicity and outreach efforts regarding these actions, indicating enforcement is imminent, will help promote self-enforcement by current or potential point source dischargers.

Next, the program will seek to eliminate illicit discharges to the extent allowable under state and local law and as resources allow. Entities will pursue elimination through their established methods. If the existing abilities to eliminate these discharges are deemed insufficient, the local entity shall expand their program as detailed in Implementation Activity 6.2, as appropriate. Several illicit discharge detection programs already exist and may be used as guides by stakeholders for developing or altering their approach.⁹⁰

At least annually, local governments shall provide reports of how many illicit discharges have been found and how many have been eliminated. Provision of this information in a copy of an existing report is sufficient.

Implementation Activity 6.2: Improve Regulation and Enforcement of Illicit Discharges

To the extent allowable under state and local laws, an ordinance or other regulatory mechanism must be utilized to prohibit and eliminate illicit discharges. Each jurisdiction must also establish guidelines for enforcement for removing the source of an illicit discharge.

⁹⁰ An example, *A Guidance Manual for Identifying and Eliminating Illicit Connections Municipal Separate Storm Sewer Systems (MS4)*, is available online. (Galveston County Health District 2002)

Stakeholders are concerned current regulations and penalties often fail to act as deterrents, especially given a perceived low level of standardization and enforcement. Jurisdictions shall review and enforce existing regulations, or, as appropriate, develop or improve regulations relating to illicit discharges.

As resources are available, H-GAC shall compile local regulations and make the information available for other communities to emulate as appropriate. H-GAC will also facilitate coordination of standardization, as resources are available, possibly as part of the circuit rider program described in Implementation Strategy 4.0.

Implementation Activity 6.3: Monitor and Control Waste Hauler Activities

Waste haulers routinely transport bacteria-laden materials, including septic, grease trap, and grit trap wastes. When this highly concentrated, untreated waste is discharged into waterways instead of being properly disposed of or treated, it may represent a significant local increase in bacterial loading. Under this implementation activity, bacteria control will occur through the development of monitoring and control programs by individual communities and by a pilot program to monitor waste hauler fleets.

6.3.1: Develop regulations pertaining to waste hauler activities

While many jurisdictions have some degree of regulation regarding waste hauler activities, some programs have had greater success than others. Jurisdictions will, according to their needs and as practicable, create or update a program designed to monitor and control waste hauler activities. This program should integrate inspection and enforcement capacities in order to ensure the ability to provide a strong disincentive for non-compliance. State law⁹¹ allows counties and municipalities to permit and regulate the activities of septic, grease trap, and grit trap waste haulers, up to and including criminal penalties for non-compliance. As resources are available, H-GAC shall compile and make available information about the most effective waste hauler programs.

The City of Pasadena's program, for example, requires all waste haulers have a license or permit, know the nature of their cargo, and maintain a manifest. The program sets forth penalties for violations of these and other requirements, including revocation of permits and monetary fines for each day of non-compliance.⁹² Stakeholders may choose to pursue a regional approach to better track haulers who may operate in numerous jurisdictions. A previous regional project, the Environmental Enforcement Database Application (maintained from 2003-2008 as a pilot project by the H-GAC) shared secure

⁹¹ See Tex. Health & Safety Code Ann. § 368 (2011) (Subchapter A - Transporters of Grease Trap, Sand Trap, and Septic Waste)

⁹² See City of Pasadena, Tex., Code of Ordinances, ch. 37 (Water, Sewers and Sewage Disposal, Article VIII - Liquid Waste Generators and Transporters)

information for local enforcement agencies regarding waste hauler violations. A similar project may help individual entities identify and curtail violators.

6.3.2: Waste Hauler Fleet Tracking Pilot Program

To promote accountability and compliance among waste haulers, the BIG will consider pursuing a grant to develop a pilot program to install global positioning transponders and/or other apparatus or technology on the vehicles of waste haulers who have violated regulations relating to waste transport and disposal. H-GAC, the TCEQ, local jurisdictions, and waste companies would have access to the transponder feed to determine whether individual haulers are making unscheduled stops that may correlate to illicit discharges. Potential funding sources include EPA Section 319(h) nonpoint source program funding (via the TCEQ or the Texas State Soil and Water Conservation Board), State Revolving Fund monies through the Texas Water Development Board, and private foundations.



