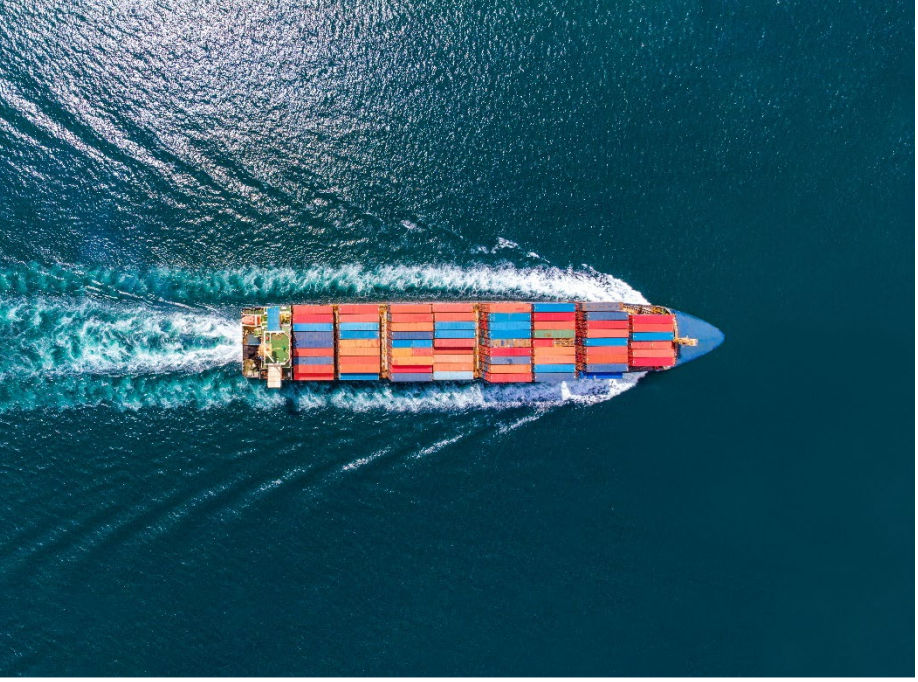

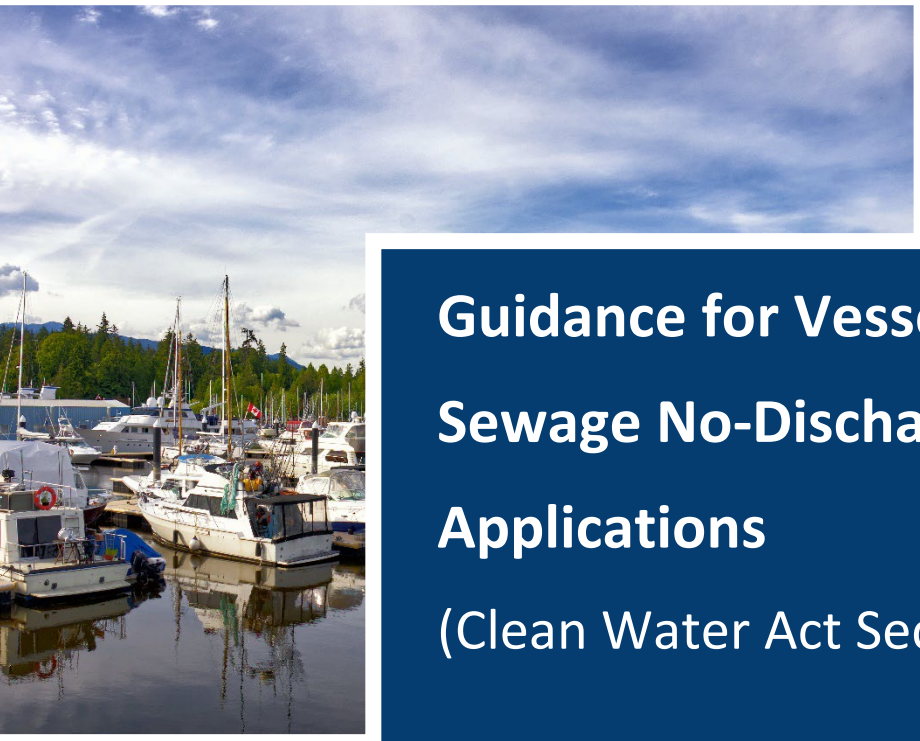

Guidance for Vessel Sewage No-Discharge Zone Applications

(Clean Water Act Section 312(f))

EPA 842-F-23-001 May 2023

EPA United States Environmental Protection Agency

PREFACE

The purpose of the "Guidance for Vessel Sewage No-Discharge Zone Applications (Clean Water Act Section 312(f))" is to assist states in developing applications for vessel sewage no-discharge zones under Clean Water Act Section 312(f). This guidance document does not provide information on the no-discharge zone programs under CWA Section 312(n) – the Uniform National Discharge Standards (UNDS) – or CWA Section 312(p) – the Vessel Incidental Discharge Act (VIDA). These two programs are for non-sewage discharges incidental to the normal operation of vessels of the Armed Forces, and non-recreational, non-Armed Forces vessels, respectively.

This guidance supersedes the 1994 guidance, titled "Protecting Coastal Waters from Vessel and Marina Discharges: A Guide for State and Local Officials; Volume I. Establishing No Discharge Areas under §312 of the Clean Water Act.

The information collections associated with the vessel sewage no-discharge zone program have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. Preparation and submission of a CWA Section 312(f) no-discharge zone application by a state (and therefore the accompanying information collection requirements) is entirely voluntary. This guidance does not modify the required regulatory components of a state's application (as identified in 40 CFR Part 140). The optional information outlined in the guidance is not required for a complete application; however, it is included because the information reflects existing customs and practices and can help EPA reach a more informed decision. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control number for this collection is 2040-0187.

The contents of this document do not have the force and effect of law and are not meant to bind the public or states in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

ACKNOWLEDGEMENTS

This guidance document was prepared by EPA's Office of Water, Office of Wetlands, Oceans, and Watersheds, with the support of the Office of General Counsel and EPA Regional No-Discharge Zone Coordinators.

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Purpose

The purpose of this guidance is to assist states with developing applications for vessel sewage no-discharge zones under CWA Section 312(f) and to provide context on how EPA evaluates a submitted application. This document provides background information on the environmental impacts of vessel sewage and the regulations in place to protect U.S. waters from these discharges. This document also explains and clarifies the information that EPA considers in review of an application to meet the various regulatory requirements, as well as provides examples of the information that the state may choose to include to assist EPA in making an informed decision. The appendices contain sample applications, information on related programs, a walkthrough of the tool that supports EPA's analysis of costs for CWA Section 312(f)(3) applications, and strategies states may consider to encourage compliance with a no-discharge zone designation.

This guidance document pertains only to vessel sewage no-discharge zones and does not discuss other categories of vessel discharge or no-discharge zones for other discharge types.

Section 1.0: Introduction and Background Information

The U.S. Environmental Protection Agency (EPA) and U.S. Coast Guard (USCG) regulate vessel sewage under Section 312 of the Clean Water Act (CWA) primarily through the establishment of nationally uniform federal regulations governing the treatment and discharge of sewage from vessels into U.S. waters (see 40 CFR Part 140 and 33 CFR Part 159, respectively). CWA Section 312 defines "sewage" as "human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes except that, with respect to commercial vessels on the Great Lakes, such term shall include graywater" (see 33 U.S.C. 1322(a)(6)). The CWA also allows a state to prohibit the discharge of vessel sewage – even if treated to meet federal regulations – to state waters by establishing a vessel sewage "no-discharge zone" for all or some of the waters of the state. By submitting an application to EPA, a state may pursue one of three different types of no-discharge zone designations under the CWA, as described later in this section.

1.1 Environmental and Human Health Impacts of Vessel Sewage

Raw or inadequately treated sewage entering U.S. waters from vessels poses a threat to human health and the environment. Sewage degrades a variety of water quality parameters, such as nutrient levels and dissolved oxygen. These negative impacts affect the health of aquatic ecosystems by impacting seagrass, fish, and benthic communities. The extent of adverse impacts may depend on many factors, including the number, size, and density of vessels, the extent of dilution, and the frequency and duration of mixing events. Additionally, vessels that discharge sewage to surface waters near sensitive habitats (e.g., coral reefs) and shellfish beds increase the threat, and in some cases, the likelihood of negative impacts to human health and the environment.

1.1.1 Impacts to Water Quality

Vessel sewage discharges can negatively affect the visual appearance of receiving waters (e.g., decreased clarity) and alter the water's chemical and biological properties. For example, sewage may contain high concentrations of nutrients. Increased nutrient levels accelerate the growth and proliferation of algae and other aquatic plants through a process known as eutrophication. After the algae and other aquatic plants die, they are rapidly decomposed by aerobic bacteria in the water. This process consumes the available dissolved oxygen essential to the survival of fish and aquatic organisms and produces carbon dioxide that may contribute to localized coastal acidification. Low levels of dissolved oxygen affect aquatic animals, causing changes in behavior, reproductive indicators, and mortality rate. Nutrient pollution and eutrophication are also known to contribute to the occurrence of harmful algal blooms.

Sewage can also increase biochemical oxygen demand (BOD) by directly introducing organic material to a waterbody. BOD measures the amount of oxygen used to decompose all organic matter in the water and the oxygen that would be extracted by the chemical reactions of inorganic matter. High BOD levels, which may indicate fecal contamination, mean that oxygen will be quickly depleted from the system. Low dissolved oxygen levels in the water column can lead to serious impacts on aquatic ecosystems, causing events such as fish kills.

Sewage also affects the turbidity of water through the addition of solid waste. Turbidity is a measure of the cloudiness or opaqueness of water and depends on the number of particles suspended in the water column. High turbidity can block sunlight from reaching aquatic plants and corals, increase surface temperatures, facilitate the transport of pollutants, and impair fish feeding, growth, and gill function.

The chemicals used to treat sewage onboard vessels also may cause adverse environmental impacts upon release. In the U.S., treatment systems frequently use chlorine to disinfect the effluent. To ensure adequate treatment onboard, chlorine may be used at such levels that residual chlorine, which is harmful to aquatic life, is released with the treated discharge. Certain holding tank additives, such as those used to control odor, may also contain potentially harmful chemicals (e.g., quaternary ammonia and formaldehyde). In addition, when these tanks are pumped out and their contents are transferred to onshore wastewater treatment facilities, the chemicals can be disruptive to the onshore treatment facilities.

1.1.2 Impacts to Flora and Fauna

Scientists have observed negative impacts on seagrass, coral, fish, and benthic communities attributable to water quality degradation from sewage contamination. For example, seagrass meadows can be shaded by fast-growing macroalgae and other primary producers that proliferate in response to sudden nutrient increases, decreasing their ability to photosynthesize. Increased nutrient levels have also been linked to increased mortality and potentially increased disease severity in corals. Fish species are also adversely impacted by sewage. Changes in fish abundance, assemblage structure, species richness, and health indicators have all been observed. The response of benthic communities to sewage depends on their proximity to the source of sewage. In the immediate vicinity of the source, organic inputs can create zones with depleted dissolved oxygen levels where fewer species can live. In areas further from the source, the benthic community may become dominated by species tolerant to pollution that benefit from the organic enrichment. Sustained sewage inputs – a human-caused stressor – can therefore lead to shifts in species composition within the benthic community. These shifts can depress species diversity and specific species' numbers, as well as affect ecosystem function depending on the nature and magnitude of the shift.

1.1.3 Impacts of Direct and Indirect Exposure

The negative impacts of sewage contamination may extend beyond aquatic species to humans because untreated and/or inadequately treated sewage contains bacteria and viruses that can pose a risk to human health. Direct and indirect exposure to waters contaminated by human sewage, such as swallowing water while swimming or boating, can lead to illnesses such as gastroenteritis (stomach flu) or more serious diseases. Human health may also be at risk from consuming contaminated shellfish. Shellfish are filter-feeders that can accumulate harmful substances, such as viruses, into their tissues from the surrounding water. Consumption of contaminated shellfish can cause illness, particularly if the shellfish are eaten raw. Because of the risks to human health, sewage contamination of shellfish beds or commercial shellfish farming operations can lead to closures and restrictions on shellfish harvesting, causing adverse economic impacts to commercial, recreational, and tribal shellfish harvesters.

1.2 Statutory Authority for Vessel Sewage Regulation

To minimize the environmental and human health impacts that may result from discharges of vessel sewage, the quality of treated sewage discharges is regulated uniformly on a national basis under CWA Section 312. While CWA Section 312 vessel sewage regulations are the focus of this guidance, several other federal laws and provisions also address the management of vessel sewage. A summary of these and their relation to vessel sewage is provided in Appendix B. CWA Section 312(a) through (m) establishes the statutory framework through which EPA and the USCG promulgate regulations to address the human health and environmental concerns associated with vessel sewage discharges into U.S. waters. EPA's role is to develop federal standards of performance for marine sanitation devices (MSDs). As defined in the CWA, an MSD "includes any equipment for installation on board a vessel which is designed to receive, retain, treat, or discharge sewage, and any process to treat such sewage." The CWA also instructs the USCG to develop regulations governing the design, construction, installation, and operation of MSDs and authorizes the USCG (or a state) to enforce EPA's regulations.

To establish and maintain nationally uniform requirements, states are preempted from adopting or enforcing MSD standards that are more stringent than the federal standards except with respect to sewage from a houseboat. Under CWA Section 312(f), however, a state or EPA may establish a complete prohibition on vessel sewage discharges, even treated discharges, by designation of a no-discharge zone. There are three different types of no-discharge zones subject to distinct statutory determinations and regulatory requirements. The following sections describe the regulations for both MSDs (Section 1.2.1) and no-discharge zones (Section 1.2.2). Section 1.2.4 briefly explains the CWA Section 312 regulations applicable to other non-sewage discharges from vessels.

1.2.1 Marine Sanitation Devices

All vessels with installed toilets operating in U.S. waters must have an operational, USCG-certified MSD onboard (see 33 CFR 159.7(a)). The MSD is connected to the vessel's marine head, or toilet, to ensure that sewage is not discharged without treatment into or upon the navigable waters. Depending on the type of MSD installed, vessel operators can use the MSD to retain sewage onboard in a holding tank or treat the sewage to meet EPA's standards prior to discharging to surrounding waters.

Three types of MSDs (Types I, II, and III) are suitable for use onboard vessels to comply with EPA and USCG requirements (see 40 CFR Part 140 and 33 CFR Part 159, respectively). The types of MSDs, including their corresponding standards, are displayed in the table below.

Table 1: MSD Types		
Type I	**Type II**	**Type III**
Flow-through device. Sewage is treated onboard, typically via maceration and disinfection, prior to discharge. May be used only on vessels less than 65 feet in length. Must produce an effluent having a fecal coliform count not greater than 1,000 per 100 milliliters and no visible floating solids.	Flow-through device. Sewage is treated onboard, typically via biological treatment and disinfection, prior to discharge. May be used on vessels of any size. Must produce an effluent having a fecal coliform count not greater than 200 per 100 milliliters, and suspended solids not greater than 150 milligrams per liter.	Holding tank. Sewage is retained onboard. May be used on vessels of any size. Must be designed to prevent overboard discharge. Proper disposal of holding contents is required.

1.2.2 No-Discharge Zones

As described above, under the CWA Section 312(f), a state may completely prohibit both treated and untreated vessel sewage discharges in all or some of the waters within the state through the designation of a no-discharge zone. There are three different types of no-discharge zone designations that the state may pursue. The designation types are commonly referred to by their statutory authority – (f)(3), (f)(4)(A), and (f)(4)(B). No-discharge zones are intended to protect specified waters where the quality of such waters requires greater protection than afforded by the federal standards of performance, which already prevents the discharge of raw and inadequately treated sewage. To establish a no-discharge zone under any one of the three types, the state must first apply to EPA to establish a complete prohibition on sewage discharges pursuant to the regulatory requirements detailed in 40 CFR Part 140.

In addition to these nationally applicable no-discharge zone provisions, section 1410 of Title XIV - Certain Alaskan Cruise Ship Operations, contained in section 1(a)(4) of Pub. L. 106-554, authorizes the State of Alaska to pursue a complete prohibition on discharges of graywater and sewage from cruise vessels. The no-discharge zone can apply to "some or all of the waters of the Alexander Archipelago or the navigable waters of the United States within the State of Alaska or within the Kachemak Bay National Estuarine Research Reserve." Alaska must determine that the protection and enhancement of the quality of the proposed waters require greater environmental protection and apply to EPA in the same manner as the no-discharge zone provisions under the CWA Section 312(f).

Importantly, 40 CFR 140.3(a)(1) prohibits treated and untreated sewage discharges in certain waters outside of no-discharge zone designations, including "freshwater lakes, freshwater reservoirs or other freshwater impoundments whose inlets or outlets are such as to prevent the ingress or egress by vessel traffic subject to this regulation…[and]…rivers not capable of navigation by interstate vessel traffic subject to this regulation." The following sections explain the differences between the three no-discharge zone designation types, including the respective roles of the state and EPA for each type, and corresponding application components.

CWA Section 312(f)(3) No-Discharge Zones

> "After the effective date of the initial standards and regulations promulgated under this section, if any State determines that the protection and enhancement of the quality of some or all of the waters within such State require greater environmental protection, such State may completely prohibit the discharge from all vessels of any sewage, whether treated or not, into such waters, except that no such prohibition shall apply until the Administrator determines that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for such water to which such prohibition would apply. Upon application of the State, the Administrator shall make such determination within 90 days of the date of such application."
> 33 U.S.C. 1322(f)(3)

Prior to establishment of the first type of no-discharge zone – under CWA Section 312(f)(3) (hereafter, "(f)(3)") – the state (1) determines that there is a need for a complete prohibition, and (2) applies to EPA for a determination of whether adequate pumpout facilities are reasonably available for the removal and treatment of sewage generated by vessels operating in the waterbody to which the no-discharge zone would apply.

Per EPA implementing regulations at 40 CFR 140.4(a), the state's application for this type of designation must include seven specific information requirements. The application must include the following:

(1) A certification that the protection and enhancement of the waters described in the petition require greater environmental protection than the applicable Federal standard;
(2) A map showing the location of commercial and recreational pumpout facilities;
(3) A description of the location of pumpout facilities within waters designated for no discharge;
(4) The general schedule of operating hours of the pumpout facilities;
(5) The draft requirements on vessels that may be excluded because of insufficient water depth adjacent to the facility;
(6) Information indicating that treatment of wastes from such pumpout facilities is in conformance with Federal law; and,
(7) Information on vessel population and vessel usage of the subject waters.

If EPA makes an affirmative determination that adequate facilities are reasonably available, EPA will publish a notice in the *Federal Register* announcing the determination and detailing the Agency's decision-making process.

More detailed instructions on EPA's interpretation of the application requirements and additional information that may enhance a state's application are provided in Section 2.0.

CWA Section 312(f)(4)(A) No-Discharge Zones

> "If the Administrator determines upon application by a State that the protection and enhancement of the quality of specified waters within such State require such a prohibition, he shall by regulation completely prohibit the discharge from a vessel of any sewage (whether treated or not) into such waters." 33 U.S.C. 1322(f)(4)(A)

For designations under CWA Section 312(f)(4)(A) (hereafter, "(f)(4)(A)"), the state applies to EPA for a determination whether specified waters require greater protection than applicable federal standards. Per EPA's regulations (40 CFR 140.4(b)), the state's written application for an (f)(4)(A) no-discharge zone must include the "identification of water recreational areas, drinking water intakes, aquatic sanctuaries, identifiable fish-spawning and nursery areas, and areas of intensive boating activities." Following receipt of a complete application, if EPA makes an affirmative determination, EPA then proceeds by proposing and issuing a regulation instituting the prohibition. In the federal rulemaking, EPA first proposes a notice of proposed rulemaking in the *Federal Register* in accordance with 5 U.S.C. 553. After receipt and consideration of public comments, and any modifications to the proposal as appropriate, EPA promulgates the final regulation in the Code of Federal Regulations, the official record of all federal regulations.

More detailed instructions on EPA's interpretation of the application requirements and additional information that may enhance a state's application are provided in Section 3.0.