Approved August 19, 2015

Implementation Plan for Eleven Total Maximum Daily Loads for Bacteria in Waters of the Upper Gulf Coast

Segments: 2421OW, 2422OW, 2423OW,
2424OW, 2432OW, 2433OW, 2434OW,
2435OW, and 2439OW

Assessment Units: 2421OW_01, 2421OW_02, 2422OW_01,
2423OW_01, 2424OW_02, 2432OW_01, 2433OW_02,
2434OW_01, 2435OW_01, 2435OW_02, 2439OW_01

Produced by the Galveston Bay Oyster Waters TMDL Stakeholders

In cooperation with the Galveston Bay Foundation
and the TMDL Team, Water Quality Planning Division, TCEQ

Management Measure 3.0: Boater Waste

Management Measure 3.1: Increase Access to Pump-Out Facilities, Enforce Existing Regulations, Enhance Outreach and Marketing, Designate Galveston Bay as Federal NDZ, Conduct Water Quality Monitoring in Marinas

The goal of this management measure is to reduce the amount of treated and untreated boater sewage discharged into Galveston Bay and its tributaries. While the focus of this I-Plan is on impaired oyster water segments, the Boater Waste Workgroup recommends broadening the efforts of this management measure to include Clear Lake and other tributaries heavily used by boaters. This source of pollution is transient in nature, so the Workgroup believes that targeting a broader audience through cohesive efforts will result in increased success. This includes collaboration among outreach groups (i.e. U.S. Coast Guard Auxiliary, Sail and Power Squadrons, TPWD Boater Education, etc.), environmental groups (H-GAC, GBEP, GBF, etc.), and government/enforcement agencies (U.S. Coast Guard, TPWD Game Wardens, city managers, etc.).

There are currently 32 marinas in the Galveston Bay/Clear Lake area (Table 14). Most marinas are located in the Clear Lake area, which has the third highest concentration of privately owned marinas in the United States (GBEP, 2004). This includes recreational boats and live-aboard boats. At this time, the Workgroup's best estimate is that marinas in the project area have a total capacity of 7,903 boats, including 6,695 wet slips and 1,208 dry boat storage slips (Clean Texas Marina Program, 2013). This number does not include the many canal communities that would add many more boats to that total. Specifically related to boats with the potential of having a marine sanitation device (MSD), 2013 Texas Parks and Wildlife boater registration data captures a total of 8,771 boats greater than 25 feet long in the counties surrounding Galveston Bay. Improper handling of human waste at any of the marinas can result in unauthorized discharges. This can cause elevated bacteria concentrations both within the marina area and in oyster water areas through the transport of bacteria by currents or boating activity. In addition, elevated bacteria concentrations could result from a large number of boaters discharging sewage into the bay itself, which directly affects the oyster waters. The Workgroup found that the extent to which boat sewage contributes to bacteria levels in the UGCOW is difficult to calculate due to the lack of data available regarding this source. In order to better understand this issue, the Workgroup will develop methods to collect data in order to determine boater waste impact on bacteria inputs to the project area.

The following is a summary of regulations and penalties that are applicable to the boater waste issue in Clear Lake and Galveston Bay. The full code references and language can be found in Appendix C.

- It is illegal to discharge untreated waste into any surface water in the state.
- It is illegal to discharge untreated or treated waste into Clear Lake or any other state or federally recognized no discharge zone.

- Treated and untreated sewage may be discharged into coastal waters from a point three nautical miles or further into the Gulf of Mexico.
- Boats equipped with a Type I or II MSD (those with some level of treatment and no holding tank) must secure their y-valve and/or main discharge valve to prevent discharge of sewage while in a no discharge zone.
- Boats equipped with a Type III MSD (those with no treatment and a holding tank) must secure their y-valve and/or main discharge valve unless located three or more nautical miles in the Gulf of Mexico, and dispose of sewage at an approved pump-out facility.
- All MSDs and pump-out facilities must be certified every two years through the TCEQ's Clean Water Certification Program:
(<https://www.tceq.texas.gov/field/cleanwatercert/boatsdisposalrule.html>)
- Violating or failing to comply with these rules is a Class C Parks and Wildlife Code misdemeanor and a separate offense is committed each day a violation continues. Violators may be assessed a fine of up to \$500 per day.
- A game warden or any peace officer certified as a marine safety enforcement officer may enforce these rules.
- If a marine safety officer reasonably suspects that a boat is illegally discharging sewage, they may (if the owner or operator is aboard) board the boat to inspect the MSD and test the system for compliance by flushing a dye tablet.

Increase Access to Pump-Out Facilities

The Workgroup and local boating community widely agree that Galveston Bay and Clear Lake need more pump-out facilities. Local government entities will be encouraged to pass an ordinance requiring marinas to provide a pump-out if certain conditions are met. Those conditions will be determined as more research is done and information becomes available. One example would be to require a pump-out station for every 200 boats in a marina that are 26 feet or larger (U.S. EPA, 1985). Another example is an ordinance that the City of Seabrook passed in 2010. Section 80-269 states, "every marina with more than ten slips, or with more than 200 linear feet of mooring at bulkheads or piers, shall provide an approved dump station for sanitary sewage. Approved dump stations include mobile facilities." A mobile facility refers to a piece of on-site equipment (i.e. limited capacity pump-out cart) at the marina, not to mobile pump-out companies. Seabrook has expressed their support of improving water quality and their intent to collaborate with GBF and the Workgroup to ensure that this ordinance is being followed. Moving into the future, the city anticipates researching and working toward formulating ordinances that will help protect water quality, such as requiring that new marina developments install stationary pump-out facilities (not allowing mobile facilities to be the only pump-out on-site), and requiring visible signage throughout marinas to educate boaters of discharge regulations, enforcement contact information, and available pump-out facilities. The Workgroup will collaborate with the City of Seabrook by providing supporting information as they work to enforce their existing

ordinance, as well as make recommendations as they develop new ordinances. The Workgroup will use the City of Seabrook as a positive local example of how municipalities can assist in reducing bacteria in Galveston Bay and encourage other local governments to follow suit.

To date, there are thirteen public and three private pump-out facilities, only six of which are located in Galveston Bay. Additionally, there are three mobile pump-out companies (Figure 10). With the potential of having over 8,000 vessels traveling throughout the Clear Lake/Galveston Bay area, the Workgroup and local boating community overwhelmingly believe that more pump-out facilities are needed. The asterisks in the "Pump-Out" column of Table 14 indicate the marinas and other waterfront locations at which the Workgroup recommends installing pump-out stations based on the number and size of boats in the marina, and/or its navigability. If accomplished, this would result in ten new pump-out stations across the Galveston Bay system. The Boater Waste Workgroup will open discussions with the local jurisdictions and marinas to solicit their support to add pump-out facilities where they are most needed. An effort will be made to seek funding to increase the number of pump-out facilities in the area. For example, the Workgroup will assist these entities in applying for Clean Vessel Act (CVA) grants that are available through TPWD, which can fund up to 75% of installation of the public pump-out facilities. This grant funding comes directly from taxes on fishing and boating supplies to the Sport Fish Restoration and Boating Trust Fund. The taxes go back into improving the environments that support these recreational activities. Additionally, the Workgroup recommends that marinas build the cost of installing and maintaining pump-out facilities into their slip fees, which many already do in order to provide this "free" service to their tenants.

Enforce Existing Regulations

The Workgroup believes that enforcement of existing laws and regulations needs to become a local priority, particularly in Clear Lake, where a federal NDZ designation already exists (Figure 10). An increase in enforcement will help decrease the amount of sewage discharged from boats. One recommended effort is to capture data from the U.S. Coast Guard, as well as Galveston and Harris County TPWD Game Wardens regarding their current inspection activities and coordinate with them for increased inspection efforts in marinas. Additionally, the Workgroup recommends facilitating training for Galveston and Harris County TPWD Game Wardens on marine sanitation devices and how to easily incorporate this knowledge into their existing vessel inspection checklist based on successful enforcement efforts by Game Wardens on Lake Texoma. Finally, improved communication between enforcement agencies and those engaged in education and outreach is needed in order to better understand each other's roles and how their uniquely focused efforts contribute to reducing sewage discharges and improving water quality. GBF is leading this communication effort through a Clean Vessel Committee, which will meet on at least a semi-annual basis.