CWA Section 312(f)(4)(B) No-Discharge Zones

> "Upon application by a State, the Administrator shall, by regulation, establish a drinking water intake zone in any waters within such State and prohibit the discharge of sewage from vessels within that zone." 33 U.S.C. 1322(f)(4)(B)

The final type of no-discharge zone designation is described in CWA Section 312(f)(4)(B) (hereafter, "(f)(4)(B)") and is applicable only for drinking water supply intakes. Per 40 CFR 140.4(c), the state's application for an (f)(4)(B) designation describes the location and characteristics of the drinking water supply intake(s), identifies the specific waters for which prohibition is requested, provides a map with the latitude and longitude of the waters designated as drinking water intake zone(s), and includes a statement that provides the basis of need for the requested zone(s). Following the receipt of a complete application, EPA uses the same processes as it does for (f)(4)(A) no-discharge zones. In this case, the federal regulation establishes a drinking water intake zone to completely prohibit sewage discharges from vessels.

More detailed instructions on EPA's interpretation of the application requirements and additional information that may enhance a state's application are provided in Section 4.0.

1.2.3 Applicability to Vessels Owned and Operated by the United States

Per CWA Section 312(d), the performance standards promulgated by EPA for MSDs, as well as the sewage discharge prohibitions established by the designation of no-discharge zones, apply to vessels owned and operated by the United States. However, the standards and regulations do not apply if the Secretary of Defense determines that compliance would not be in the interest of national security. With respect to vessels owned and operated by the Department of Defense (DoD), DoD has issued regulations that identify exemptions for specific circumstances and vessels where compliance would detract from the vessels' military characteristics, effectiveness, or safety. For more information, see DoD Manual 4715.06, Volume 1, "Regulations on Vessels Owned or Operated by the Department of Defense: Marine Sanitation Devices (MSDs)" (July 29, 2022). A state interested in designating an area as a no-discharge zone should work with local military installations that may be affected to identify any implications for

military vessels and report such implications to EPA in the state's application. Among other things, useful information for a state to confirm with affected installations would include whether adequate facilities for the safe and sanitary removal of sewage from military vessels are reasonably available, as well as whether the relevant military installations support or oppose the proposed no-discharge zone and why. Throughout the application, the state should clearly identify locations where vessels owned and operated by the United States are expected versus other vessels (e.g., commercial vessels, recreational vessels).

1.2.4 Other Vessel Discharge Regulations

The vessel sewage regulations described in this guidance document apply to all vessels, except as identified in Section 1.2.3. Additionally, the discharge of sewage and graywater from cruise vessels operating in Alaska is further regulated by Title XIV - Certain Alaskan Cruise Ship Operations, as implemented by the USCG (33 CFR Part 159, Subpart E "Discharge of Effluents in Certain Alaskan Waters by Cruise Vessel Operations"). The USCG's regulations apply to each cruise vessel authorized to carry 500 or more passengers operating in the waters of the Alexander Archipelago and the navigable waters of the U.S. within the State of Alaska and within the Kachemak Bay National Estuarine Research Reserve, and address discharge requirements, inspections, sampling and reporting, and enforcement.

While vessel sewage is regulated under CWA Section 312(a)-(m), other subsections of CWA Section 312 regulate other discharges incidental to the normal operation of a vessel and vary based on the type of vessel, including vessels of the Armed Forces, certain commercial vessels, and recreational vessels. The Uniform National Discharge Standards (UNDS) program under CWA Section 312(n) establishes national performance standards for incidental discharges from vessels of the Armed Forces. At the same time, the Clean Boating Act (CBA) regulates discharges incidental discharges from recreational vessels under CWA Section 312(o). Additionally, the Vessel Incidental Discharge Act (VIDA) amended the CWA to add Section 312(p) for the regulation of incidental discharges from non-military, non-recreational vessels operating in the waters of the United States or the waters of the contiguous zone. Examples of other regulated discharges incidental to the normal operation of a vessel include, but are not limited to, discharge of biofouling organisms from vessel equipment and systems, ballast water, bilge water, exhaust gas cleaning system washwater, graywater, and oil water separator effluent.

Finally, some vessels may be subject to the requirements of the International Convention on the Prevention of Pollution from Ships (MARPOL). MARPOL contains six technical Annexes addressing different forms of shipborne pollution with the goal of preventing and minimizing pollution from ships. Annex IV represents the principle set of international regulations for vessel sewage discharges from certain vessels engaged in international voyages. The U.S. is not party to Annex IV, however, U.S. vessels operating abroad may be subject to its requirements. Additionally, vessels from flag Administrations that are party to Annex IV must adhere to both U.S. domestic regulations and Annex IV requirements pertaining to vessel sewage discharges while operating in U.S. waters.

Further information on these domestic and international vessel discharge regulations is available in Appendix B. The requirements and recommendations discussed in this guidance document, however, are specific to vessel sewage no-discharge zones established under CWA Section 312(f).

1.3 Additional Information on No-Discharge Zones

Sections 2.0, 3.0, and 4.0 provide detailed explanations of EPA's interpretation of the application requirements for (f)(3), (f)(4)(A), and (f)(4)(B) designations, respectively. The state should consider the following questions to determine the appropriate designation to seek for a particular waterbody:

- **Are there specific goals to be accomplished via a no-discharge zone designation?**
  For waterbodies where the primary goal of the designation is to protect drinking water intakes, the state should pursue an (f)(4)(B) designation (see Section 4.0). For waterbodies where the primary goal of the designation is environmental protection, the state should consider either an (f)(3) or (f)(4)(A) designation.

- **Is there existing pumpout infrastructure to support the resident and transient vessel population?**
  For waterbodies with adequate pumpout facilities that are reasonably available for the entire vessel population, an (f)(3) designation likely presents the most expeditious approach to establish the no-discharge zone.

- **Does the state seek enhanced protections of the waterbody for important recreational uses or for protection of species or habitat?**
  For waterbodies for which the state has heightened or urgent water quality concerns but may not yet have a robust existing infrastructure for the removal and treatment of vessel sewage, the state should consider applying to EPA to establish an (f)(4)(A) no-discharge zone. However, EPA emphasizes that an application for an (f)(4)(A) designation must be based on a compelling need for enhanced protections for the proposed waters. This designation type is not intended as a means to avoid the facility requirements identified for (f)(3) applications. EPA further notes that compliance with an (f)(4)(A) designation may not be feasible for affected vessel operators if the waterbody lacks pumpout infrastructure entirely.

An important additional factor to consider is that (f)(3) no-discharge zones are ultimately established by the state after an EPA determination, whereas both (f)(4)(A) and (f)(4)(B) no-discharge zones are established directly by EPA through federal regulation. This difference affects the roles of the state and EPA, as well as the associated processes and the expected time to establish the prohibition. For (f)(3) designations, EPA's role is narrowly defined to determining whether adequate sewage removal and treatment facilities are reasonably available to all vessels. If EPA determines that such facilities are reasonably available, the state has discretion to establish the no-discharge zone under state law. Additionally, the CWA directs EPA to make a determination within 90 days. For (f)(4)(A) and (f)(4)(B), by contrast, the state submits an application and EPA determines whether to proceed through a federal rulemaking process to grant the application, meaning that EPA ultimately determines the need to establish the no-discharge zone. The CWA does not provide a time limit for EPA's rulemaking under (f)(4).

Some of the key features of the three designation types are provided in the table below.

Table 2: Key Features of Designation Types			
	(f)(3)	**(f)(4)(A)**	**(f)(4)(B)**
Primary Goal	Environmental protection	Environmental protection	Drinking water intake protection
Summary	State may establish the no-discharge zone if the state determines that the waterbody requires greater environmental protection than provided by the current federal standards and EPA determines that adequate facilities for the removal and treatment of sewage are reasonably available	If EPA determines, upon application by a state, that the protection and enhancement of specified waters requires sewage discharges to be prohibited, EPA will establish the no-discharge zone through a federal regulation.	State may apply to EPA to establish a no-discharge zone around a drinking water intake through a federal regulation.
Availability of removal and treatment facilities	Required; Preferred approach when facilities are already available	Not required; Preferred approach when there is an urgent need for protection, but adequate infrastructure does not yet exist	Not required; Preferred approach to enhance protection of drinking water from a waterbody
Responsibility for establishment of the no-discharge zone	State, following an affirmative determination by EPA	EPA	EPA
EPA role	Determine that adequate pumpout facilities are reasonably available to all vessels	Determine the need for and whether to establish a no-discharge zone through the federal rulemaking process	Determine whether to establish a no-discharge zone through the federal rulemaking process
Determination timeline	90 days	Not specified	Not specified

Regardless of the type of designation being pursued, EPA strongly encourages the state to engage with potentially affected stakeholders, including the local recreational boating community and commercial vessel operators. These stakeholders are well-positioned to provide early feedback on the feasibility and appropriateness of a no-discharge zone designation and can also provide crucial information for application development. Additionally, the state should work closely with the appropriate EPA Regional

> Information that EPA interprets that a state is required to provide to comply with EPA's regulations and to allow EPA to effectively evaluate an application is identified in the following sections using the term "must." This guidance document also suggests optional information that the state may consider including to enhance the application. Information that EPA recommends the state provide is identified in the following sections using the term "should."

office during the drafting stages of the application. Prior to formal submission, EPA recommends that the state request informal review by EPA, including the appropriate EPA Regional office, to ensure that the application contains all required information. If necessary or useful, EPA may request additional information or seek clarifications during this informal review to provide more informed feedback to the state. While such informal review is voluntary, it may result in a more efficient review of a formal application.

The information provided by the state in the application should be well-supported and verifiable. In circumstances where the origin of provided information is unclear, EPA may consult further with the state. Submission of optional information can provide a clearer depiction of the unique circumstances in a waterbody, which can assist EPA in arriving at more informed determinations. However, states are not required to provide optional information and an application will not be marked incomplete if this information is not provided or available. In circumstances where a state submits an application with missing and/or different information from the regulatory requirements, EPA has the discretion to return the application, obtain the information independently, or issue a tentative determination noting any application deficiencies for public comment.

Appendix D contains information on model public outreach campaigns and enforcement techniques, two factors that can contribute to successful implementation and compliance with a newly established no-discharge zone. The information provided in Appendix D is for informational purposes only and Appendix D does not, and is not, intended to impose additional requirements or expectations on a state.

Throughout this document, the term “waterfront facilities” is used to represent all marinas, ports, docks, and harbors. Additionally, this guidance document uses the commonplace spelling of “draft” in lieu of the alternative spelling (“draught”) used in EPA regulations (40 CFR Part 140) but retains the same meaning. When asked to provide geographic coordinates, the state should provide the latitude and longitude with six significant digits and specify the horizontal datum.

Section 2.0: Applications under CWA Section 312(f)(3)

This section explains the application process for establishing a no-discharge zone under CWA Section 312(f)(3). An (f)(3) designation is appropriate when the state's primary goal for the designation is environmental protection and adequate pumpout infrastructure for the removal and treatment of sewage is available for the vessel population.

For a state to establish an (f)(3) no-discharge zone, the state must determine that the waterbody requires greater environmental protection than the current federal discharge performance standards provide, and EPA must determine that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for such water to which the prohibition would apply. After the state submits a complete application, EPA reviews the application and proposes an affirmative or negative determination for public comment. After careful consideration of comments received, EPA then issues a final determination through notice in the *Federal Register*.

This section is presented in two subsections:

(1) A summary of the state's responsibilities in developing and submitting a complete application to EPA, as well as additional optional information that may enhance a state's application.

(2) A summary of EPA's responsibilities in evaluating the application and issuing a determination.

A sample application is provided in Appendix A to illustrate the type of information that is required by 40 CFR 140.4(a) and the optional information that may be included to facilitate and expedite processing of the application.

2.1 Development and Submission of an Application by the State

EPA's implementing regulations (40 CFR 140.4(a)(1)-(7)) list the seven required components of a state's application. An application must contain the seven required components to be considered a complete application by EPA. In circumstances where a state submits an application with missing and/or different information from the regulatory requirements, EPA has the discretion to return the application, independently obtain the information, or issue a tentative determination noting any application deficiencies for public comment. This section walks through EPA's interpretation of the required and optional components of each requirement to assist states in developing applications.

2.1.1 Application Requirement #1: Certification of Need

> "A certification that the protection and enhancement of the waters described in the petition require greater environmental protection than the applicable Federal standard." 40 CFR 140.4(a)(1)

Required Information

The application must include a general overview of the proposed no-discharge zone, including both geographic coordinates (latitude and longitude) and a detailed narrative description of the proposed

boundaries of the designation. The application must also address the state's determination that the proposed area requires greater environmental protection than provided by the currently applicable federal standards of performance.

Optional Information

The certification of need should include:

- A description of resources detrimentally affected by treated sewage discharges (e.g., shellfish harvest areas and commercial shellfish farm operations, fish spawning areas, recreational beaches), including how these resources are detrimentally affected and how the prohibition of sewage discharges would remedy this harm.
- Water quality data, such as fecal coliform counts, demonstrating localized fecal contamination.
- Water quality data for other pollutants of concern, such as nutrients, as well as estimations of the loading of these pollutants from vessels in the proposed area.
- Number and/or extent of beach and shellfish bed closures related to fecal contamination in years preceding the application.
- An estimation of fecal bacteria or pathogen loads from vessels in the proposed area that justifies a complete prohibition of treated discharges. The state may wish to include estimations of other contributors, as well.
- A description of any additional characteristics of the proposed area, such as flushing rate, that provide a rationale for designating a no-discharge zone.

If the proposed waters are affected by other relevant sources of pollution, such as combined sewer overflows, the state should identify these contributors and briefly describe how a no-discharge zone designation fits into any broader pollution control strategies undertaken by the state.

Recommended Information Sources

Water quality information can be obtained from the state's Integrated Reports that combine CWA Section 305(b) water quality assessment reporting with CWA Section 303(d) listing information. These reports provide water quality information and data for major waterways in the state. More localized data may also be available from the local (county or municipal) water authority, the state's shellfish and beach monitoring programs, and recent fish and shellfish advisories.

2.1.2 Application Requirement #2: Map of Pumpout Facilities

> "A map showing the location of commercial and recreational pumpout facilities." 40 CFR 140.4(a)(2)

Required Information

Existing stationary facilities and the range of coverage for mobile pumpout facilities serving recreational and commercial vessels must be clearly indicated on a map of the proposed no-discharge zone. If the proposed area is large, use of more than one map may be appropriate for the application. However, if more than one map is used, an overview map showing the entire area should be included. The other maps should be referenced on the overview map.

The map(s) must include the following information:

- Scale;
- North orientation symbol;
- Locator map (smaller map which places the proposed area into context);
- Delineation of proposed no-discharge zone (i.e., dotted line, shading, coloring, or any other identifying mark);
- Identification of all bodies of water;
- Identification of nearby cities and towns; and,
- Identification of pumpout facilities with unique identifying letters or numbers, for reference and discussion purposes elsewhere in the application.

For stationary pumpout facilities, including pumpout carts that remain within a single waterfront facility, the location of all existing recreational and commercial pumpout facilities in the proposed area must be clearly marked.

For mobile facilities, including sewage hauler trucks ("pumpout trucks") and pumpout boats/barges, the maps must indicate:

- Physical addresses of the origin point of the pumpout facility (i.e., the location where the truck or boat is kept) using a different symbol than stationary facilities; and,
- Separate maps indicating the geographic service area for each truck, sewage truck company, boat/barge, or sewage boat/barge company. Use as many maps as needed to clearly visualize each service area, such as through use of lightly shaded areas. Use different colors for each company or individual facility, as appropriate, on any individual map.

Optional Information

States should consider using GIS mapping and spatial analyses to evaluate the distribution of available pumpout facilities and vessel traffic patterns. Such an approach would be useful to accurately identify resources and to explain whether and how vessels using the proposed waters have reasonable access to available facilities.

States should explain how the geographic service areas of mobile facilities was determined, such as through identification of the area historically served by a facility or the intended service area of the mobile facility operator. The state may also wish to include a brief explanation of the map(s) used to present the geographic distribution of the pumpout facilities in the proposed area, including the code or reference system used to identify the different types of facilities. This information would be helpful in understanding pumpout availability and coverage within the proposed waters.

Due to the unique characteristics of mobile facilities, applications relying on mobile facilities should provide estimations of response time to vessels' requests for pumpout services and ability to schedule services ahead of time. The application should also identify the distance, in time or miles, each operator is prepared to travel to service a vessel or a description of the portion of the proposed area within the service areas of such operators. Service area information should form the basis of the pumpout truck maps. Inclusion of this information assists EPA in evaluating the availability of these pumpout facility options to the vessel population that would be affected by a no-discharge zone designation.

Recommended Information Sources

Information on the location of pumpout facilities may be obtained from a recent guide or list of marinas or water recreation facilities, though the state should verify that the information provided in the guide is current to the extent possible. The state agency overseeing the state's boating programs may also have a recent inventory of the state's marinas (e.g., in states receiving grant funding under the Clean Vessel Act - see Appendix B for more information on the Clean Vessel Act). Maps are available from a variety of sources including county planning offices, the U.S. Geological Survey, and the U.S. National Oceanic and Atmospheric Administration.

2.1.3 Application Requirement #3: Location of Pumpout Facilities

> "A description of the location of pumpout facilities within water designated for no discharge." 40 CFR 140.4(a)(3)

Required Information

In addition to the map developed for Application Requirement #2, the state must provide a narrative description of the location of each pumpout facility in the proposed no-discharge zone. This discussion may be organized around each waterfront facility, instead of each pumpout facility.

Optional Information

The descriptions should include the following identifying information:

- The number of pumpout facilities at each waterfront facility.
- The type of pumpout system(s) (i.e., portable, mobile, stationary, remote operated multi-station) at each waterfront facility. See the reference box on the following page for a brief description of the different system types.
- The specific location of each pumpout facility within the waterfront facility.

Information is best presented in table format and should include:

- Location and contact information (e.g., waterfront facility name, address, phone number);
- Code(s) used in the pumpout facility map to identify unique pumpout facilities;
- Waterbody in which the waterfront facility is located;
- Number of pumpout facilities by type (i.e., portable, mobile, stationary, remote operated multi-station);
- Fees (e.g., cost per gallon) to pump out at each pumpout facility;
- Type(s) of vessels that can be serviced (e.g., recreational vessels; large commercial vessels) at each pumpout facility and any service restrictions (e.g., whether access is limited to certain vessels or customers);
- Draft, berth, width and/or height limitations at each pumpout facility;
- Operating hours of each pumpout facility; and
- Pumpout facility operating capacity (i.e., gallons per minute of flow) including working daily capacity and average available capacity (if limited by the size of an onsite holding tank).

To document the collection and validation of pumpout facility information to fulfill this and the other requirements outlined throughout Section 2.1, the state should briefly summarize verbal or written communications with facility operators. Written communications, such as over email, as well as notes taken during phone conversations with facility operators should be maintained as records.

Recommended Information Sources

The state will likely need to conduct an inventory of the waterfront facilities in the area and contact facility operators directly to collect pumpout facility information.

Types of Facilities

Stationary Pumpout System

The most common type of pumpout system is positioned at a centralized stationary location (e.g., pier, dock, or bulkhead) in a marina. A stationary pumpout facility has one or more hoses available for pumping out holding tanks. Vessels temporarily dock, attach a flexible hose to the vessel's holding tank deck fitting, and the pump empties the holding tank contents into an onshore holding tank, a truck equipped with a holding tank, or a wastewater collection and treatment system. A stationary pumpout facility may also be referred to as a marina-wide system because it services the entire marina from one location, so each vessel must come to the dock to use the pumpout.

Mobile Pumpout System

A mobile pumpout system is similar to a stationary pumpout system, however, the equipment can be moved to where it is needed. The most common mobile pumpout facilities are pumpout boats and trucks. Pumpout boats are more adaptable than stationary systems because the pumpout can relocate to wherever a vessel is moored, docked, or anchored and, therefore, can usually accommodate vessels with deeper drafts than shoreside facilities. The capacity of a vessel-based pumpout system may be more limited than a stationary one because the sewage pumped out of vessels is stored in a holding tank onboard and then emptied later into either a stationary pumpout or directly into an onshore wastewater collection and treatment system.

Portable Pumpout System

Portable pumpout systems are typically carts equipped with a pump mechanism and a small holding tank. The entire system is moved around the marina to service vessels docked at any location. The contents of the system's holding tank are emptied periodically into a larger holding tank or to an on-site wastewater collection and treatment system. A portable pumpout collection system usually requires more operation and maintenance attention than the other collection systems.

Remote Operated Multi-Station System

The remote operated multi-station system, also known as a slipside system, has permanently installed pumpout hoses that connect to each vessel slip in the marina. These systems are less common primarily because of the greater cost of design and installation. The system provides continuous wastewater collection on demand; therefore, a remote operated multi-station system is useful in areas with a high percentage of “live-aboard” vessels. The wastewater collected through each hose is typically fed into a central holding tank for disposal.