One issue regarding enforcement that has been identified is that many of these agencies receive very few, if any reported complaints of boat sewage dumping,

whereas GBF, marina management, mobile pump-out companies and those on the water see evidence and reports of non-compliant MSD equipment and dumping on a regular basis. The lack of reporting is likely due to citizens not being sure of where to report or how to submit useful reports, resulting in limited success in the follow-up response to their reports. GBF launched a beta Web tool in August 2012 called Galveston Bay Action Network (www.galvbay.org/gban) in order to help facilitate reporting and, based on lessons learned, is in the process of creating an improved application that will directly link reports via Web, Android, or iPhone applications to the appropriate authorities. The Workgroup believes that simplifying the reporting process through this app and educating citizens on how to report through available materials such as TCEQ's publication "Do You Want to Make an Environmental Complaint?" (GI-278), will lead to increased reporting and successful enforcement.

Enhance Outreach and Marketing

For each of these tasks, a strong education and outreach program is necessary for success. GBF has led a region-wide Boater Waste Education Campaign (Pump Don't Dump) since 2008, which began as a social marketing campaign and now consists of many on-the-ground components including hands-on volunteer and outreach programs for boaters of all ages. GBF will continue to collaborate with the Boater Waste and Policy and Outreach Workgroups on this outreach campaign and increase collaboration with GBEP's Back the Bay campaign on social marketing efforts. The Workgroup will also increase their communication with commercial boating operations to determine their concerns and needs in preparation for the NDZ. Partnerships will continue to be formed with marinas, in the project area as well as the U.S. Coast Guard Auxiliary, Houston Sail and Power Squadron, Galveston Bay Sail and Power Squadron, TPWD Boater Education, and Houston Safe Boating Council in order to build relationships and implement the Pump Don't Dump campaign through enhanced education efforts. More widespread and collaborative participation is needed in order to educate boaters about where public pump-out stations are located, to increase awareness of applicable marine sanitation codes and fines, and to capture more extensive data of outreach activities carried out by campaign partners. Finally, GBF staff will attend city council meetings, Rotary Club meetings, as well as other government entities, environmental organizations, and civic associations to present information about this management measure and will develop new educational materials for the campaign when necessary.

Designate Galveston Bay as Federal No Discharge Zone (NDZ)

The Boater Waste Workgroup will explore the possibility of submitting an application to the U.S. EPA to designate Galveston Bay as a federal NDZ (both treated and untreated sewage) (Figure 10). Under Section 312 of the CWA, U.S. EPA or States may establish no discharge zones in which the discharge of both treated and untreated sewage from all vessels into specified waters is prohibited. It is still legal to discharge treated boat sewage into Galveston Bay so it is not yet a NDZ, by definition.

The Workgroup believes that the most appropriate NDZ application for Galveston Bay is for waters that have environmental importance (CWA Section 312 (f)(4)(A)). Historically,

Galveston Bay accounted for about 90 percent of oysters produced in the state of Texas. This production has decreased over the years due to increasing salinities caused by droughts, making the oysters more prone to predation and parasites. Additionally, bacteria impairments in several segments and negative impacts from Hurricane Ike in 2008 have put pressure on Galveston Bay oyster fisheries. Currently, Galveston Bay supplies only about one-third of Texas' oysters, but they are still a key economic asset for the region (TPWD, 2013). In addition, oysters serve an important ecological role as filter feeders in the estuary influencing conditions such as water clarity and phytoplankton abundance. Oysters create reef habitats utilized by many other species and serve as an important indicator of the overall health of a bay ecosystem. However, only a few federal NDZ designations have been made under CWA Section 312 (f)(4)(A), so the Workgroup will also consider applying under Section 312 (f)(3), which is based on the water body having an adequate number of pump-out facilities.

Conduct Water Quality Monitoring in Marinas

The Boater Waste Workgroup recommends that baseline and long-term trend data be collected, and that focused sampling be carried out in marinas in order to determine the effectiveness of implementation efforts over time. The Environmental Institute of Houston (EIH) carried out a baseline study for TCEQ in 1993 in several marinas throughout Clear Lake and Galveston Bay, but no other data was collected in marinas until recently when GBF launched their volunteer Water Monitoring Team (a partner with Texas Stream Team) in 2012 and a volunteer sampling program for Enterococci in 2013. GBF will continue to run these programs in order to collect monthly ambient data, as well as conduct focused bacteria studies in several marinas. These studies will look at a variety of bacteria sources and variables (i.e. stormwater, birds, boat activity, marina design, etc.) in order to better understand the complex water quality challenges that can exist in marinas. Additionally, the Workgroup will seek funding in collaboration with EIH in order to repeat their 1993 study, if further data are needed.

Responsible Parties and Funding

The following parties are responsible for carrying out various components of this management measure:

- Boater Waste Workgroup
- Clean Texas Marina Program
- Clean Vessel Committee
- Clear Lake Marina Association
- Environmental Institute of Houston
- Galveston Bay Foundation
- Galveston Bay Sail and Power Squadron
- Galveston County Health District
- Harris County Pollution Control Services
- Houston Safe Boating Council
- Houston Sail and Power Squadron
- Individual boaters in the project area

- Individual marinas in the Clear Lake/Galveston Bay area
- Marina Association of Texas
- Marine Safety Officers
- Maritime Sanitation
- Maximum Marine Services
- Policy and Outreach Workgroup
- Redfish Island Marine
- Texas Commission on Environmental Quality
- Texas Department of State Health Services
- Texas Parks and Wildlife (Boater Education and Enforcement Division)
- U.S. Coast Guard Auxiliary
- U.S. Coast Guard Marine Safety Units

The Boater Waste Workgroup will seek financial assistance to support the proposed outreach activities and to assist with installing additional pump-out stations throughout the project area. Potential funding sources include the Texas General Land Office Coastal Management Program, Galveston Bay Estuary Program, Clean Vessel Act pump-out funds, Clean Water Act Section 319 Nonpoint Source Grant Program, Five Star and Urban Waters Restoration Grant Program, U.S. EPA - Gulf of Mexico Program, Supplemental Environmental Project funds, and foundation grants or corporate sponsorships.

Implementation Plan for Eleven TMDLs for Bacteria in the Waters of the Upper Gulf Coast