Portable Toilet Dump Stations

Many smaller vessels are only equipped with portable toilets. The contents of portable toilets should be disposed of in dedicated dump stations. While some marinas use a designated stall in the public restrooms as a dump station, EPA does not recommend this approach as it may be unsanitary. Dump stations are not described further in this guidance document because the designations of a no-discharge zone (and the CWA’s marine sanitation device provisions generally) apply only to vessels with installed toilets that are therefore required to operate MSDs.

2.1.4 Application Requirement #4: Schedule of Operating Hours of the Pumpout Facilities

> "The general schedule of operating hours of the pumpout facilities." 40 CFR 140.4(a)(4)

Required Information

The application must include the operating hours for each stationary, portable, and mobile pumpout facility and must include any daily or seasonal variability.

Optional Information

The operating hours for each pumpout facility should be shown in the table described in Section 2.1.3. In the same table, EPA recommends that the state identify the fee schedule (for example, based on per use or per gallon pumped) charged by each pumpout facility. If the fee is less or waived for customers of the waterfront facility, then the fee for both the general public and customers should be provided. The application should also describe whether each pumpout facility is available to the public or has limited access to certain vessels or customers. This information would assist EPA in its evaluation of the adequacy and reasonable availability of facilities by identifying vessels that may excluded by specific pumpout facilities due to cost or access restrictions.

Lastly, the state should include information regarding the maintenance plans, if available, for each waterfront facility. This information provides insight into whether individual pumpout facilities are likely to be maintained and therefore continue to be available to the vessel population.

Recommended Information Sources

Operating hours and fee schedule (if included) may be obtained by contacting each pumpout facility operator.

2.1.5 Application Requirement #5: Vessel Draft Requirements at Facilities

> "The draught requirements on vessels that may be excluded because of insufficient water depth adjacent to the facility." 40 CFR 140.4(a)(5)

Required Information

Insufficient water depth, either directly adjacent to a pumpout facility or at critical access points to a waterfront facility itself, may result in a pumpout facility being inaccessible, and therefore unavailable, to certain vessels operating in the proposed waters. For EPA to determine the extent to which vessels may be excluded, the application must identify the mean low water depth at each pumpout facility and the corresponding vessel draft limitations.

Optional Information

Other physical limitations associated with facility access should be included in the table described in Section 2.1.3.

To assist EPA in assessing the reasonable availability of adequate facilities, the state should also include a short description of the following:

- *Maximum berth.* The size of the dock adjacent to the pumpout facility may limit vessels over a certain length from accessing the facility.
- *Maximum width and/or height (both total height and height above the waterline) of vessels able to access each pumpout facility.* If bridges, other overpasses, or pinch points exclude vessels over a certain height or width from accessing a facility in the proposed no-discharge zone, then these restrictions should be included in the application.
- *Percentage of vessels and associated vessel types excluded from using pumpout facilities in the area.* The state should estimate how many, or what percentage of, all vessels operating in the proposed no-discharge zone would be unable to use or access each facility in the area, due to physical, legal, or other restrictions, and of which type. The application should specify if there would be no known or anticipated vessel exclusions.
- *Types of vessels serviced by each pumpout facility.* The state should indicate any other relevant restrictions to access and use of a facility, such as whether the facility is public access or private/member-only. Additionally, the state should identify what types of vessels (e.g., recreational or commercial vessels; small or large) can be serviced by each facility.
- *Connection specifications and sewage pump flow rate requirements*. The state should identify the available connection options and pump flow rate at each pumpout facility.

Recommended Information Sources

States may obtain water depth information from the electronic nautical charts available from the National Oceanic and Atmospheric Administration. Alternatively, this information can also be found in boating almanacs, waterway guides, and GPS-based navigation systems. The state should make a reasonable attempt to verify the accuracy of depth information with each waterfront facility.

2.1.6 Application Requirement #6: Waste Treatment

> "Information indicating that treatment of wastes from such pumpout facilities is in conformance with Federal law." 40 CFR 140.4(a)(6)

Required Information

The application must demonstrate that each pumpout facility, including mobile facilities, disposes of collected waste from vessel holding tanks in conformance with federal law. Examples of disposal methods include:

- Discharge directly to the wastewater collection system of a permitted wastewater treatment facility.
- Discharge to a holding tank with removal and transport by a licensed septage hauler to a

permitted wastewater treatment facility. The application should identify the size of the onsite holding tank and, if available, the frequency with which it is serviced by the septage hauling company.

- Discharge to a permitted "package" treatment plant that is authorized to discharge back into coastal waters after treatment.
- Discharge to an on-site septic system.

The state must provide an estimate for the volume of sewage generated by vessels that will require treatment and explain the basis for the estimate. For each pumpout facility, the state must explain how collected sewage is treated or disposed to meet federal law and must identify the facility (or facilities) where treatment will ultimately occur. The application must also describe how sewage treatment facilities are regulated by the state and any relevant noncompliance associated with the treatment facilities in recent years.

Optional Information

The state should include available data and information on the design capacity of sewage treatment facilities and actual flows to explain whether these facilities could accommodate the incremental increase in volume of sewage that these facilities would receive as a result of a designation. If the adequacy of treatment may be affected by additional factors, such as increased loading during particular times of year or combined sewer overflows during wet weather months, the state should include this information.

Recommended Information Sources

The state can contact each waterfront facility and mobile pumpout company to obtain information on waste disposal practices. Sewage treatment facilities that are permitted through the National Pollutant Discharge Elimination System (NPDES) have permit-defined design capacities and actual flows are reported in NPDES Discharge Monitoring Reports.

2.1.7 Application Requirement #7: Vessel Population and Usage

> "Information on vessel population and vessel usage of the subject waters." 40 CFR 140.4(a)(7)

Required Information

The application must include an estimate of the total number of vessels that use the proposed area, including both regular users (vessels originating within the proposed area) and transient users (vessels originating outside, but traveling through, the proposed area). The state must ensure that the vessel population estimate(s) are representative of typical operations, otherwise, it may be appropriate to consider a few years of historic usage. The application must also provide an estimate of the number of recreational vessels versus those used for commercial purposes. To the extent possible, the application must include a breakdown of the number of commercial vessels by class (e.g., tugboats, cruise ships, ferries) and size (e.g., length, height) and the times of the year that these vessels are expected to

operate within the proposed waters. Regarding vessel usage, the state must also identify any relevant navigation routes used by vessels that would be affected by a no-discharge zone designation.

Optional Information

As expressed in Section 2.1.2, states should consider using GIS mapping and spatial analyses to evaluate the distribution of available pumpout facilities and vessel traffic patterns. Such an approach would be useful to accurately identify resources and to explain whether and how vessels using the proposed waters have reasonable access to available facilities.

As appropriate, the state should identify any unique characteristics of the vessel population (or portion therein), for example, time constraints for operations or particular pump out requirements. To determine the number of pumpout facilities required for the recreational vessel population, EPA considers peak periods of usage (e.g., a holiday weekend). Lastly, the state's application should include a description of the type and number of small entity vessels[1] that will be impacted by the no-discharge zone and demonstrate that adequate facilities are reasonably available to these vessels.

For ease of preparation and presentation, the state should consider developing a table to present the vessel population numbers for the application. As described above, the state should provide available details on the vessel population, such as vessel lengths and existing sewage handling practices.

Recommended Information Sources

More information on EPA's evaluation of vessel population and usage information is provided in Section 2.2. States will likely use more than one source and may need to make qualified assumptions to derive the estimates. All informational sources and assumptions should be documented, explained, and verifiable. To the extent possible, information on vessel population and usage should be obtained from, or validated with, the affected vessel population.

For smaller proposed areas, the state may be able to rely on localized data collection to estimate vessel population and use for the application. For example, the state can begin by contacting the waterfront facilities in the area because waterfront facilities often retain visitation and long-term mooring registration records, including information on the number of slips and vessels launched. Another possible source of information would be the relevant state boating law administration office. State boating offices may be able to provide boating population statistics by county and length of vessel. The state boating law administrator, or the local Sea Grant College Program, may also be able to identify relevant information sources. Another potential source would be a state's Comprehensive Outdoor Recreational Plan prepared, for example, by the state's Department of Parks and Recreation (or

[1] The Small Business Administration's (SBA) Office of Advocacy generally defines a small business as an independent business with fewer than 500 employees. Alternatively, states may use the SBA size standards, organized by North American Industry Classification System (NAICS) code, that are used in SBA loan programs and government contracting. The table of size standards can be accessed at https://www.sba.gov/document/support-table-size-standards.

equivalent). If helpful, the state may adapt assumptions from national statistics, such as the USCG's National Recreational Boating Surveys.

For proposed areas with significant commercial traffic, states are encouraged to consult Automatic Information System (AIS) data. Per 33 CFR 164.46(a), AIS is a maritime navigation safety communications system standardized by the International Telecommunication Union and adopted by the International Maritime Organization that provides vessel information, including the vessel's identity, type, position, course, speed, navigational status and other safety-related information automatically to appropriately equipped shore stations, other ships, and aircraft; receives automatically such information from similarly fitted ships, monitors and tracks ships; and exchanges data with shore-based facilities. More information on AIS is available on the U.S. Coast Guard's Navigation Center website titled, "Automatic Identification System (AIS) Overview." Through this site, local, state, and federal government agencies can request historical or real-time U.S. Coast Guard Nationwide AIS (NAIS) data. Additionally, some NAIS historical data is available at MarineCadestre.gov. The U.S. Army Corps of Engineers' "Waterborne Commerce Statistics Center" also provides information on the number of trips made by foreign and domestic commerce ships into certain ports and harbors. For information on ferry operations, consult the National Census of Ferry Operators, compiled by the U.S. Department of Transportation's Bureau of Transportation Statistics.

2.2 Evaluation of an Application by EPA

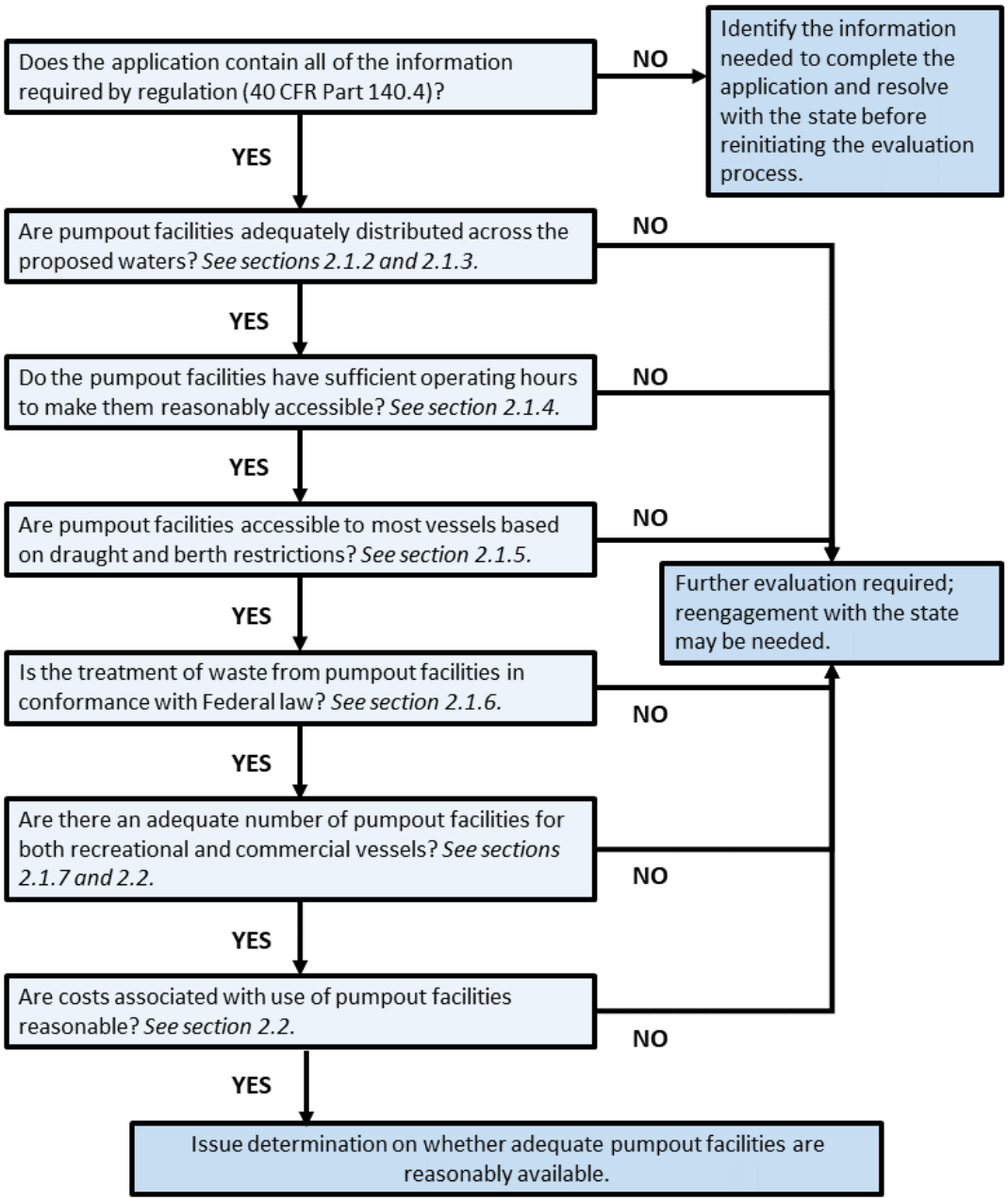
After the state submits its complete application for a no-discharge zone, EPA must determine whether adequate facilities for removal and treatment of vessel sewage are reasonably available for all vessels operating in the waters of the proposed no-discharge zone. The state cannot proceed with designation of the no-discharge zone until EPA makes an affirmative determination about the reasonable availability of adequate facilities. Per CWA Section 312(f)(3), EPA's determination is based on two related criteria: (1) whether facilities are adequate to service the vessel population, and (2) whether facilities for removal and treatment of vessel sewage are reasonably available.

To assist with EPA's review of an application and standardize EPA's approach, EPA developed two resources -- the Recreational Vessel Worksheet and the No-Discharge Zone Cost Analysis Tool (Tool). The Recreational Vessel Worksheet is a fillable form that, using both default values as well as values supplied in an application, generates a recommended number of pumpout facilities to provide a reliable level of service for the recreational vessel population within a proposed no-discharge zone. The Recreational Vessel Worksheet can be found in Section 2.2.1, "Recreational Vessels."

The Tool, on the other hand, is a spreadsheet used primarily for the commercial vessel population and contains two parts. First, the Tool relies on a screening analysis to calculate how frequently the demand for pumpout facilities (i.e., the volume of sewage produced by commercial vessels) is projected to exceed commercial vessel pumpout facility capacity (i.e., the volume of sewage that can be pumped out). Second, the Tool generates an estimate of the percent increase in baseline operating costs that commercial vessels may incur as a result of using pumpout facilities in the proposed no-discharge zone. EPA's determination is about the reasonable availability of adequate facilities rather than the reasonableness of a state's establishment of a no-discharge zone. By considering these costs, EPA fulfills its statutory obligation to verify that adequate pumpout facilities are reasonably available prior to issuing an affirmative determination. More details on EPA's approach to evaluating applications as they pertain to commercial vessels are available in Section 2.2.2, "Commercial Vessels."

EPA's cost assessments typically would focus on cost implications for the commercial vessel population because construction and maintenance of pumpout facilities for recreational vessels can be supported through federal grants under the Clean Vessel Act, such that the fee for facility use by recreational vessels is likely to be small, if not free. As a result, adequate pumpout facilities are more likely to be reasonably available for recreational vessels than for commercial vessels.

Figure 1: EPA's Evaluation Process



As described in the figure above, EPA's process in evaluating an application follows and is consistent with the application requirements in EPA's regulations in 40 CFR 140.4. The first step in EPA's review is

determining whether an application is complete upon receipt. States are encouraged to work with the appropriate EPA Regional office in advance of submission to ensure that the application contains all the required information. Next, EPA determines the extent to which pumpout facilities identified in the application are geographically distributed, accessible, and provide for the treatment of waste in accordance with federal law. To understand how these factors relate to the broader adequacy and availability of facilities, EPA evaluates the size and nature of the vessel population and its needs for pumpout facilities in the proposed no-discharge zone. EPA's assessment, among other things, compares the volume of sewage that can be removed by pumpout facilities in an area, given the number of facilities and capacity of each, to the volume of sewage generated by vessels in the proposed no-discharge zone. The design of some pumpout facilities may limit their accessibility or use to either recreational or commercial vessels. In addition to considering the information provided in the application under the requirements described in Section 2.1, EPA also considers the costs associated with use of pumpout facilities when determining whether the facilities are reasonably available. Costs applicable to recreational and commercial vessels operating within a waterbody may differ. If so, EPA may evaluate the availability of facilities for recreational and commercial vessels separately.

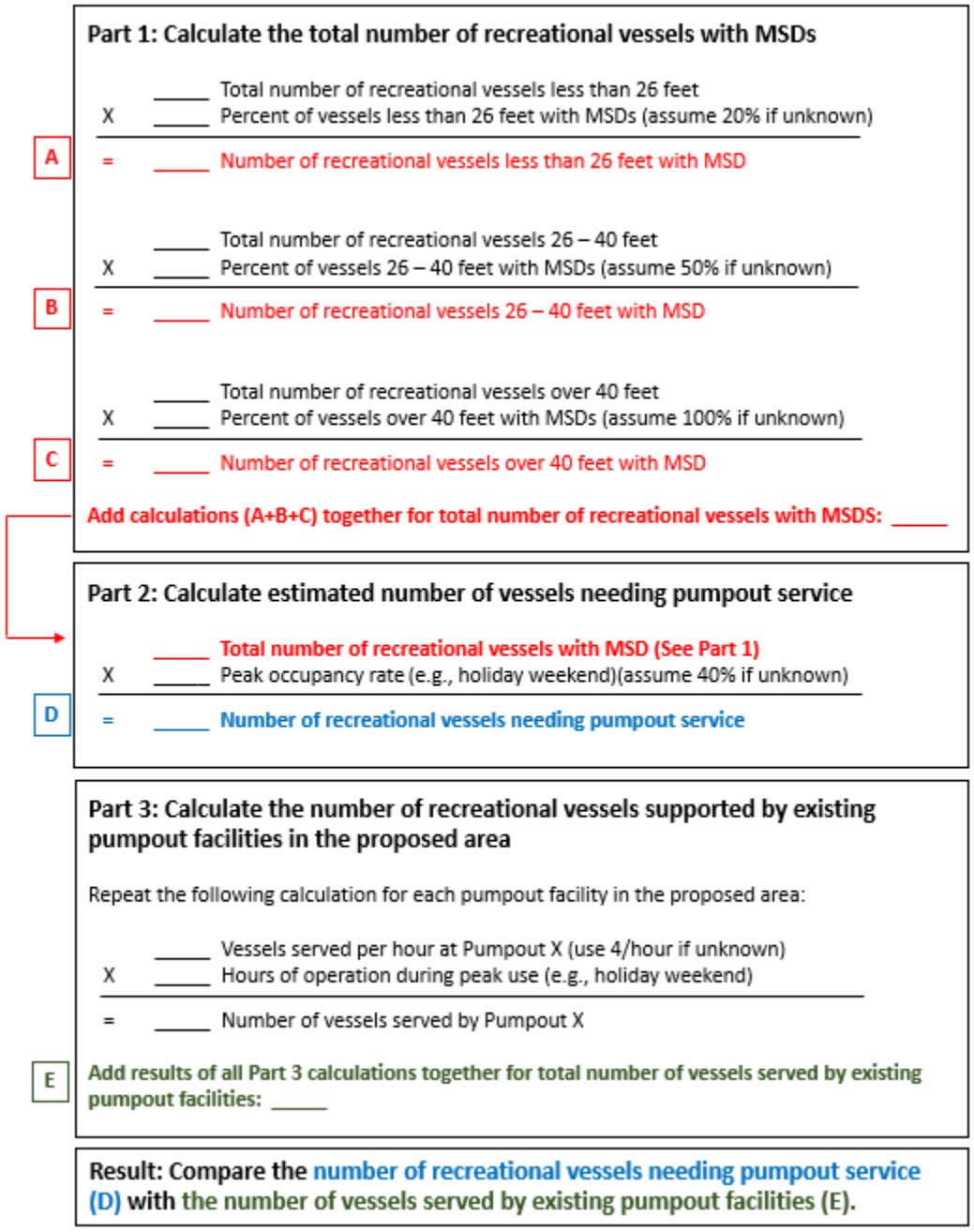
EPA's determination will be issued in the *Federal Register* and will contain an explanation of EPA's decision-making regarding cost and the other factors identified in the "EPA's Evaluation Process" graphic.