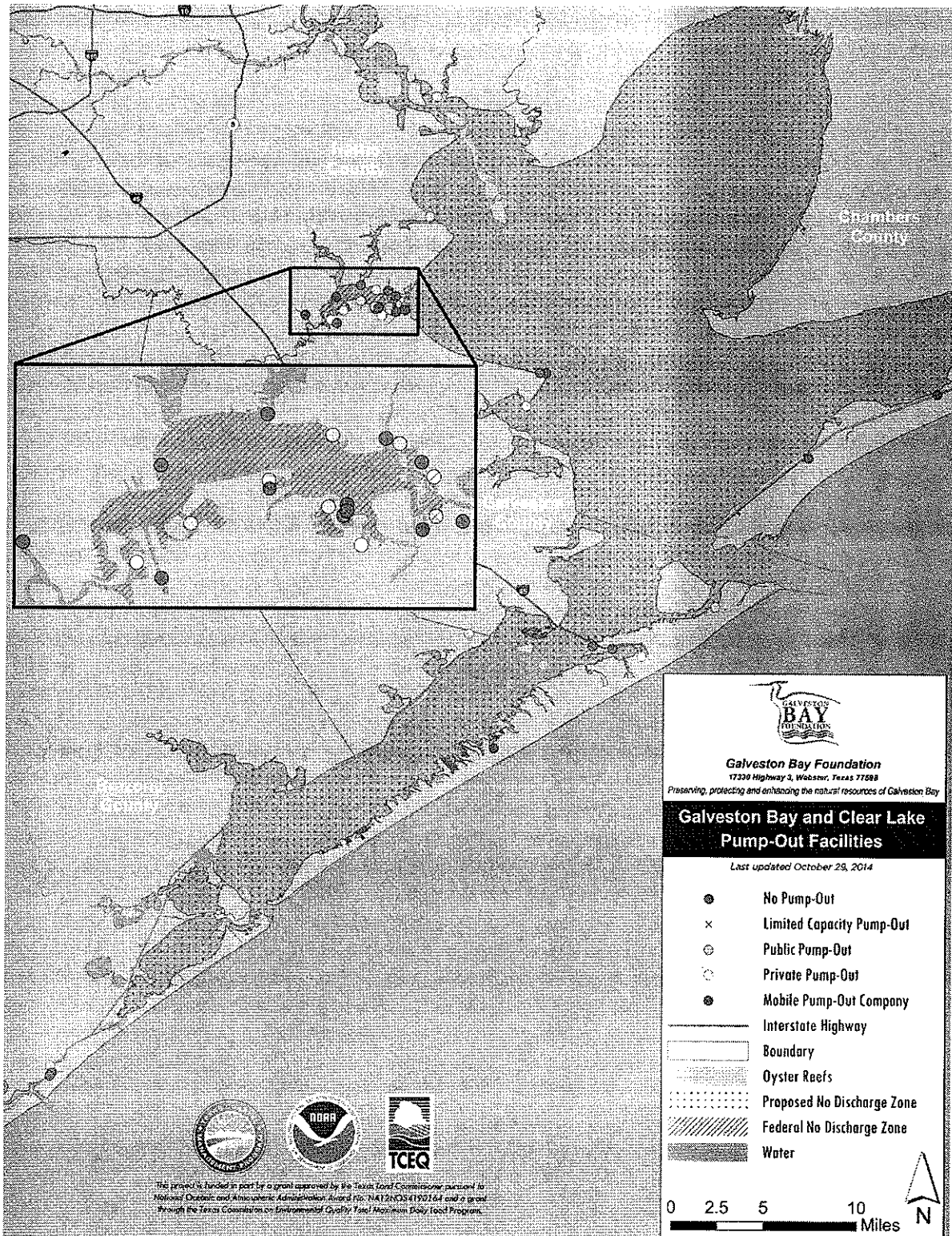


Figure 10. Galveston Bay and Clear Lake boat pump-out facilities (13 public, 3 private, 3 mobile)

Table 14. Marinas and Other Waterfront Locations in the Galveston Bay Area (Clean Texas Marina Program, 2013)

Marina Name and Location						Slips and Ramps			
						Wet Slips	Dry Slips	Ramp	Pump Out
Clear Lake									
Bal Harbor Marina	123 Lakeside Lane	Nassau Bay	TX	77058	(281) 333-5168	133	0	No	No*
Blue Dolphin Yachting Center, Inc.	P.O. Box 123	Seabrook	TX	77586	(281) 474-4450	237	0	No	No*
Clear Lake Marine Center, Inc.	P.O. Box 716	Seabrook	TX	77586	(281) 326-4426	161	0	No	No*
Constellation Point and Marina	451 Constellation	League City	TX	77573	(281) 334-2527	48	0	No	No
Endeavour Marina	3101 NASA Parkway	Seabrook	TX	77586	(832) 864-4000	0	380	No	Yes
Kemah Boardwalk Marina	555 Bradford Street	Kemah	TX	77565	(281) 334-2284	424	0	No	No*
Lakeside Yachting Center, Inc.	2511- B Nasa Rd. 1, Ste. 101	Seabrook	TX	77586	(281) 326-5547	75	0	No	No
Lakewood Yacht Club	2425 Nasa Parkway	Seabrook	TX	77586	(281) 474-2511	300	0	Yes	Yes
Legend Point (private)	1300 Marina Bay Drive	Clear Lake Shores	TX	77565	(281) 334-3811	254	0	No	Yes
Marina Bay Harbor Yacht Club	P.O. Box 478	Kemah	TX	77565	(281) 535-2222	0	280	No	No
Marina Del Sol	1203 Twin Oaks Boulevard	Kemah	TX	77565	(281) 334-3909	265	195	No	Yes
Nassau Bay Yacht Club	1120 Nasa Pkwy, Ste. 109	Nassau Bay	TX	77058	(281) 333-2570	40	55	Yes	No
Portofino Harbour	One Portofino Plaza	Clear Lake Shores	TX	77565	(281) 334-6007	212	0	No	Yes
Seabrook Marina Inc.(private)	1900 Shipyard Drive	Seabrook	TX	77586	(281) 474-2586	500	135	No	Yes
South Shore Harbour	2551 South Shore Blvd., Ste B	League City	TX	77573	(281) 334-0515	858	0	No	Yes
Waterford Harbor Marina	800 Mariners Drive	Kemah	TX	77565	(281) 334-4400	640	0	No	Yes
Watergate Yachting Center	1500 Marina Bay Drive	Clear Lake Shores	TX	77565	(281) 334-1511	1000	0	No	No*
Wharf at Clear Lake (WSMA) (private)	P.O. Box 1208	League City	TX	77574	(281) 334-5976	205	0	Yes	Yes

*Workgroup recommends pump-out facility be installed based on the number and size of boats in the marina, and/or its convenient access

Marina Name and Location						Slips and Ramps			
Galveston Bay						Wet Slips	Dry Slips	Ramp	Pump Out
Bayland Marina	2651 S. Highway 146	Baytown	TX	77520	(281) 422-8900	150	0	Yes	Yes
Eagle Point Fishing Camp, Inc.	Route 1 Box 1718	San Leon	TX	77539	(281) 339-1131	37	46	Yes	No
Galveston Yacht Basin	715 North Holiday Dr.	Galveston	TX	77550	(409) 762-9689	500	300	Yes	Yes
Harborwalk Marina	P.O. Box 2328	League City	TX	77574	(409) 935-3737	156	0	Yes	Yes
Houston Yacht Club	3260 Miramar Drive	Shoreacres	TX	77571	(281) 471-1255	187	100	Yes	Yes
Payco, Inc.	501 Blume Drive	Galveston	TX	77554	(409) 744-7428	150	0	No	No*
Pelican Rest Marina	7819 Broadway	Galveston	TX	77554	(409) 744-2618	33	0	No	No*
Pirates Beach Bait & Tackle	14302 Steward Road	Galveston	TX	77554	(409) 737-3635	25	0	Yes	No
Ray's Marina	6310 Herds Lane	Galveston	TX	77551	(409) 744-2111	26	0	No	Yes
Gulf Intracoastal Waterway						Wet Slips	Dry Slips	Ramp	Pump Out
Bolivar Yacht Basin	1283 West Boyt Road	Port Bolivar	TX	77650	(409) 684-7777	35	0	Yes	No
Bridge Harbor Yacht Club	411 Sailfish Avenue	Freeport	TX	77541	(979) 233-2101	300	0	No	Yes
Gulf Coast Marina	135 Shark Lane	Surfside Beach	TX	77541	(979) 239-1502	0	100	No	No
Stingaree Marina	1297 N. Stingaree Drive	Crystal Beach	TX	77650	(409) 684-9530	8	0	Yes	No
Surfside Marina	827 Gulf Road	Surfside Beach	TX	77541	(979) 230-9400	34	245	No	No*

*Workgroup recommends pump-out facility be installed based on the number and size of boats in the marina, and/or its convenient access

Other Waterfront Locations						Slips and Ramps			
Clear Lake						Wet Slips	Dry Slips	Ramp	Pump Out
Blue Marlin Fuel Dock	1900 Shipyard Drive	Seabrook	TX	77586	(281) 291-7497	6	0	No	No*
Star Fleet Yachts	280 Grove Road	Kemah	TX	77565	(281) 334-4692	0	0	No	No*
Galveston Bay						Wet Slips	Dry Slips	Ramp	Pump Out
Topwater Grill	815 Avenue O	San Leon	TX	77539	(281) 339-1232	20	0	Yes	Yes

*Workgroup recommends pump-out facility be installed based on the number and size of boats in the marina, and/or its convenient access

Measurable Milestones

In Year One, the Workgroup will continue to survey and collect data in order to determine boater waste impact on bacteria inputs to the project area. This information will be compiled and submitted in a request to the TCEQ to apply to the U.S. EPA to make Galveston Bay a federal NDZ. Discussions will continue with local municipalities, enforcement agencies, marinas, and boaters in order to get support for the effort to make Galveston Bay a federal NDZ, to encourage installing more pump-out stations, and to pass an ordinance requiring pump-out stations in at least one municipality. The Boater Waste Workgroup will continue collaborating with the Clean Vessel Committee, and seek funding for additional pump-out stations, additional training workshops for marine officers, and additional educational and outreach materials. Partners will update the larger stakeholder group at an annual stakeholder meeting.