2.2.1 Recreational Vessels

Though the size and nature of recreational vessel populations vary across waterbodies, recreational vessels with toilets installed onboard tend to be more uniform in size and volume of sewage production than their commercial counterparts. Therefore, recreational vessel needs for access and use of pumpout facilities are generally consistent. EPA evaluates the adequacy of pumpout facilities for recreational vessels by reviewing the information provided in the application, some of which can be entered into the Recreational Vessel Worksheet described on the following pages. The worksheet estimates the number of recreational vessels that would require access to pumpout facilities during a period of peak usage, such as a holiday weekend, when a large percentage of recreational boaters might be expected on the water ("peak occupancy"). The worksheet also estimates the number of vessels that available pumpout facilities can service during peak usage. For example, if peak usage is on Saturdays and Sundays and Pumpout #1 is open for service between 9:00am and 5:00pm each day, the value entered would be 16 (i.e., eight hours each for two days). Comparing these values provides insight into whether there are adequate pumpout facilities for recreational vessels in the proposed area.

While the worksheet provides default values for instances where exact values are not known, the use of local data is preferred. The state should provide waterbody-specific information for EPA's use in the worksheet whenever possible. Alternatively, the state may wish to fill out the worksheet itself as part of the application submitted to EPA.

Figure 2: Recreational Vessel Worksheet



2.2.2 Commercial Vessels

The size and nature of the commercial vessel population can vary significantly across waterbodies compared to recreational vessels, ranging from large cruise ships to small tugboats. As such, EPA's approach for determining pumpout facility adequacy for commercial vessels is likely to vary for different applications. In certain waterbodies, a similar approach to evaluating the adequacy of facilities for recreational vessels may be employed, comparing the number of commercial vessels to the number of

available pumpout facilities. Applying a recreational vessel approach for commercial vessel assessments may be appropriate if there is a limited number of commercial vessels and it is clear to EPA which pumpout facilities these vessels can access. However, in waterbodies supporting a diverse and large commercial vessel population, EPA may elect to supplement its evaluation by using the Tool to more accurately compare the volume of sewage being produced with the volume of sewage that can be removed by existing pumpout facilities. The output of the screening analysis in the Tool is intended to provide a more complete and accurate picture of adequacy of facilities for commercial vessels. Then, the screening analysis feeds into the rest of the Tool, which assists EPA in factoring cost considerations into the determination of whether adequate pumpout facilities are reasonably available. EPA anticipates minimal facility use costs for the recreational vessel population in any given waterbody. However, EPA would incorporate recreational vessels into the Tool when circumstances indicate that consideration of costs to recreational vessels is needed.

EPA's approach to assessing cost in the context of commercial pumpout facilities consists of two main steps, as shown in Figure 3, below. First, EPA assesses the adequacy of existing pumpout facilities relative to the vessel demand for pumpout facilities to determine whether adequate pumpout capacity exists, as described in the previous section about determining adequacy of facilities collectively. Next, EPA performs an analysis to determine the extent to which vessel operators would incur increased costs as a result of using pumpout facilities in the no-discharge zone. The cost analysis discussed below focuses on non-oceangoing commercial vessels that generate sewage because commercial vessels operating in localized areas would be the vessels most likely to require use of a pumpout facility as a result of a no-discharge zone designation. Oceangoing vessels that travel beyond three nautical miles seaward from shore are able to discharge untreated sewage into those waters in lieu of using pumpout facilities. EPA notes that oceangoing vessels from flag Administrations[2] that have ratified MARPOL Annex IV may have to comply with additional discharge limitations based on such factors as distance from shore and travel speed. Transient vessels passing through the proposed waters may also be able to forgo use of the head while transiting and may not be equipped with a holding tank or require pumpout facilities. However, EPA will include oceangoing and/or transient vessels in its assessment of cost for applications when the operational characteristics of affected oceangoing vessels warrant inclusion. EPA will also consider whether vessels must adhere to MARPOL Annex IV requirements and how that may influence the demand for pumpout facilities.

[2] Flag Administration means the Government of a State whose flag the ship is entitled to fly. A flag Administration is the authority responsible for enforcing maritime regulations for vessels under its jurisdiction.

Figure 3: Overview of analysis

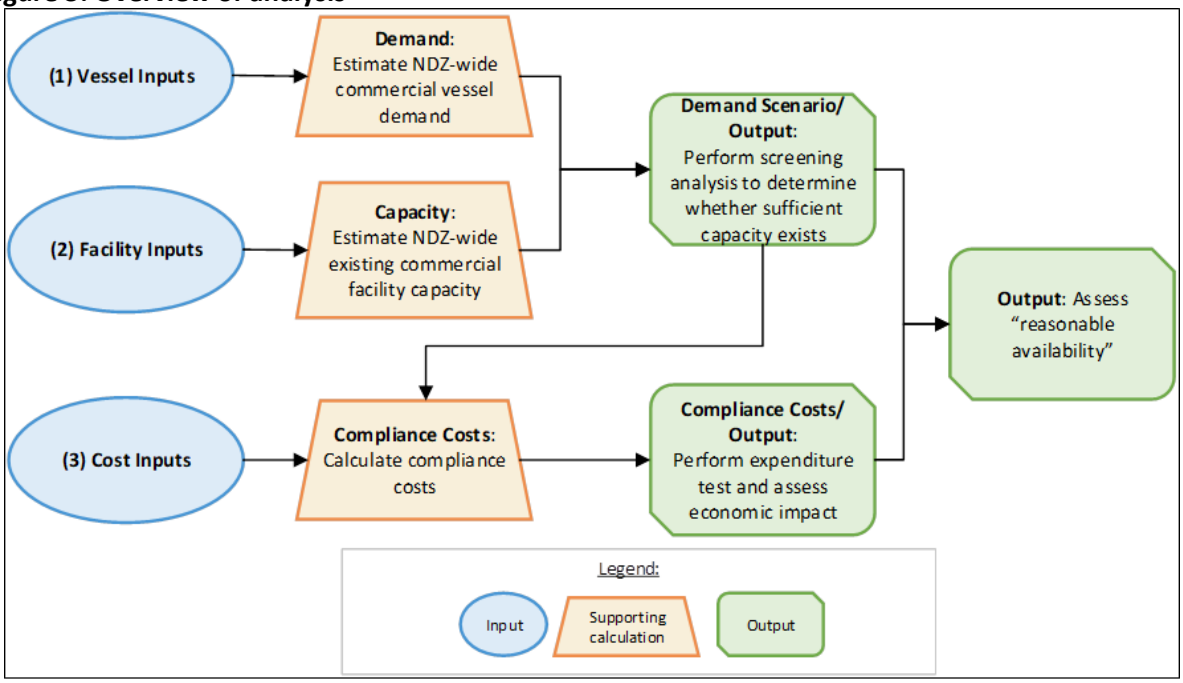


Figure 3 illustrates the process steps carried out in the Tool that was described in the previous section and further explained in Appendix C. The Tool estimates the percent increase in baseline operating costs that different commercial vessel classes are expected to experience as a result of a designation.

The costs that EPA considers are those that can both be attributed to the no-discharge zone designation and vary based on the adequacy of facilities. These include:

- *Facility use costs.* This cost input includes the fee to use a pumpout facility.
- *Pumpout time.* This cost input captures the lost revenue to the vessel due to the time it takes to pumpout.
- *Travel costs.* This optional input will be included in the analysis when vessels must substantially deviate from their typical routes to access pumpout facilities. The travel cost estimate captures the lost revenue and fuel cost to the vessel due to the time and distance to travel to a pumpout facility.
- *Wait time.* This optional input will be included in the analysis when the preliminary screening analysis indicates that the demand for pumpout facilities may exceed the collective facility capacity to receive sewage. The wait time cost estimate captures the lost revenue from waiting to access a pumpout facility.

EPA's cost analysis does not consider costs that cannot be attributed to the no-discharge zone designation or to costs that do not vary based on the adequacy and availability of pumpout facilities.[3]

[3] See Memorandum Opinion, *American Waterways Operators v. EPA*, case no. 18-cv-2933 (APM), February 14, 2022 (holding that the kinds of costs that EPA must consider in its determination of reasonable availability of facilities are those that "bear on the accessibility of the facilities," and "retrofit costs fall outside that category").

For example, the Tool does not incorporate estimates of costs to retrofit a vessel to replace or supplement an existing Type I or Type II MSD with a holding tank on the grounds that the need for retrofits would not be attributable to the availability of pumpout facilities but rather to the existence of the no-discharge zone. As noted earlier, EPA's CWA determination is about the reasonable availability of adequate facilities rather than the reasonableness of a state's establishment of a no-discharge zone. Costs associated with retrofitting would be attributable to the prohibition on discharges itself, rather than to EPA's determination about facility adequacy and availability. Additionally, retrofit costs are "fixed costs" that would not vary based on whether pumpout facilities are adequate and available. While retrofit costs are not considered, the state and EPA must still account for all vessels (not only those already equipped with holding tanks) in identifying the vessel population and determining whether adequate facilities are reasonably available.

While the state may wish to populate the Tool and submit it to EPA along with the written application, EPA does not require use of the Tool by the state. EPA does intend to use information provided in the application to populate the Tool for EPA's review. EPA designed the Tool to be flexible and therefore EPA may adapt its use not only to reflect any information the state provides, but also to incorporate any unique circumstances of a specific waterbody or vessel population. All vessel, facility, and cost inputs to the Tool will be based on these unique circumstances, unless extenuating circumstances prevent the information from being acquired. While EPA would generally defer to the state in matters concerning the state's waters and vessel population, the information provided by the state in the application should be well-supported and verifiable to ensure that EPA can confidently rely on the provided values in lieu of the default values built into the Tool. In circumstances where the origin of provided values is unclear, EPA may consult further with the state. In circumstances where the state does not provide a complete set of values, EPA may consult with the state prior to inputting default values. The source of all default values used in the Tool are provided in Tables C-2, C-3, and C-4 in Appendix C. Additional information is also provided in the "Supporting Calculations" tabs of the Tool, which are also described in greater detail in Appendix C.

For applications that present minimal cost implications, EPA may elect not to use the Tool. In such instances, EPA may provide a narrative description of the costs in the Federal Register Notice issuing the final determination or run a simplified analysis using the Tool.

A walkthrough of the Tool, which is available for download at https://www.epa.gov/vessels-marinas-and-ports/guidance-vessel-sewage-no-discharge-zone-applications, is available in Appendix C. Appendix E contains a list of definitions and sources used in the development of the Tool.

Section 3.0: Applications under CWA Section 312(f)(4)(A)

This section explains the application process for establishing a no-discharge zone under CWA Section 312(f)(4)(A). An (f)(4)(A) designation is appropriate when the state's goal for the designation is to address a compelling need for enhanced environmental protection, but either adequate pumpout infrastructure is not available to support an (f)(3) designation, or the state prefers that EPA establish the designation through federal regulation. As noted elsewhere, this designation type is not intended as a means to avoid the facility requirements identified for (f)(3) applications, since compliance with an (f)(4)(A) designation may not be feasible for affected vessel operators if the waterbody lacks pumpout infrastructure entirely.

To initiate designation of an (f)(4)(A) no-discharge zone, the state must submit an application to EPA indicating that the waterbody requires greater environmental protection. EPA must then evaluate the application to determine whether the quality of the proposed waters requires greater protection than the applicable federal standards provide such that a complete prohibition of sewage discharges from vessels is warranted. If EPA determines that a no-discharge zone may be warranted, EPA then initiates the rulemaking process to designate the no-discharge zone.

During EPA's rulemaking process, EPA would propose the no-discharge zone via rulemaking in the *Federal Register* to solicit public comment. EPA also would consult with affected state and tribal entities to enhance coordination and participation in the process. After carefully considering comments and feedback received, EPA would issue a final rule establishing the no-discharge zone.

The state's application has specific information requirements outlined in 40 CFR 140.4(b), such as the identification of recreational waters, drinking water intakes, and fish-spawning areas. Several of these information requirements align closely with designated uses under the federal Water Quality Standards Regulation (40 CFR Part 131) for implementation of CWA Section 303(c). Water quality standards establish the water quality goals for a specific waterbody, or portion thereof, and consist of designated uses, water quality criteria, and antidegradation requirements. Water quality standards are intended to restore and maintain the integrity of U.S. waters and, where possible, achieve water quality capable of supporting fish, shellfish, wildlife, and recreation. Under CWA Section 303(d), states identify waters that do not meet established water quality standards, so-called "impaired" waters. More information on water quality standards may be found at 40 CFR Part 131 and on EPA's website at https://www.epa.gov/wqs-tech. Throughout the application, the state should explain why the water quality and unique characteristics (e.g., recreational uses, fish habitat) of the proposed waters necessitate greater environmental protection. For more information on vessel sewage discharge impacts, consult Section 1.1. of this guidance.

The state is encouraged to discuss the application with the appropriate EPA Regional office in advance of submission to ensure that the application contains all required information. This section provides guidance on EPA's interpretation of how to fulfill each of the regulatory information requirements in the application, and how to ensure that EPA has the information it needs to evaluate an application. A sample application for a CWA Section 312(f)(4)(A) no-discharge zone is available in Appendix A.

3.1 Development of an Application by the State

EPA's implementing regulations (40 CFR 140.4(b)) list the required components of a state's application for this type of no-discharge zone. An application must contain the required components listed in 40 CFR 140.4(b) to be considered a complete application by EPA. In circumstances where a state submits an application with missing and/or different information from the regulatory requirements, EPA has the discretion to return the application, independently obtain the information, or issue a tentative determination noting any application deficiencies for public comment. This section identifies the information EPA interprets to be required and optional components of each regulatory requirement to assist the state in developing an application.

3.1.1 Application Requirement #1: Waters for Complete Prohibition

> "Such application shall specify with particularly the waters, or portions thereof, for which a complete prohibition is desired." 40 CFR 140.4(b)

Required Information

The application must include a general overview of the proposed no-discharge zone, including both geographic coordinates (latitude and longitude) and a detailed narrative description of the proposed boundaries of the designation. The state must also describe the waterbody, including such information as designated uses, impairments, known water quality data, recreational and commercial interests in the waterbody, and any other relevant information that provides insight into why a complete vessel sewage discharge prohibition is requested.

Optional Information

To clearly delineate the boundaries, a map of the proposed area should be included in the application. The map should include the following information:

- Scale;
- North orientation symbol;
- Locator map (smaller map which places the proposed area into context);
- Delineation of proposed no-discharge zone (i.e., dotted line, shading, coloring, or any other identifying mark);
- Identification of all bodies of water; and
- Identification of relevant and significant cities and towns.

EPA would use this information, along with information provided for the other application requirements, to determine whether greater protection is needed for the proposed waters.

Recommended Information Sources

Water quality information can be obtained from the state's Integrated Reports that combine CWA Section 305(b) water quality assessment reporting with CWA Section 303(d) listing information. These reports provide water quality information and data for major waterways in the state. Designated uses

are identified in a state's water quality standards regulations for each waterbody or segment. More localized data may also be available from the local (county or municipal) water authority, the state's shellfish and beach monitoring programs, and recent fish and shellfish advisories.

3.1.2 Application Requirement #2: Water Recreational Areas

> "The application shall include identification of water recreational areas…" 40 CFR 140.4(b)

Required Information

The application must describe the nature and location of water-based recreational activities occurring in or near the proposed waters. Such activities may include primary contact recreation (e.g., swimming, surfing, snorkeling, water skiing) or secondary contact recreation (e.g., boating, fishing, rowing).

The application must provide a narrative description listing the type of recreational activity, the location within the proposed waters where the activity occurs (either area-wide or localized), and data or statistics on the extent to which the activity is pursued in the proposed waters by the recreating public.

Optional Information

Where useful, a map should be included to depict where recreational waters are located. The state should also describe how vessel sewage discharges are negatively affecting these activities (e.g., beach closures).

The state should also provide information on local socioeconomic benefits derived from the recreational water activities within the proposed waters. In instances where the state anticipates new or expanded access to water recreation as a result of a no-discharge zone designation, the change should be described to the extent possible.

3.1.3 Application Requirement #3: Drinking Water Intakes

> "The application shall include identification of…drinking water intakes..." 40 CFR 140.4(b)

For this designation type, the presence of drinking water intakes may be one of several factors influencing the state's decision to pursue a no-discharge zone for the proposed waters. As noted in Section 1.3, if a goal of the no-discharge zone is to protect drinking water intakes, the state should consider pursuing a designation under CWA Section 312(f)(4)(B). Whereas the size of the no-discharge zone for an (f)(4)(B) designation is likely defined by the waters from which the intakes draw, the size of an (f)(4)(A) designation will vary not only based on the intakes but the other relevant factors discussed in Section 3.0, such as recreational waters and aquatic sanctuaries.

Required Information

In addition to identifying recreational waters, the state must provide a narrative description of the location of each drinking water intake as well as the geographic coordinates (latitude and longitude) of each intake in the proposed no-discharge zone.

> The exact location of drinking water intakes is sensitive information not for public dissemination. This information (including detailed narrative description and geographic coordinates) will need to be provided by the state to EPA; however, the information will need to be redacted from any publicly available version of the application. If a map was prepared for Application Requirement #1, the state should not add the location of drinking water intakes. Instead, a standalone map showing the location of intakes should

Optional Information

To the extent possible, the state should also describe:

- The community served by each drinking water intake, including the estimated population served; and
- The average and maximum amount of inflow (gallons per day).

3.1.4 Application Requirement #4: Aquatic Protected Areas

> "The application shall include identification of…aquatic sanctuaries…" 40 CFR 140.4(b)

Required Information

The application must include the location of aquatic protected areas that are contained within, or overlap with, the proposed no-discharge zone. For purposes of fulfilling this requirement, states might identify marine protected areas (MPAs) or any other protected waters, including those that are non-marine or Great Lakes waters.

Optional Information

An MPA is defined by the International Union for Conservation of Nature as "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values." In the United States, there are over 1,200 MPAs covering both marine waters and waters in the Great Lakes. MPAs include national parks, national marine sanctuaries, national wildlife refuges, national monuments, estuarine research reserves, and similarly managed areas by states and tribes.

Because of the diversity of MPAs, the National Marine Protected Areas Center within the National Oceanic and Atmospheric Administration (NOAA) developed a system for characterizing these areas. The system uses the following characteristics to harmonize terminology in describing a given MPA:

- Conservation focus (i.e., natural heritage and/or cultural heritage);

- Level of protection (i.e., uniform multiple-use, zoned multiple-use, zoned multiple-use with no-take area(s), no-take, no impact, or no access);
- Permanence of protection (i.e., permanent, conditional, or temporary);
- Constancy of protection (i.e., year-round, seasonal, or rotating); and
- Scale of protection (i.e., ecosystem or focal resource(s)).

The application submitted by the state should describe each MPA in the area proposed for designation using the system above and, to the extent possible, identify connections between the MPA(s) and the state's determination that the identified waters warrant a complete prohibition on vessel sewage discharges. For example, an application that includes an MPA with a conservation focus of biodiversity might describe how vessel sewage discharges adversely affects aquatic or marine life in the area. Additionally, the state should determine whether the MPA has an associated economic evaluation study and, if so, provide any pertinent information.

Where relevant, the state should also identify distinctive habitats (e.g., coral reefs, seagrass beds, mangrove forests), as well as endemic and threatened species and their habitats, that are present within the proposed no-discharge zone. Particular emphasis should be placed on habitats or species that may be directly or indirectly impacted by vessel activity and sewage discharges.

Recommended Information Sources

EPA recommends consulting the National Oceanic and Atmospheric Administration's Marine Protected Area Inventory for a comprehensive list of all MPAs in the U.S. The inventory contains interactive maps, downloadable geospatial data, and information on what each MPA does.

3.1.5 Application Requirement #5: Fish-Spawning and Nursery Areas

> "The application shall include identification of…identifiable fish-spawning and nursery areas..." 40 CFR 140.4(b)

Required Information

The state must provide a narrative description of the location of fish-spawning and nursery areas (including shellfish, as appropriate), as well as critical fish migration pathways connecting to these areas. To the extent possible, the state must describe how these areas would benefit from a no-discharge zone designation, including quantifying economic benefits if anticipated (e.g., from greater shellfish production).

Optional Information

If a map was prepared for Application Requirement #1, the state should consider depicting these areas and any migration pathways on that map as well.

Recommended Information Sources

There are several potential sources of information for fish and shellfish critical habitats, such as spawning and nursery areas. First, the most specific information can likely be obtained from the agencies or department responsible for fish and game/wildlife, fisheries management, or health. The agencies may have useful information on the types and locations of fish and shellfish species with life cycle events within the proposed no-discharge zone. At a higher level, the state may consult with the appropriate regional fishery management council, eight of which were established pursuant to the Magnuson-Stevens Fishery Conservation and Management Act. Lastly, the state may query the National Oceanic and Atmospheric Administration's Essential Fish Habitat program, including the program's mapping tool (Essential Fish Habitat Mapper), for location information on federally managed fish species.

3.1.6 Application Requirement #6: Areas of Intensive Boating Activities

> "The application shall include identification of…areas of intensive boating activities." 40 CFR 140.4(b)

Required Information

The application must identify areas within the proposed no-discharge zone where vessels tend to congregate or operate in high density.

Optional Information

To the extent possible, the application should also include:

- The total number of recreational and commercial vessels that use the proposed area, including both regular users (vessels originating within the proposed area) and transient users (vessels originating outside, but traveling through, the proposed area);
- A breakdown of the number of commercial vessels by class (e.g., tugboats, cruise ships, ferries);
- An estimation of the number of vessels operating Type I or Type II MSDs;
- An estimation of the volume of sewage being discharged into the proposed no-discharge zone, and, when available, an estimation of the amount of pollutants being introduced by vessel sewage; and
- Information on existing vessel sewage handling practices within the waterbody.

Additionally, states should provide the locations of any waterfront facilities or other boating access points in the proposed no-discharge zone. If a map was developed for Application Requirement #1, the state should include the locations of waterfront facilities and boating access points on the map. The proximity of boating access points may be representative of the extent of boating activity within the proposed no-discharge zone. States should also include the location of any pumpout facilities in or near the proposed no-discharge zone to help inform boaters of where sewage may be disposed.

The information listed above would assist EPA in understanding the extent and type of vessel usage of the proposed waters.

Recommended Information Sources

Section 2.1.7 contains a list of sources that the state can consult for determining vessel population and usage of a waterbody. Section 2.2 contains the "Recreational Vessel Worksheet" which, though not required, may help the state estimate peak usage and determine whether additional pumpout infrastructure may be needed.

3.2 EPA Consideration of Costs and Benefits

When determining whether to establish a CWA Section 312(f)(4)(A) no-discharge zone, EPA considers the costs and benefits of a designation. For this designation type, the costs imposed on the regulated community may include upfront costs to retrofit vessels, as well as ongoing costs associated with the use of pumpout facilities and operation and maintenance. In this context, retrofitting means that vessel operators may need to either replace existing flowthrough treatment systems (Type I and Type II MSDs) with holding tanks (Type III MSDs) or expand existing holding capacity to prevent the discharge of both treated and untreated sewage. As such, retrofit costs include the purchase cost of the new device, installation costs, and, in some instances, costs for time out of service for the vessel. In the application, the state must provide information or estimates on these expected costs.

In addition to expected costs, the state's application must also describe the anticipated environmental and socioeconomic benefits from designation of a CWA Section 312(f)(4)(A) no-discharge zone. The following are examples of benefits that the state may include:

- Improved water quality;
- Decreased wastewater treatment costs;
- Increased recreational opportunities and associated economic outcomes; and
- Improved status of shellfish beds and/or fisheries and associated economic outcomes.

The list above is not all-inclusive, and states should describe any relevant expected benefits, quantifying economic benefits when possible.

Lastly, the state's application should include a description of the type and number of small entities that will be financially impacted by the no-discharge zone and the extent of those impacts. Sufficient information should be provided to allow EPA to determine, per the Regulatory Flexibility Act, whether the establishment of a no-discharge zone will have a significant economic impact on a substantial number of small entities. For more information on EPA's rulemaking responsibilities under the Regulatory Flexibility Act, visit EPA's website at https://www.epa.gov/reg-flex.

Section 4.0: Applications under CWA Section 312(f)(4)(B)

This section explains the application process for establishing a no-discharge zone under CWA Section 312(f)(4)(B). An (f)(4)(B) designation is appropriate when a state's goal for the designation is to protect a drinking water intake.

To request an (f)(4)(B) designation, the state may apply to EPA to establish a no-discharge zone around a drinking water intake through a federal regulation that prohibits the discharge of any vessel sewage within the drinking water intake zone. EPA regulations (40 CFR 140.4(c)) dictate what a state must submit in the application. After a complete application has been received and reviewed, EPA determines whether to proceed with a federal rulemaking to establish a drinking water intake no-discharge zone. EPA would propose the no-discharge zone in the *Federal Register* to solicit public comment. EPA also would consult with affected state and tribal entities to enhance coordination and participation in the process. After careful consideration of comments and feedback received, EPA may proceed with issuing a final rule establishing the drinking water intake no-discharge zone.

When developing an application, it may be helpful for a state to consult internally with its source water protection program responsible for protecting and improving drinking water source water quality. Internal consultation is likely to provide helpful background information on the waterbody and other pollutants adversely affecting the drinking water source water quality. While each state or local program varies based on state and local arrangements, the following are typical components of a source water protection program that may be relevant to a CWA Section 312(f)(4)(B) no-discharge zone:

- Delineation of the source water protection area, the area to be assessed and protected as it contributes to the water supply to the drinking water intakes. The method used to delineate the source water protection area is likely to vary state-by-state.
- Inventory of contaminant sources in the source water protection area.
- Determination of the susceptibility of a drinking water system to identified source water threats.
- Protection practices to prevent contamination of surface water.

Typically, restrictions on vessel sewage discharges are not anticipated by source water protection programs. The framework and technical resources associated with source water protection programs, however, may assist states in evaluating the contaminants associated with vessel sewage and the resulting adverse impact to drinking water intakes. EPA provides additional guidance on these components, along with relevant tools and resources at https://www.epa.gov/sourcewaterprotection/assess-plan-and-protect-source-water. Additionally, EPA's source water protection program has developed recommendations for engaging the public on protecting source water. One such tool is a "Source Water Collaborative" convened at the local, regional, or watershed level. Source Water Collaboratives work to engage stakeholders and coordinate resources and action. If there is already a Source Water Collaborative in the area or region proposed for protection by a vessel sewage no-discharge zone, the group may be helpful during application development.

EPA encourages any state considering an application for a drinking water intake no-discharge zone to discuss the application with the appropriate EPA Regional office in advance of submission to ensure that

the application contains all required information. EPA's interpretation of each of the application requirements is described below in more detail to assist states in developing an application and to ensure states provide EPA with the information the Agency needs to effectively evaluate applications. The final subsection describes the type of costs and benefits that EPA is likely to consider when deciding whether to designate the proposed no-discharge zone to protect drinking water supply intakes.

4.1 Development of an Application by the State

EPA's implementing regulations (40 CFR 140.4(c)) list the required components of a state's application for a drinking water intake no-discharge zone. An application must contain the required components to be considered a complete application by EPA. In circumstances where a state submits an application with missing and/or different information from the regulatory requirements, EPA has the discretion to return the application, independently obtain the information, or issue a tentative determination noting any application deficiencies for public comment. This section walks through the required and optional components of each 40 CFR 140.4(c) requirement to assist the state in developing an application.

4.1.1 Application Requirement #1: Description of Drinking Water Supply Intakes and Community Served

> "Identify and describe exactly and in detail the location of the drinking water supply intake(s) and the community served by the intake(s), including average and maximum expected amounts of inflow." 40 CFR 140.4(c)(1)(i)

Required Information

The state's application must identify and describe the drinking water supply intake(s) to be protected by the proposed no-discharge zone. To fulfill this requirement, the description must include the geographic coordinates (latitude and longitude) of the intake location(s) along with a narrative description of the waterbody in which each intake is located. Any information that describes the exact location of intake(s) must be redacted from publicly available versions of the application.

> The exact location of drinking water intakes is sensitive information not for public dissemination. As such, this information (including detailed narrative description and geographic coordinates) will need to be provided by the state to EPA; however, the information will need to be redacted from any publicly available version of the application.

Additionally, the state must describe the community served by each drinking water supply intake, including the estimated population served. Lastly, the average and expected maximum amount of inflow must be reported, in gallons per day (or other units as appropriate) for each intake.

4.1.2 Application Requirement #2: Description of Waters Proposed for Protection

> "Specify and describe exactly and in detail, the waters, or portions thereof, for which a complete prohibition is desired, and where appropriate, average, maximum and low flows in million gallons per day (MGD) or the metric equivalent." 40 CFR 140.4(c)(1)(ii)

Required Information

The application must include an overview of the proposed no-discharge zone, including a detailed narrative description of the proposed boundaries and the corresponding geographic coordinates (latitude and longitude). Any relevant metrics available for the waterbody, including average, maximum, and minimum flows must be included when available.

Recommended Information Sources

The U.S. Geological Survey (USGS) National Water Information System is a portal that contains national water data, including stream levels, stream flow, and reservoir and lake levels. USGS collects this data through automatic recorders and manual field measurements at installations across the country. If there is a site in the proposed no-discharge zone, the USGS surface-water data may be useful to include. USGS data can be accessed at https://waterdata.usgs.gov/nwis/sw.

4.1.3 Application Requirement #3: Map of Proposed Drinking Water Intake Zone

> "Include a map, either a USGS topographic quadrant map or a NOAA nautical chart, as applicable, clearly marking by latitude and longitude the waters or portions thereof to be designated a drinking water intake zone." 40 CFR 140.4(c)(1)(iii)

Required Information

States must include a map with the exact geographic coordinates (latitude and longitude) of the proposed no-discharge zone boundaries.

The map must include the following information:

- Scale;
- North orientation symbol;
- Locator map (smaller map which places the proposed area into context);
- Delineation of proposed no-discharge zone (i.e., dotted line, shading, coloring, or any other identifying mark);
- Identification of all bodies of water; and
- Identification of relevant and significant cities and towns.

Per 40 CFR 140.4(c)(1)(iii), states must use a USGS topographic quadrant map or a NOAA nautical chart.

Recommended Information Sources

The current USGS topographic map series is called US Topo and is modeled on 7.5-minute quadrangles (1:24,000 scale). Though the USGS does not map the entire coastal zone, the maps may be suitable for inland waters. USGS maps are available online through the USGS National Geospatial Program at https://www.usgs.gov/core-science-systems/national-geospatial-program/topographic-maps. Maps may be downloaded in a variety of formats to suit the state's needs. NOAA nautical charts map U.S. coastlines and coastal waters and are available at different scales. NOAA's nautical charts can be accessed at https://nauticalcharts.noaa.gov/.

4.1.4 Application Requirement #4: Justification of Size of Proposed Drinking Water Intake Zone

> "Include a statement of basis justifying the size of the requested drinking water intake zone, for example, identifying areas of intensive boating activities." 40 CFR 140.4(c)(1)(iv)

Required Information

The application must contain a justification of the size of the proposed vessel sewage no-discharge zone to be established around the drinking water intake(s).

Optional Information

When justifying the size of the no-discharge zone, the state should explain the likely adverse impact that vessel sewage discharges have on water quality in the proposed area. The regulations provide the state with flexibility in the justification statement, but the state may consider focusing the justification on:

- Boating activity surrounding the intake(s);
- Water quality impacts from boating and expected improvements from a complete prohibition on vessel sewage discharges surrounding the intake(s);
- Modeling, dye studies, or other methods for identifying the area negatively impacted by vessel sewage; and,
- How a no-discharge zone complements other ongoing source water protection activities.

More information on these topics is provided below. Where possible, the state applicant should also estimate the economic benefits (quantifiable and unquantifiable) from expected water quality improvements from establishing a no-discharge zone of a particular size, such as lower costs for the drinking water treatment system or control of waterborne pathogens that evade local drinking water treatment technology.

Boating Activity

The application should describe the extent of boating activity in the proposed no-discharge zone. To the extent possible, description of boating activity should include:

- The number of recreational and commercial vessels operating in the area, including resident and transient vessels;
- Identification of areas where vessels tend to congregate or operate in high density;
- The number or percentage of vessels currently operating Type I or Type II MSDs; and,
- The volume of sewage currently discharged into the proposed no-discharge zone and, when available, an estimate of the amount of pollutants introduced by vessel sewage.

Additionally, states should identify the locations of any waterfront facilities or other boating access points in the proposed no-discharge zone. The proximity of boating access points may be representative of the extent of boating activity within the proposed no-discharge zone.

Section 2.1.7 contains sources that can be used to estimate vessel populations and usage in a waterbody. Section 2.2 contains the "Recreational Vessel Worksheet" which, though not required, may help the state estimate peak usage and determine whether additional pumpout infrastructure may be needed.

Water Quality Impacts and Expected Improvements

Ambient water quality data may be available to identify waters around a drinking water intake that are negatively affected by boating activity or other pollution sources. A state could use ambient water quality data to justify the size of a no-discharge zone. When possible, the application should explain how vessel sewage discharges contribute to poor water quality and what improvements are expected from a no-discharge zone designation for the drinking water intake area.

Modeling and Dye Studies

The application should include the results of any modeling studies on water flow or movement of pollutants within the waterbody and/or dye studies on vessel discharges that may demonstrate the need for a designation of a particular size. Dye studies are useful tools to analyze the dilution and dispersion of a discharge in a particular waterbody and may be used to inform whether and/or how vessel sewage discharges may be impacting the source water used by drinking water intakes. Similarly, models of the waterbody that consider the dispersion of pollutants or water movement could be used to describe the geographic impact of a vessel sewage discharge at a particular location or distance from the intake, taking into account the quantity of vessel discharges.

Source Water Protection Activities

Establishment of a no-discharge zone may complement other efforts undertaken by the state to protect the source water for the drinking water intake(s) from contamination or degradation. If these other efforts are relevant to the size of the requested no-discharge zone, the state should explain the connection.

4.2 EPA Consideration of Costs and Benefits

When determining whether to establish a CWA Section 312(f)(4)(B) no-discharge zone around one or more drinking water intakes through federal regulation, EPA considers the costs and benefits associated with the designation.

The direct and indirect costs of a drinking water intake no-discharge zone designation would stem primarily from the use of pumpout facilities and the need to retrofit vessels by either replacing existing flowthrough treatment systems (Type I and Type II MSDs) with holding tanks (Type III MSDs) or expanding existing holding capacity. EPA may consider the number of vessels that would need to install or expand holding capacity and the cost associated with acquisition and installation of necessary holding capacity. There may be additional costs associated with the operation and maintenance of the new system; however, EPA does not anticipate that the costs substantially differ from flowthrough treatment systems. Additionally, EPA does not expect that the designation of the no-discharge zone would create an increased cost or burden for enforcement officials. Where possible, the state should provide information on expected incremental cost increases associated with a designation.

In addition to expected costs, the state's application should also describe any anticipated environmental, health, and socioeconomic benefits from designation of a CWA Section 312(f)(4)(B) no-discharge zone, such as improved water quality and decreased water treatment costs. States should describe these and other benefits as appropriate in detail.

Lastly, the state's application should include a description of the type and number of small entities that will be financially impacted by the no-discharge zone and the extent of those impacts. Sufficient information should be provided to allow EPA to determine, per the Regulatory Flexibility Act, whether the establishment of a no-discharge zone will have a significant economic impact on a substantial number of small entities. For more information on EPA's rulemaking responsibilities under the Regulatory Flexibility Act, visit EPA's website at https://www.epa.gov/reg-flex.

Section 5.0: For More Information

A no-discharge zone designation can be a useful tool in a state's comprehensive strategy to manage state waters and increase protection against sources of pollution, including vessels, that contribute to water quality degradation. Waterbodies with poor circulation and flushing where vessels congregate may be particularly vulnerable to localized degradation. During the planning and development of an application, EPA encourages the state to coordinate with its EPA Regional office for support. For more information on EPA's vessel sewage regulations, including a list of EPA Regional contacts and a list of previously designated no-discharge zones, visit EPA's website at https://www.epa.gov/vessels-marinas-and-ports/vessel-sewage-discharges.

Section 6.0: References

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Appendix A: Sample No-Discharge Zone Applications

This appendix provides examples of no-discharge zone applications under CWA Section 312(f) that states can use as a model when developing applications. The information contained in these applications is fictitious and used only for demonstration.

As a reminder, the exact location of drinking water intakes is sensitive information not for public dissemination. As such, this information (including detailed narrative description and geographic coordinates) will need to be provided by the state to EPA; however, the information will need to be redacted from any publicly available version of the application.

Section 312(f)(3) Sample Application

Application to Designate the Bayside Channel as a Vessel Sewage No-Discharge Zone (Clean Water Act Section 312(f)(3))

Contents

1.0 Greater Protection and Enhancement Certification

The Bayside Channel area is located directly north of the City of Bayside. It is approximately 25 miles long and varies in width from 5 to 10 miles. Bayside Channel and its tributaries (Long River, Surf Bay, Tidal Bay, and Island Bay) discharge to the Atlantic Ocean. The extent of the proposed no-discharge zone is shown in Figure 1, below. The proposed waters include those inland from two boundary lines drawn north and south from Bayside Island. North of the island, a line drawn from Bayside Lighthouse south to the northernmost point of Bayside Island encloses the proposed waters. In the southern extent, the boundary line is drawn from the easternmost point of the notch on Bayside Island's south end, south/southwest to close off the mouth of the channel from the Atlantic Ocean.

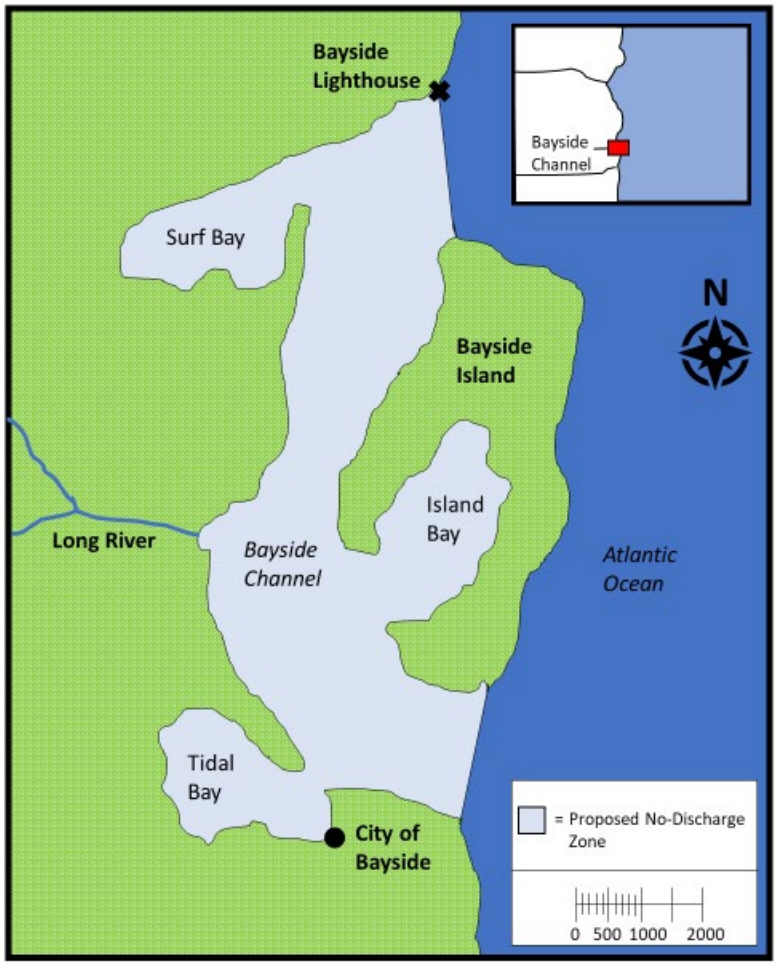


Figure 1. Map of proposed no-discharge zone waters.

The surface waters associated with the Bayside Channel and its tributaries are important economic and recreational resources. Specifically, the Channel and associated tributaries are used in shellfish propagation or harvesting. Shellfish harvesting accounts for 200 total full-time jobs during the spring and summer months (State Sea Grant Study). Shellfish growing areas are located on the east side of the Channel, in Surf Bay. There are twelve commercial shellfish harvest boats that operate in Bayside Channel. In addition, the Bayside Channel includes approximately 1,000 acres of public and private beaches which are used for recreational activities that account for 35,000 visitor-days during the spring and summer months (State Comprehensive Outdoor Recreation Plan).