In Years Two, Three, and Four, the Workgroup will continue to garner support for the federal NDZ designation and get it approved, gain support to pass another ordinance in a different local government entity, and add one new pump-out at another key location. The Boater Waste Workgroup will continue collaborating with the Clean Vessel Committee, and seek funding for additional pump-out stations, additional training workshops for marine officers, and additional educational and outreach materials. Partners will update the larger stakeholder group at an annual stakeholder meeting.

In Year Five, partners will evaluate the effectiveness of implementing this management measure and make appropriate adjustments.

Table 13 provides additional details for Management Measure 3.1. Appendix A provides the schedule of implementation.

Table 15. Boater Waste Management Measure 3.1

(1) Management Measure	(2) Potential Load Reduction	(3) Technical and Financial Assistance Needed	(4) Education Component	(5) Schedule of Implementation	(6) Interim, Measurable Milestones	(7) Progress Indicators	(8) Monitoring Component	(9) Responsible Organization
Nonpoint Sources from Boater Waste								
<p>Management Measure 3.1: Increase Access to Pump-Out Facilities, Enforce Existing Regulations, Enhance Outreach and Marketing, Designate Galveston Bay as Federal NDZ, and Conduct Water Quality Monitoring in Marinas</p>	<p>This TMDL calls for a concentration-based target of 0 CFU per 100 mL</p>	<p>Technical: Assistance from the Coast Guard Auxiliary/Game Wardens to train marine officers</p> <p>Work with the TCEQ to develop an application for federal NDZ designation</p> <p>Financial : Grant funding, loans, and existing local funding as available</p>	<p>Education and outreach to marinas to install pump-outs, adopt BMPs and participate in volunteer water quality monitoring</p> <p>Education and outreach to jurisdictions to require pump-out stations at marinas with certain conditions</p> <p>Workshop to train marine officers</p>	<p>Year 1: Survey/collect data to determine impacts</p> <p>Continue promoting NDZ and adding pump-out stations through education and outreach</p> <p>Discussions with marina owners and various jurisdictions</p> <p>Marine officers increase enforcement efforts</p> <p>Begin federal NDZ application process</p> <p>Years 2, 3 and 4: Final approval of application for federal NDZ</p> <p>Pass one ordinance and add one pump-out per year</p> <p>Marine officers increase enforcement efforts</p> <p>Year 5: Evaluate the effectiveness of the MM</p>	<p>Plan of action created to facilitate establishment of federal NDZ</p> <p>Discussions being held with local governments to establish new ordinance</p> <p>Discussions being held with marinas to install pump-outs</p> <p>Volunteer monitoring carried out in marinas</p> <p>Continued tracking and improvement of outreach campaign</p>	<p>Reduction in fecal coliform concentrations</p> <p>Establishment of federal NDZ</p> <p>Number of new pump-out stations and ordinances</p> <p>Increased enforcement efforts</p> <p>Quantity of educational materials distributed</p> <p>Volunteer monitoring sampling plan or QAPP</p> <p>Number of marinas monitored for water quality</p>	<p>Routine water quality monitoring by TDSHS and TCEQ</p> <p>Volunteer monitoring in marinas via GBF Water Monitoring Team (through Texas Stream Team program)</p>	<p>Recommend that TCEQ assist in applying for federal NDZ</p> <p>Recommend that local jurisdictions develop new ordinances and marinas increase pump-out stations</p> <p>GBF will meet with stakeholders and public officials to get support for federal NDZ</p> <p>Workgroup will continue outreach campaign</p> <p>Recommend that TPWD provides increased training to local Game Wardens and that all enforcement agencies increase enforcement efforts</p>