The only existing point source of water pollution within or directly adjacent to the proposed no-discharge zone is the Bayside Municipal Sewage Treatment Plant, which is located 8 miles up Long River from Bayside Channel. The discharges from this plant are continually monitored and regularly meet or exceed local, state, and federal water quality standards.

Over the past 10 years, recreational boating in the Channel has increased significantly. As indicated in Table 1, fecal coliform levels in the Bayside Channel have increased during the summer months when recreational vessels are on the Channel in great numbers. Sewage discharges from recreational vessels contribute to fecal coliform pollution, degrading water quality. Due to these conditions, the surface waters are currently patrolled during the summer months to control discharges of sewage from recreational vessels. Since 2017, several beaches and over 1,500 acres of shellfish harvesting areas have been closed due to high levels of fecal coliform. Therefore, greater protection of the surface water is required than the applicable federal standards to improve the poor water quality and protect public resources, including beaches and shellfish harvest areas, that are threatened by vessel sewage pollution.

Table 1. Fecal coliform (CFU per 100 mL) measurements in Bayside Channel.

Monitoring Site	3/17	6/18	8/18	4/18	6/18	8/18
Island Bay Dock	110	860	840	*NIA*	640	670
Long River	30	320	420	60	510	480
Tidal Bay Marina	40	120	320	*NIA*	400	320
Surf Bay Marina	100	400	440	50	320	420

Source: "Ocean State 305(b) Water Quality Assessment Report,"
Ocean State Environmental Protection Agency, Division of Water, 2019, pp. 211-215.

For the protection and enhancement of waters used by the general public (for various commercial and recreational marine activities), shellfish resources, and other marine life and habitat, it is requested that a no-discharge zone be approved for the coastal waters in the City of Bayside in Ocean County under Clean Water Act section 312(f)(3).

2.0 Pumpout Facility Information

There are five waterfront facilities (e.g., docks, harbors, marinas) that operate pumpout facilities in the proposed Bayside Channel no-discharge zone. All five facilities are accessible to the public. The following map shows the geographic location of the pumpout facilities within the proposed Bayside Channel no-discharge zone. The five pumpout facilities are labeled on the map as P1-P5.

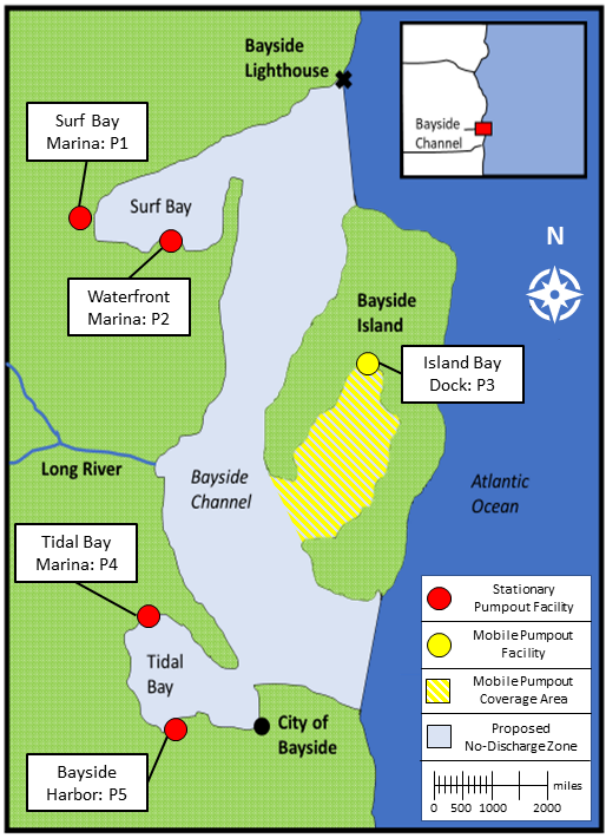


Figure 2. Map of pumpout facilities in Bayside Channel.

A more specific description of the location and type of each pumpout facility is provided below. Sources include "Ocean County Boater's Guide" (Ocean County Division of Tourism, 2010) and personal communication with owners/operators of Surf Bay Marina, Waterfront Marina, Island Bay Dock, Tidal Bay Marina, and Bayside Harbor. During phone and email conversations in March of this year with facility owners/operators, the state gathered and validated the pumpout facility information contained in this application. Copies of emails and notes from phone conversations are available upon request.

Surf Bay Marina. This marina is located at the west end of Surf Bay about 0.75 miles from the bay entrance off the northern end of the Bayside Channel. The marina currently operates one stationary, marina-wide pumpout facility, which is located directly to the right of the fuel dock at the end of the middle pier. The pumpout facility also accommodates sewage from portable toilets.

Waterfront Marina. This marina is located near Surf Bay Marina (approximately 0.5 miles). The Waterfront Marina is closer to the bay entrance off the Bayside Channel than the Surf Bay

Marina. It operates a portable pumpout cart that can be moved to different areas of the marina to service vessels.

Island Bay Dock. This dock is in the northwest portion of Island Bay, approximately 0.5 miles off the southern part of the Bayside Channel. Island Bay Dock is the only facility located on the ocean-side of the Bayside Channel. Island Bay is a popular location for vessels to moor, so the Island Bay Dock has operated a mobile pumpout boat for the past 5 years which services vessels in Island Bay. The pumpout boat operated by Island Bay Dock offers pump out services to vessels operating throughout Island Bay out to the mouth of the Bay (drawing a line from the northern spit to the southern spit). Services may be scheduled ahead of time, or on an on-call basis, by calling the office at (123) 555-1300. Emergency services outside of operating hours are also available but will incur an additional fee of $100 per hour. For on-call services, response times average 30 minutes to 1 hour on weekdays, and 1 to 3 hours on weekends. The pump out boat's holding tank has a capacity of 600 gallons.

Tidal Bay Marina. This marina is located at the northern end of Tidal Bay, approximately 0.5 miles from the bay entrance from the southern part of the Bayside Channel. Tidal Bay Marina operates one stationary, marina-wide pumpout facility which is located at the end of the fuel dock. The pumpout facility is also a reception facility for portable toilet waste.

Bayside Harbor. As shown in Map 1, Bayside Harbor is located directly 0.5 miles south of the Tidal Bay Marina in Tidal Bay. This harbor operates one stationary pumpout station.

Table 2 below provides the names and addresses for the five facilities described above. For reference, the codes assigned to each facility on the map in Figure 2 are presented next to each facility. The table also provides information on hours of operation, number of pumpout facilities by type (e.g., stationary, cart, boat, barge), fee (per use or per gallon), and the operating capacity of the facility (in gallons per minute). The physical accessibility of vessels to each pumpout facility is also captured in the table, including the mean low water depth adjacent to each facility, the maximum draft of vessels that can use each facility, and the estimated percentage of vessels precluded from using each facility based on draft limitations. It is estimated that 5 percent of recreational vessels with installed toilets using the Bayside Channel area have a draft of more than 6 feet; these vessels would be excluded from accessing the facility at Bayside Harbor but could access all other facilities. The other 95 percent of recreational vessels would not be excluded from accessing any pumpout facilities. The commercial shellfish vessels all have a shallow draft of less than 10 feet. These vessels operate in Surf Bay and can access the two pumpout facilities in their vicinity. There are no bridges in the proposed no-discharge zone, therefore, no maximum height limitations exist.

The information presented in the table is correct as of March 2022 and has been confirmed by facility personnel.

Table 2. Pumpout Facility Information.

Name (Code)	Waterfront Facility Information	Hours of Operation	Mean Low Water Depth	Draft	Vessels Excluded (%)	Number of Pumpout Facilities by Type	Fee (per use or per gallon)	Operating Capacity (gal/min)
Surf Bay Marina (P1)	**123 Bay Road, Bayside, US 01234** William Smith (123) 555-2424 Channel 16 VHF-FM	April – October: M-F: 8 am – 8 pm S & S: 7 am – 10 pm November – March: 10 am – 4 pm daily	15 ft.	10 ft.	0%	Stationary: 1	Customers: Free Others: $5 Commercial vessels: $10	88
Waterfront Marina (P2)	**345 Surf Road, Bayside, US 01234** Ed Johnson (123) 555-2300 Channel 16 VHF-FM	M-F: 8 am – 8 pm Sat: 7 am – 11 pm Sun: 7 am – 10 pm	12 ft.	7 ft.	0%	Cart: 1	Free to public	25
Island Bay Dock (P3)	**12 Island Road, Bayside, US 01266** Joseph Hill (123) 555-1300 Channel 12 VHF-FM	M-F: 10 am – 10 pm Sat: 8 am – 11 pm Sun: 7 am – 10 pm	30 ft.	25 ft.	0%	Boat: 1	Pumpout: $10	25
Tidal Bay Marina (P4)	**25 Tidal Road, Bayside, US 01244** Susan Washington (123) 555-1111 Channel 14 VHF-FM	M-Th: 10 am – 5 pm F & Sat: 7 am – 10 pm Sun: 7 am – 9 pm	13 ft.	8 ft.	0%	Stationary: 1	Customers: Free Others: $8	88
Bayside Harbor (P5)	**55 Tidal Road, Bayside, US 01244** John Morrison (123) 555-2222 Channel 14 VHF-FM	M-F: 10 am – 7 pm Sat: 8 am – 10 pm Sun: 8 am – 9 pm	10 ft.	6 ft.	5%	Stationary: 1	Free to public	88

Sources: Personal communication with owners/operators of Surf Bay Marina, Waterfront Marina, Island Bay Dock, Tidal Bay Marina, and Bayside Harbor.

FACILITY MAINTENANCE

The sewage reception facilities at Surf Bay Marina, Tidal Bay Marina, and Bayside Harbor are self-service. Signs are posted with the proper operating procedures, however, personnel check on the facilities several times a day (especially during periods of heavy use) to prevent major problems (e.g., sewage lines become clogged if not rinsed properly) from occurring. The pumpout facilities are inspected and cleaned once a week and thoroughly checked and repaired once a year (usually during off-peak months).

The mobile pumpout boat service provided through a contract with Island Bay Dock is monitored for maintenance or operational problems on a continuous basis because the owner of the pumpout boat is also the operator. Approximately once a year the mobile pumpout is serviced and repaired.

The portable pumpout cart at Waterfront Marina is operated by marina staff, who are also responsible for emptying the tank when it fills. The cart equipment is inspected and cleaned once a week, and maintenance is scheduled as needed.

FACILITY WASTE TREATMENT METHODS

The stationary pumpout facilities located at Surf Bay Marina, Bayside Harbor, and Tidal Bay Marina are connected to the Bayside Municipal Sewage Treatment Plant, which is located 15 miles from Surf Bay Marina, 7 miles from Tidal Bay Marina, and 9 miles from Bayside Harbor. Bayside Municipal Sewage Treatment Plant has made an agreement with the State Department of Environment Protection (DEP) to accept vessel sewage. Bayside Municipal Sewage Treatment Plant is in compliance with applicable effluent guidelines.

The mobile pumpout station that services the Island Bay dock area retains vessel sewage on board in a 300-gallon holding tank. Once a week, or more often when the tank level is near capacity, the mobile pumpout boat travels to Tidal Bay Marina where a licensed septage hauler meets the boat and pumps out the contents of the holding tank for transport to the Bayside Municipal Sewage Treatment Plant.

Vessel sewage collected at the portable pumpout facilities at Waterfront Marina are emptied directly into the sewer system linked to the Bayside Municipal Sewage Treatment Plant.

3.0 Vessel Population and Usage in Proposed Area

3.1 Recreational Vessels

The waterfront facilities in the Bayside Channel area keep records on the number and size of county registered and transient vessels. Although not all vessels use these five facilities, these numbers combined with registration records for Ocean County should provide an accurate estimate for vessel use in the Bayside Channel area. This area receives a significant level of transient traffic. The number of transient vessels was estimated by the number recorded during the 2019 Labor Day weekend.

Table 3. Recreational Vessel Population in Proposed No-Discharge Zone

Vessel Length	Estimated Number of Registered Vessels	Estimated Number of Transient Vessels	Total Estimated Number of Vessels
Over 40 feet	98	109	207
26 to 40 feet	513	415	928
16 to < 26 feet	2,206	441	2,647
< 16 feet	5,636	587	6,223
Total	8,453	1,552	10,005

Sources: Ocean County recreational vessel registration records and mooring registration records from Surf Bay Marina, Waterfront Marina, Island Bay Dock, Tidal Bay Marina, and Bayside Harbor.

The following worksheet was used to estimate the number of vessels operating an MSD in the proposed no-discharge zone (the assumed percentages of each vessel length class operating an MSD provided by EPA were used). It is assumed that 40% of these vessels would be operating over a peak holiday weekend and would require a pumpout service during this time. The worksheet shows that an estimated 978 vessels would operate an MSD and need to use a pumpout facility during a peak holiday weekend.

There are five pumpout facilities servicing recreational vessels in this area, as described previously. Marina owners were contacted to assist in estimating the number of vessels that each facility can service per hour. Given this and their weekend operating hours, the number of vessels that each pumpout facility can service on a given weekend was calculated. The five pumpout facilities are estimated to be capable of servicing over 1,000 vessels during a weekend. Therefore, the capacity of the five pumpout facilities can service the vessel population even during periods of peak demand.

RECREATIONAL VESSEL WORKSHEET

Part 1: Calculate the total number of recreational vessels with MSDs

	8,870	Total number of recreational vessels less than 26 feet
X	0.20	Percent of vessels less than 26 feet with MSDs (assume 20% if unknown)
=	1,774	Number of recreational vessels less than 26 feet with MSD

A

	928	Total number of recreational vessels 26 – 40 feet
X	0.50	Percent of vessels 26 – 40 feet with MSDs (assume 20% if unknown)
=	464	Number of recreational vessels 26 – 40 feet with MSD

B

	207	Total number of recreational vessels over 40 feet
X	1	Percent of vessels over 40 feet with MSDs (assume 20% if unknown)
=	207	Number of recreational vessels over 40 feet with MSD

C **Add calculations (A+B+C) together for total number of recreational vessels with MSDS: 2,445**

Part 2: Calculate estimated number of vessels needing pumpout service

	2,445	**Total number of recreational vessels with MSD (See Part 1)**
X	0.40	Peak occupancy rate (e.g., holiday weekend)(assume 40% if unknown)
=	978	**Number of recreational vessels needing pumpout service**

D

Part 3: Calculate the number of recreational vessels supported by existing pumpout facilities in the proposed area

Repeat the following calculation for each pumpout facility in the proposed area:

	8	Vessels served per hour at Pumpout 1 (use 4/hour if unknown)
X	30	Hours of operation during peak use (e.g., holiday weekend)
=	240	Number of vessels served by Pumpout 1

	4	Vessels served per hour at Pumpout 2 (use 4/hour if unknown)
X	32	Hours of operation during peak use (e.g., holiday weekend)
=	128	Number of vessels served by Pumpout 2

	10	Vessels served per hour at Pumpout 3 (use 4/hour if unknown)
X	30	Hours of operation during peak use (e.g., holiday weekend)
=	300	Number of vessels served by Pumpout 3

	8	Vessels served per hour at Pumpout 4 (use 4/hour if unknown)
X	29	Hours of operation during peak use (e.g., holiday weekend)
=	232	Number of vessels served by Pumpout 4

	4	Vessels served per hour at Pumpout 5 (use 4/hour if unknown)
X	27	Hours of operation during peak use (e.g., holiday weekend)
=	108	Number of vessels served by Pumpout 5

E **Add results of all Part 3 calculations together for total number of vessels served by existing pumpout facilities: 1,008**

Result: Compare the number of recreational vessels needing pumpout service (D) = 978
with the number of vessels served by existing pumpout facilities (E) = 1,008

3.2 Commercial Vessels

The only commercial vessels that use or transit through the Bayside Channel area are twelve shellfish vessels that operate from Surf Bay Marina.

Vessel Information

There are twelve commercial fishing vessels engaged in shellfish harvesting. They have a three-month operating season, from January to March. They are restricted to harvesting between Monday and Friday. On average, there are eight crew members per vessel. All the commercial vessels currently have a Type III MSD installed.

Pumpout Information

The shellfish vessels operate in Surf Bay and primarily utilize the stationary pumpout located at Surf Bay Marina. The operating hours for this facility are found in Table 2. Commercial vessels pay a higher fee of $10 to use this facility. Because the commercial vessels only operate during the week, there are usually a low number of recreational vessels needing to pump out at this time, so no wait time is expected to access facilities. As noted previously, the stationary pumpout has a direct connection to the sewer system.

Section 312(f)(4)(A) Sample Application

Application to Designate Main Bay, Main Channel, and its Tributaries as a Vessel Sewage No-Discharge Zone (Clean Water Act Section 312(f)(4)(A))

Contents

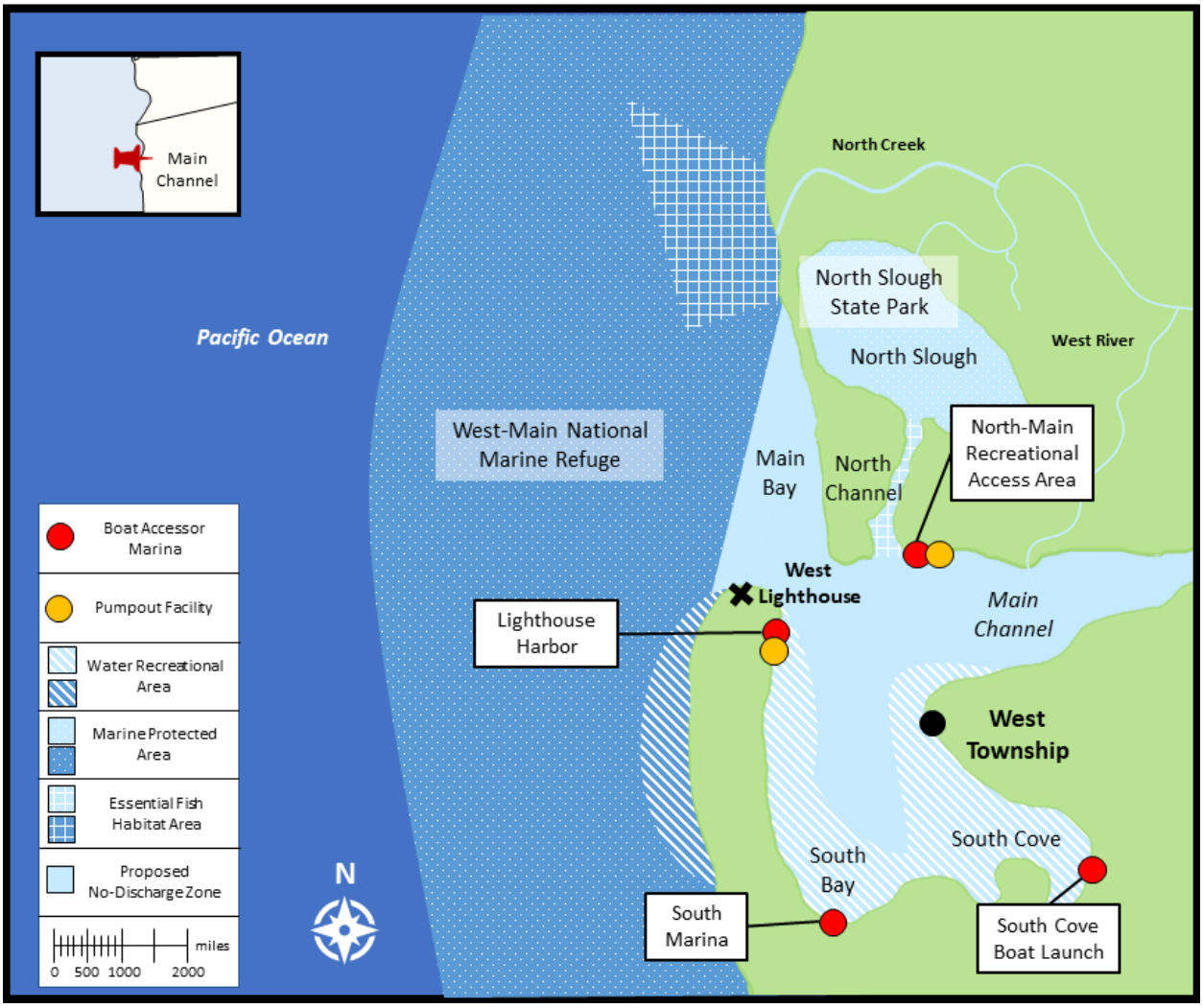


Figure 1. Map of proposed no-discharge zone waters and relevant features for Main Channel.

1.0 Description of Waters for Complete Prohibition

Main Bay (hereafter referred to as the Bay) and Main Channel (hereafter referred to as the Channel) are located around West Township, a community with multiple frequently visited areas for recreation, wildlife, and commerce. The Channel and its tributaries – including the North and South Forks of the West River, South Bay, South Cove, North Channel, and North Slough – empty into the Pacific Ocean. It is approximately 30 miles from the east side end of the Channel to the entrance to Main Bay, varying in width from 15 to 3 miles. The North Slough and North Channel filter some sediments and pollutants coming from upland of the West River, but the South Fork of the River empties directly into the Channel.

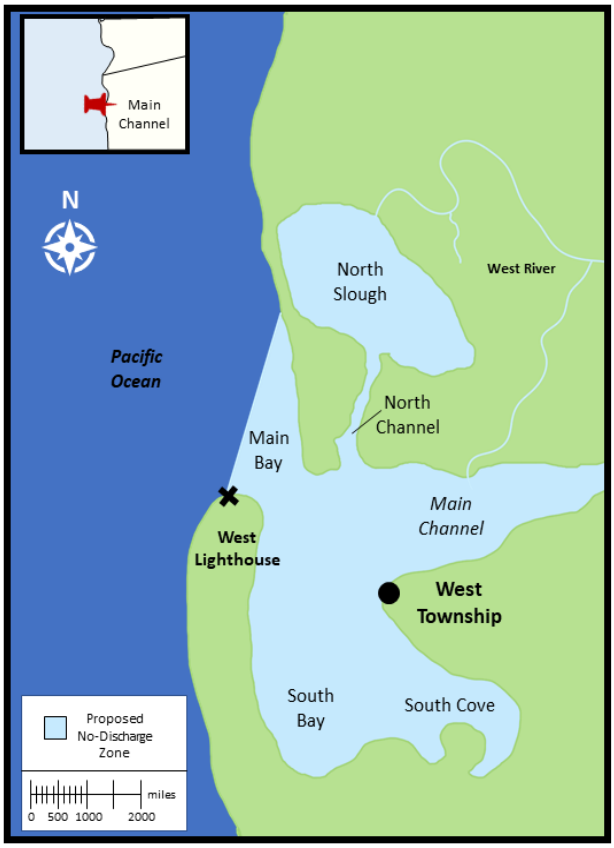


Figure 2. Map of proposed no-discharge zone waters for Main Channel.

The extent of the proposed no-discharge zone is shown in Figure 2, seen right. The proposed waters include those inland from the largest portion of the mouth of Main Bay where it meets the Pacific Ocean, roughly 5 miles wide. On the south end of the boundary, this coincides with the location of the West Lighthouse and on the north end meets a peninsula that contains North Slough and Channel.

The north edge of the Bay lies at 35.8007° N, 122.9473° W, while the south edge lies at 35.4996° N, 122.9479° W. This is the area in which all oceangoing vessels must enter and exit the Bay, making it a high traffic location. These points constitute the northern and southern boundaries of the proposed no-discharge zone as well as the western boundary points. West of those points, ocean currents and mixing more evenly disperses potential pollutants, but tidal Bay fluctuations can keep pollutants mostly within the Bay.

The eastern boundary lies upstream of the Channel at 35.6723° N, 122.09873° W. Tidal variations can extend the salt-fresh water boundary to farther within the freshwater zone, meaning vessel sewage discharge could also reach farther, impairing the Main River and West Rivers that contain commercially and culturally important fish species.

For the protection and enhancement of waters used by the general public (for various commercial and recreational aquatic activities), fishery resources, and other marine life and habitat, it is requested that a no-discharge zone be approved for the coastal waters in West Township in Coastal County under Clean Water Act section 312(f)(4)(A).

2.0 Designated Uses and Protections Needed for Waters

The surface waters associated with the Main Channel and its tributaries are important economic and recreational resources. Specifically, the majority of jobs (77%) in West Township are related to designated uses of the Channel and its tributaries. This includes tourism and ecotourism revenue, as well as commercial fisheries and culturally important species and sites for local Tribes. Additionally, the waters proposed for a no-discharge zone are frequently used by local tribes to harvest numerous fish and shellfish species, as there are both subsistence and non-subsistence use areas.

2.1 Ecosystem Importance

The areas connected, surrounding, or within Main Channel impact each other. Phytoplankton in the North Slough forms the base of a food chain that feeds living shorelines that provide ecosystem services to West Township, including cleaning water and creating structure that prevents coastal erosion. A change to the base of the food chain may change the entire ecosystem reducing the nearly $70 million in natural infrastructure services the ecosystem provides yearly (State Coastal Commission Study). Aquatic sanctuaries and protected fish habitat help maintain these services, which could be negatively impacted by vessel sewage discharges.

2.1.A. Aquatic Sanctuaries

To the West of Main Bay lies West-Main National Marine Refuge. The Marine Refuge covers nearly 200 miles of coastline beginning in the north end at 36.7824° N, 123.3749° W and ending south at 34.9807° N, 121.9473° W. This puts Main Bay and the outflow of Main Channel and its tributaries directly into the marine refuge since it lies almost in the center of the Marine Refuge. This area was established in 1987 and is managed and monitored by the National Marine Fisheries Service.

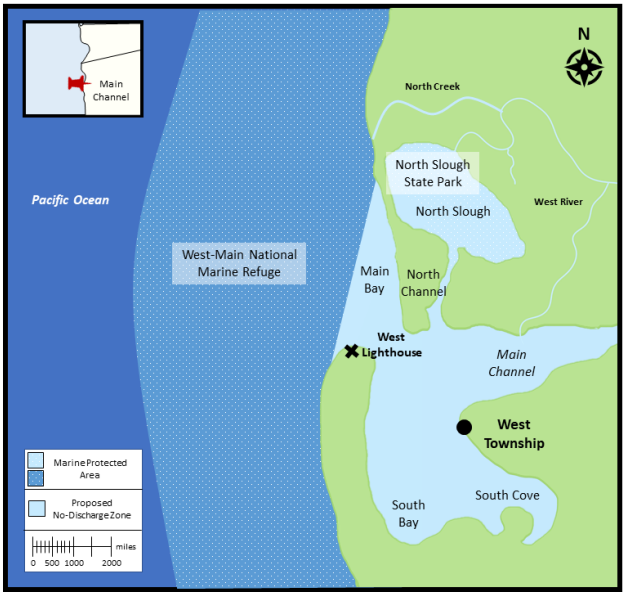


Figure 3. Map of aquatic sanctuaries in or near Main Channel.

The conservation of this area focuses permanently on ecosystem scale protection year-round. Within 3 miles of shore, it is a no-take, no-impact zone due to the fish spawning habitat and connectivity of populations within the boundaries of the refuge to fisheries. Populations within the no-take zone replenish the brood stocks of fisheries that are important for both recreational and commercial fishing. Outside of 3 miles to the edge of the refuge is a multiple-use, no-take zone, made popular for ecotourism with scuba diving expeditions, whale watching tours, and other recreation activities.

Detrimental effects on water quality (indicated by high concentrations of fecal coliforms and nutrients) from vessel sewage discharges in Main Bay have been shown to impact the health of this delicate ecosystem (State Coastal Commission Study). The refuge already has some protection from vessel

discharge but increasing the boundaries of that no-discharge zone to inside the Main Bay and Main Channel could allow for healthier fish populations, which in turn may lead to a healthier economy. In a study conducted by the Coastal Commission for Healthy Economies and the State Sea Grant, decreased pollution within the Bay and Channel could lead to as much as a 30% increase in fishery yields, translated to $30 million for the local economy.

To the north of the Channel is North Slough State Park. It is directly connected to the Channel and Bay by North Channel and is fed into by one of the tributaries of West River, which also feeds to the Main Channel and directly into the ocean via North Creek. It covers 186 acres, and its center is 35.7002° N, 122.8473° W. The State Park was established in 1976 and managed by the State Park Service.

This is an area that is essential for migratory birds (protected by the Migratory Bird Treaty Act) as part of the Pacific Flyway. It is also home to three endemic, endangered plant species and one species of endangered mussel. With multiple important natural and cultural resources, this area is no access, granting it the highest levels of permanent protection, year-round. In 2009, North Slough State Park was also designated as a cultural heritage site, reaffirming the importance of this area. Though not accessed by humans, an evaluation done by the economics department of West University found that the ecosystem services provided by the Slough, between water purification, inland flood protection, and safe breeding grounds for migrating bird and fish species, combine to $220 million in services to the community. Prohibiting vessel sewage discharges in the Channel and Bay would ensure that this environment stays pristine and is not impacted by anthropogenic factors.

2.1.B. Fish-Spawning and Nursery Areas

The West River is one of the main throughways for anadromous and catadromous fish species listed under the Endangered Species Act and others important to commercial fishing operations. Spawning grounds farther upriver, as well as near the output of North Creek into the Pacific Ocean, are essential for the propagation of these species, and the Pacific Ocean output provides important nursery grounds for the juvenile life stage. The other throughway for fish to or from the Pacific Ocean to West River is the North Channel, which provides a wider path, as well as leads to the nursery habitat of North Slough. These areas were established as essential fish habitat by NOAA's Essential Fish Habitat Program in 2009.

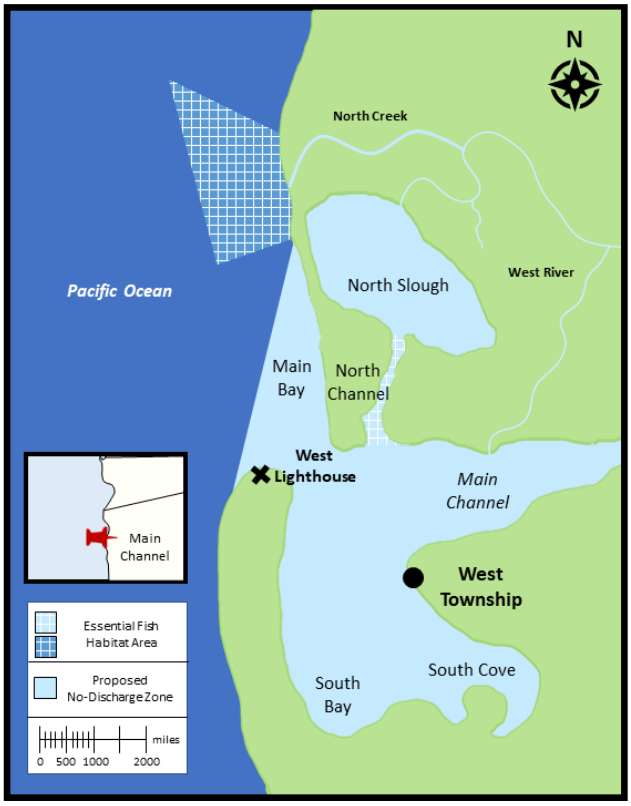


Figure 4. Map of essential fish habitat, including fish-spawning and nursery areas, in or near Main Channel.

Establishment of the no-discharge zone would increase the health of fish populations that do not directly enter North Creek on their way to West River, but those that access it passing through Main Bay and Channel. An independent study conducted jointly by the State Fisheries Management and the National Marine Fisheries Service found that fish exposed to lower levels of fecal contamination grew at faster rates and to larger overall sizes than those exposed to higher levels (Doe, 2019). Females of the species also produced larger brood sizes, thereby likely increasing the fish population overall.

2.2 Human Community Importance

As stated previously in section 2.1., the human community of West Township and the areas surrounding Main Bay and Channel benefit greatly from ecosystem services, cultural heritage, and recreational, commercial, and subsistence fishing of the proposed no-discharge zone. There are also drinking water intakes, recreational areas, and tourism aspects that benefit the community.

2.2.A. Drinking Water Intakes

South Fork West River Intake – 35.7051° N, 122.5473° W

This eastern-most water intake is the major source of water for 75,000 people from West Township and Channel and Bay lining areas. The flow to the intake is 85,000 gallons of water per day on average and 160,000 gallons per day maximum. The maximum occurs seasonally in the spring because the water in West River is mostly from snowmelt from the West Mountains.

North Slough Branch Freshwater Intake – 35.7093° N, 122.5473° W

This intake serves only the 10,000 people on the North Creek Tribe Reservation. It is the northern-most water intake averaging 6,000 gallons per day average and 15,000 gallons per day maximum.

Coastal Desalination Intake – 35.7051° N, 122.5473° W

Figure 5. Map of drinking water intakes around Main Channel.

15,000 people in coastal areas are served by this southwestern-most intake which pulls in a constant rate of 20,000 gallons per day. This community cannot easily obtain the freshwater on the other side of the Channel and is sometimes cut off from outside communities due to mudslides in winter months. The desalination plant was established in 2015 by the West Municipal Water District. West Township is one of several communities working with the District on establishing good desalination practices to accommodate for more frequent drought years. Excess water taken in is used for irrigation or stored for emergency purposes.

2.2.B. Recreational Waters and Socioeconomic Impacts

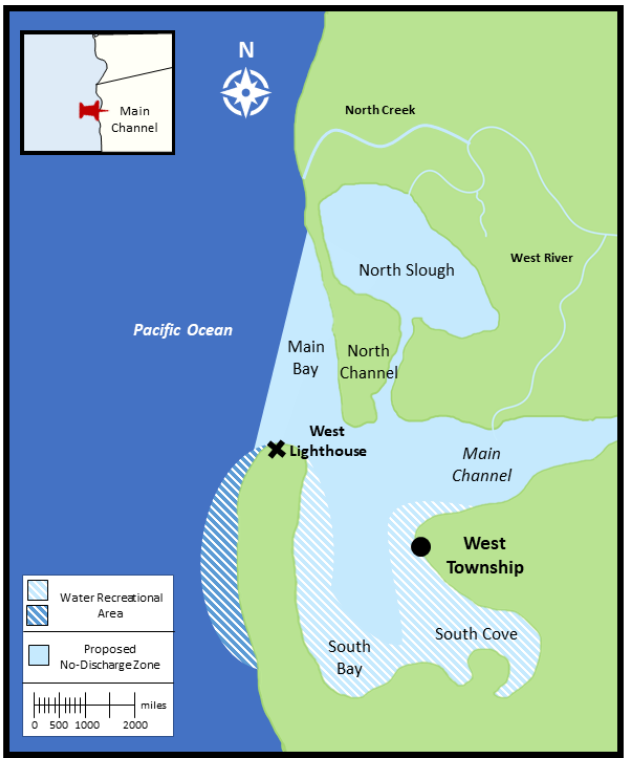


Figure 6. Map of recreational waters in and around Main Channel.

As a popular coastal destination taking in up to 70,000 visitors in summer months and doubling the population of the town, there are recreational waters throughout Main Bay and Main Channel that have both primary and secondary contact recreation along the 90 miles of Bay shoreline (State Comprehensive Outdoor Recreation Plan). Locations from the South Bay up to West Lighthouse serve mostly secondary contact recreation, offering boating, kayaking, and multiple piers for ample fishing area wide, as well as a marina housing multiple restaurants and carnival-style games. Another boating access point with a pumpout facility offers similar activities on the East side of South Cove, with beaches for general recreation on the West corner. There are several beaches along the shore of West Township that are used for sunbathing, beach volleyball, and swimming in designated zones. These beaches have had to be closed eight times in the last two years due to high levels of fecal contamination that occurred during periods of increased boating activity. The Community Council of West Township calculated an overall loss in revenue for the tourism-dependent area of approximately $200 million. During this period, unemployment also increased from 7% to 15% (Township Planning Commission and Council).

To the south, ocean-side of West Lighthouse is another recreation area popular with surfers, swimmers, and sunbathers. The north end has only had one beach closure in the past five years at a high traffic time of the fishing and recreation season, while the southern beaches have had zero. This is a less populated area that receives fewer visitors, and the closures have not meaningfully impacted tourism-dependent businesses in the vicinity.

3.0 Potential Sources of Degradation to Waterbody

The only existing point source of water pollution within or directly adjacent to the proposed no-discharge zone is the West Township Municipal Sewage Treatment Plant, which is located 8 miles up West River from Main Channel. The discharges from this plant are continually monitored and regularly meet or exceed local, state, and federal water quality standards.

Over the past 10 years, recreational boating in the Channel has increased significantly. Fecal coliform levels in the Main Channel have increased during the summer months when recreational vessels are on the Channel in great numbers. Local enforcement authorities currently patrol the Bay during the summer months to ensure compliance with vessel sewage discharge regulations. In the 2017 summer tourism season, over 100 vessels were fined for improper sewage handling practices (State Environmental Enforcement Agency). Therefore, greater protection for these waters is required than the applicable federal standards to improve the poor water quality and protect public resources, including beaches and essential fish habitat, that are threatened by vessel sewage pollution.

3.1. Areas of Intensive Boating Activities

3.1.A. Facilities

There are four waterfront facilities (e.g., docks, harbors, marinas), two of which operate pumpout facilities, in the proposed Main Channel no-discharge zone. All four waterfront facilities are accessible to the public and are shown in Figure 7.

A more specific description of the location and type of each pumpout facility is provided below. Sources include "A Boater's Guide to Main Bay" (West Township Tourism Board, 2012) and personal communication with owners/operators of the waterfront facilities.

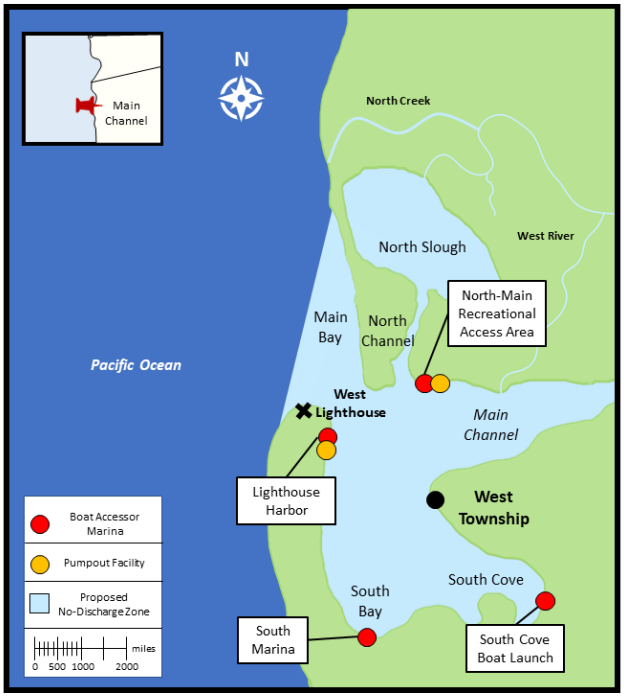


Figure 7. Map of areas of intensive boating activity, including boat launches and access points as well as pumpout facilities, in Main Channel.

North-Main Recreational Access Area. This access area is located at the north end of Main Channel on the east side of North Channel about 1.75 miles east of the Main Bay entrance. The access area currently operates two stationary pumpout facilities, which are located at either end of the facility pier.

Lighthouse Harbor. This harbor is located near the south entrance of Main Bay, approximately 0.5 miles from West Lighthouse. Lighthouse Harbor is closer to the bay entrance off Main Channel than the North-Main Recreational Access Area. It operates a portable pumpout cart that can be moved to different areas of the facility to service vessels.

South Marina. This marina is in the southern portion of South Bay, approximately 1 mile from the Main Bay entrance. This marina is a popular departure location for whale watching boats and dive

expeditions. However, there are no pumpout facilities at this location, so vessels use the one at Lighthouse Harbor.

South Cove Boat Launch. This boat launch is located in a sheltered area on the eastern portion of South Cove, approximately 3 miles from the Bay entrance and 2.5 miles south of the Bayside Channel. This is purely a boat launch and as such operates no pumpout facility and is largely unattended.

Table 1 below provides the names and addresses for the four facilities described above. The table also provides information on hours of operation, number of pumpout facilities by type (e.g., stationary, cart, boat, barge), fee (per use or per gallon), and the operating capacity of the facility (in gallons per minute). The physical accessibility of vessels to each pumpout facility is also captured in the table, including the mean low water depth adjacent to each facility, the maximum draft of vessels that can use each facility, and the estimated percentage of vessels precluded from using each facility based on draft limitations. It is estimated that 5 percent of recreational vessels with installed toilets using the Main Channel area have a draft that would exclude them from accessing the facility at Lighthouse Harbor. The other 95 percent of recreational vessels would not be excluded from accessing any pumpout facilities. The commercial fishing vessels all have a shallow draft of less than 10 feet. These vessels operate in Main Bay and can access the two pumpout facilities in their vicinity. There are no bridges in the proposed no-discharge zone, therefore, no maximum height limitations exist.

The information presented in the table is correct as of March 2022 and has been confirmed by facility personnel.

Table 1. Pumpout Facility Information.

Name	Waterfront Facility Information (all in West, US 98765)	Hours of Operation	Mean Low Water Depth	Draft	Vessels Excluded (%)	Number of Pumpout Facilities by Type	Fee (per use or per gallon)	Operating Capacity (gal/min)
North-Main Recreation Access Area	**123 Bay Road** William Smith (123) 555-2424 Ch 16 VHF-FM	April – October: M-F: 8 am – 8 pm S & S: 7 am – 10 pm November – March: 10 am – 4 pm daily	15 ft.	10 ft.	0%	Stationary: 2	Free to public	88
Lighthouse Harbor	**345 Surf Road** Ed Johnson (123) 555-2300 Ch 16 VHF-FM	M-F: 8 am – 8 pm Sat: 7 am – 11 pm Sun: 7 am – 10 pm	12 ft.	7 ft.	5%	Cart: 1	Public: $5 Commercial vessels: $10	25
South Marina	**12 Island Road** Joseph Hill (123) 555-1300 Ch 12 VHF-FM	M-F: 10 am – 10 pm Sat: 8 am – 11 pm Sun: 7 am – 10 pm	30 ft.	25 ft.	NA	NA	NA	NA
South Cove Boat Access	**25 Tidal Road** Susan Williams (123) 555-1111 Ch 14 VHF-FM	M-Th: 10 am – 5 pm F & Sat: 7 am – 10 pm Sun: 7 am – 9 pm	13 ft.	8 ft.	NA	NA	NA	NA

Sources: Personal communication with owners/operators of facilities.

FACILITY MAINTENANCE
The available facilities are all self-service. Signs are posted with the proper operating procedures, however, personnel check on the pumpout facilities several times a day (especially during periods of heavy use) to prevent misuse and/or problems from occurring. The pumpout facilities are inspected and cleaned once a week and thoroughly checked and repaired once a year (usually during off-peak months).

FACILITY WASTE TREATMENT METHODS
The two stationary pumpout facilities located at North-Main are connected to the Municipal Sewage Treatment Plant, which is located 9 miles from the access area. The Municipal Sewage Treatment District has made an agreement with the State Department of Environment Protection (DEP) to accept vessel sewage. The Municipal Sewage Treatment Plant is in compliance with all applicable regulations.

The 115-gallon pumpout cart at Lighthouse Harbor is offloaded into a 600-gallon on-site holding tank. Once a week, or more often when the tank level is near capacity, the facility is serviced by a licensed septage hauler (Main Bay Pumpout Services) that transports sewage to the Municipal Sewage Treatment Plant.

3.1.B. Recreational Vessels

The waterfront facilities in the Main Channel area keep records on the number and size of county registered and transient vessels. Although not all vessels use these four facilities, these numbers combined with registration records for West County should provide an accurate estimate for vessel use in the Main Channel area. This area receives a significant level of transient traffic. The number of transient vessels was estimated by the number recorded during the 2019 Labor Day weekend.

The following worksheet was used to estimate the number of vessels operating an MSD in the proposed no-discharge zone (the assumed percentages of each vessel length class operating an MSD provided by EPA were used). It is assumed that 40% of these vessels would be operating over a peak holiday weekend and would require a pumpout service during this time. The worksheet shows that an estimated 542 vessels would operate an MSD and need to use a pumpout facility during a peak holiday weekend.

There are three pumpout facilities servicing recreational vessels in this area, as described previously. Facility owners were contacted to assist in estimating the number of vessels that each facility can service per hour. Given this and their weekend operating hours, the number of vessels that each pumpout facility can service on a given weekend was calculated. Based on this worksheet, adequate pumpout facilities are reasonably available for the recreational vessel population.

RECREATIONAL VESSEL WORKSHEET

Part 1: Calculate the total number of recreational vessels with MSDs

	4,114	Total number of recreational vessels less than 26 feet
X	0.20	Percent of vessels less than 26 feet with MSDs (assume 20% if unknown)
=	823	Number of recreational vessels less than 26 feet with MSD

A

	817	Total number of recreational vessels 26 – 40 feet
X	0.50	Percent of vessels 26 – 40 feet with MSDs (assume 20% if unknown)
=	409	Number of recreational vessels 26 – 40 feet with MSD

B

	121	Total number of recreational vessels over 40 feet
X	1	Percent of vessels over 40 feet with MSDs (assume 20% if unknown)
=	121	Number of recreational vessels over 40 feet with MSD

C

Add calculations (A+B+C) together for total number of recreational vessels with MSDS: 1,353

Part 2: Calculate estimated number of vessels needing pumpout service

→	1,353	**Total number of recreational vessels with MSD (See Part 1)**
X	0.40	Peak occupancy rate (e.g., holiday weekend)(assume 40% if unknown)
=	542	**Number of recreational vessels needing pumpout service**

D

Part 3: Calculate the number of recreational vessels supported by existing pumpout facilities in the proposed area

Repeat the following calculation for each pumpout facility in the proposed area:

	8	Vessels served per hour at Pumpout 1 (use 4/hour if unknown)
X	32	Hours of operation during peak use (e.g., holiday weekend)
=	256	Number of vessels served by Pumpout 1

	8	Vessels served per hour at Pumpout 2 (use 4/hour if unknown)
X	32	Hours of operation during peak use (e.g., holiday weekend)
=	256	Number of vessels served by Pumpout 2

	4	Vessels served per hour at Pumpout 3 (use 4/hour if unknown)
X	30	Hours of operation during peak use (e.g., holiday weekend)
=	120	Number of vessels served by Pumpout 3

E

Add results of all Part 3 calculations together for total number of vessels served by existing pumpout facilities: 632

Result: Compare the number of recreational vessels needing pumpout service (D) = 542
with the number of vessels served by existing pumpout facilities (E) = 632

Costs incurred by recreational vessels as a result of a no-discharge zone designation include pumpout facility use fees and retrofit costs. Because the two stationary facilities are free to use, and the pumpout cart is only $5 per use, pumpout facility use costs are expected to be minimal. Based on surveys of potentially impacted boaters, it is estimated that the cost to retrofit will be about $1,500 per vessel.

3.1.C. Commercial Vessels

The only commercial vessels that use or transit through the Bayside Channel area are ten fishing vessels. They have a three-month operating season, from January to March. They are restricted to fishing activities between Monday and Friday. On average, there are two crew members per vessel. All the commercial vessels currently have a Type III MSD (holding tank) installed. As such, no retrofit costs are expected.

The fishing vessels operate from Lighthouse Harbor but primarily utilize the stationary pumpout located at North-Main Recreational Access. The operating hours for this facility are found in Table 1. Commercial vessels pay a higher fee of $10 to use this facility. Because of the relatively small amount of sewage produced daily by the crew, these vessels are typically pumped out once per week. Because the commercial vessels only operate during weekdays, there are usually a low number of recreational vessels needing to pump out at this time, so no wait time is expected to access facilities.

Conclusion

For the protection and enhancement of waters used by the general public (for various commercial and recreational marine activities), fishery resources, and other marine life and habitat, it is requested that a no-discharge zone be established for the coastal waters in West Township in Coastal County. A compilation map can be seen in Figure 8 below.

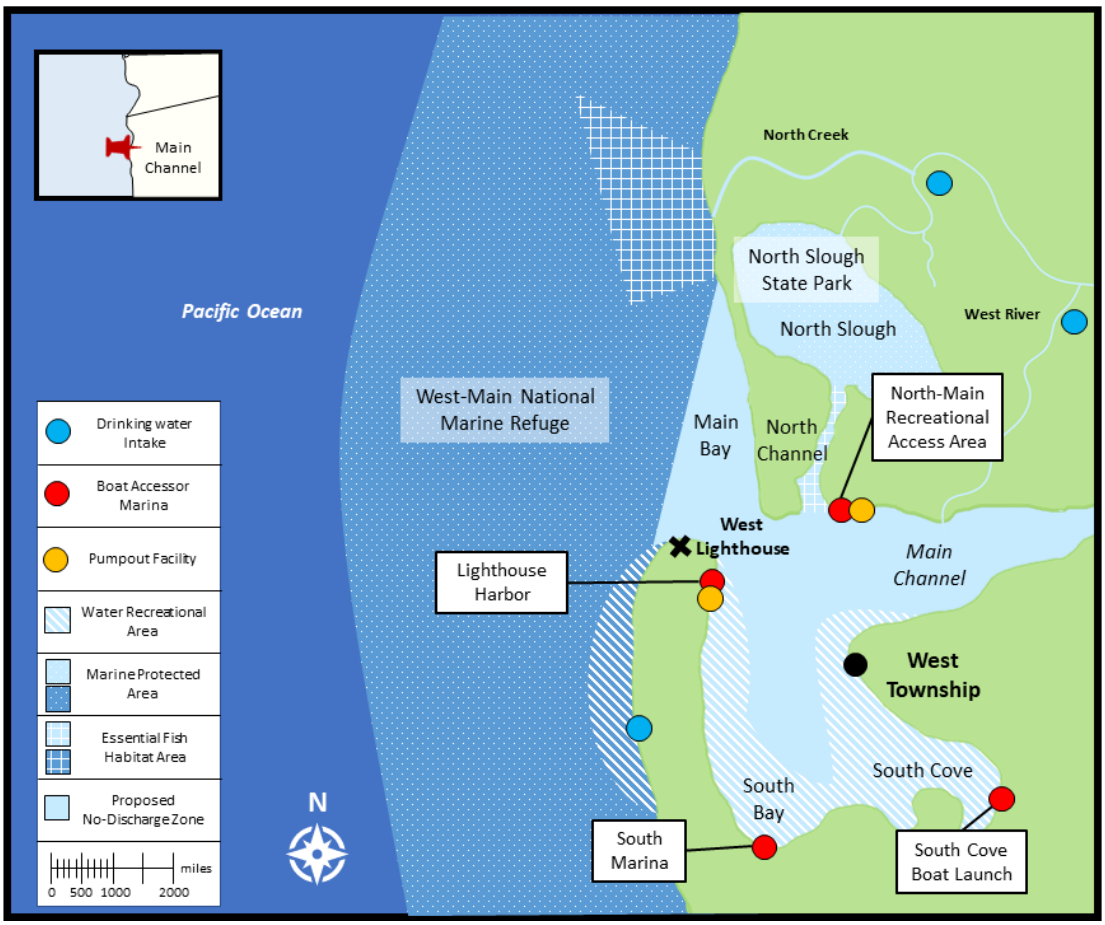


Figure 8. Map of proposed no-discharge zone and the drinking water intakes, boat accesses, pumpout facilities, recreational areas, aquatic sanctuaries, and essential fish habitats in the area surrounding and in Main Channel.

Section 312(f)(4)(B) Sample Application

Application to Designate Alpha Channel and Surrounding Waters as a Vessel Sewage No-Discharge Zone (Clean Water Act Section 312(f)(4)(B))

Note: Because this sample application describes a fictional location, a USGS topographical quadrant map or NOAA nautical chart are not provided for purposes of fulfilling the application requirement described in Section 4.1.3.

Contents

1.0 Description of Waters Proposed for Protection

Alpha Channel (hereafter referred to as the Channel) is the main shipping and commerce entry and exit point for goods transported from the Southern US and Gulf of Mexico to the Northern US along the Omega River. The center of the Alpha Channel is located at 30˚ 40’ 64.2955” N, 88˚ 53’ 44.8936” W. The Channel goes past the popular port town of Delta City which sits 4.5 feet below sea level, famous for its trade as well as its tourism. The Channel and other tributaries connected to the Omega River outflow to the Gulf of Mexico. The Channel runs approximately 25 miles east to west, from the Iota Inlet – which connects to the Omega River via the Omega-Iota Canal – to the Omega Delta, the largest Delta in the southeastern United States. Alpha Channel ranges in width from 0.5 miles to 5 miles.

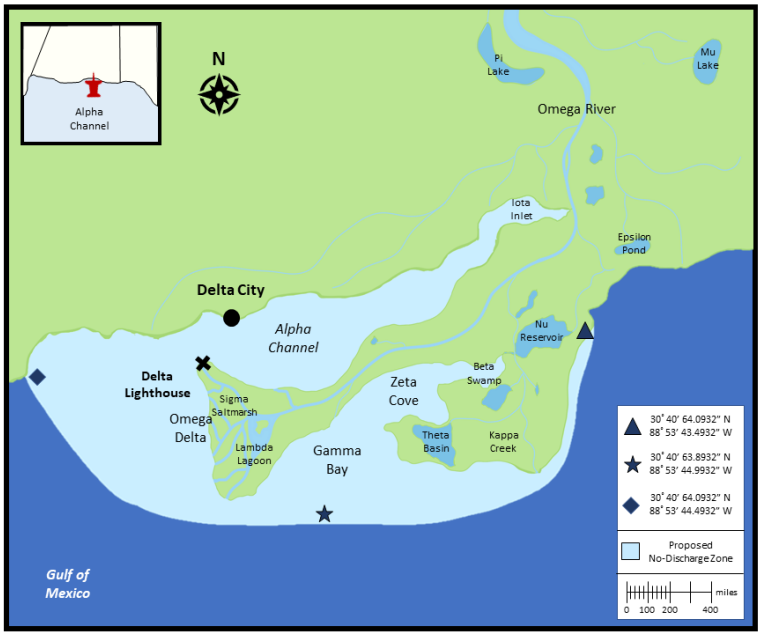


Figure 1. Proposed no-discharge zone around Alpha Channel.

The Channel is fed by multiple tributaries of the Omega River and Omega Delta, much of which goes through wetlands that filter and collect sediment, but also is subject to tidal inflows and outflows of the Gulf and Gamma Bay once a day. The extent of the proposed no-discharge zone for the Channel is shown in Figure 1. The proposed waters include water surrounding outflows from the Omega River or Delta that may then flow into or out of the Channel. These are highly variable areas in terms of mean water depth and flow rates as the lands are subject to flooding as they are below sea level, sometimes nullifying or changing perceived barriers for waterbodies, and at others allowing for saltwater intrusion of groundwater sources. This can happen seasonally in the later summer and early fall which constitutes hurricane season for this geographic region.

The eastern edge of the proposed no-discharge zone is at 30˚ 40’ 64.0932” N, 88˚ 53’ 43.4932” W, just east of the Nu Reservoir which provides potable water for a portion of the people living in the area. The southern edge of the zone falls at 30˚ 40’ 63.8932” N, 88˚ 53’ 44.9932” W, one to three miles south of the innermost section of Gamma Bay, dependent on water levels. The western end of the proposed zone is at 30˚ 40’ 64.0932” N, 88˚ 53’ 44.4932” W, outside of the western boundary of Delta City. This is also the area in which all Gulf-to-Omega River-based vessels must enter and exit the Alpha Channel, making it a high vessel traffic location. The northern boundary is where the Iota Inlet and Omega River meet at the Omega-Iota Canal, which is already designated as a no-discharge zone because of its status as an important body of water and the water’s previous Clean Water Act Section 303(d) listing as impaired due to harmful algal blooms caused by increased temperature and non-point source pollutants.

For the protection and enhancement of waters used by the general public mainly for clean drinking water, as well as for various commercial and recreational marine activities, fishery resources, and other marine life and habitat, it is requested that a no-discharge zone be approved under Clean Water Act Section 312(f)(4)(B) for the coastal waters around the Alpha Channel in Gulf Parrish.

2.0 Basis of Need for Proposed No-Discharge Zone

2.1 Drinking Water Supply Intakes and Community Served Information

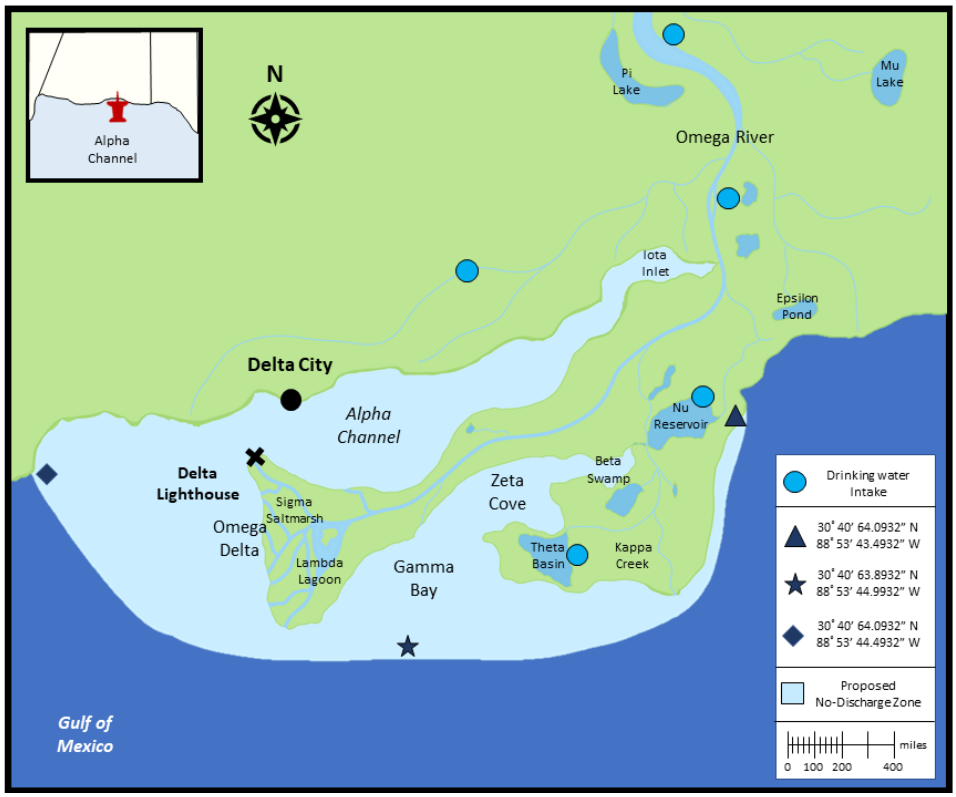


Figure 2. Drinking water intakes connected to or near the Alpha Channel and proposed no-discharge zone.

The community surrounding Delta City and the Alpha Channel live in an area below sea-level where fresh groundwater intakes or surface water intakes can experience saltwater intrusion, impacting the roughly 400,000 residents of the area. Saltwater also impacts the infrastructure in which freshwater travels, with pipes requiring frequent replacement. Degradation of freshwater sources, such as through fecal contamination from vessel sewage discharges, could create water supply problems impacting all of Gulf Parrish. Establishment of a no-discharge zone would complement other efforts being undertaken by the local government to manage pollution inputs, including fecal pollution, such as wastewater infrastructure improvement and a project to identify leaking septic tanks in the area.

North Delta City Municipal Intake – 30˚ 40’ 64.1198” N, 88˚ 53’ 44.2977” W

This westernmost water intake sits northeast of Delta City after a fork in the river leading to the Alpha Channel. The average 50,000 gallons of water per day are primarily stored and treated as the city’s emergency water supply in the case of a natural disaster, such as a hurricane. The maximum flow has been recorded at 90,000 gallons per day. As this is in a high traffic area with numerous potential pollution sources – directly south of farmland and near Delta City – this intake commonly experiences periods of shutdown due to inability to meet water quality standards. This intake alone cannot serve as the main source for the 300,000 residents of Delta City but can serve the water needs of about 20,000 homes located on the tributary waterways.

Theta Basin Desalination Plant and Freshwater Intake – 30˚ 40’ 63.9987” N, 88˚ 53’ 44.2788” W

The Theta Basin Intake is the smallest of the intakes and serves mainly a small population of scientists and students (~2,000 people/visitors per year, with a resident group of 150) that operate from the Theta Basin Research Center, where the groups from several universities and the State Sea Grant conduct oyster reef and wetland restoration experiments aimed at creating living shorelines to decrease coastal erosion in the face of sea level rise. The average flow is 5,000 gallons a day from Theta Basin and an additional 20,000 saltwater gallons per day from Gamma Bay that is used and filtered for water table experiments for the ecological research groups. There is also a small desalination plant for instances of flooding and saltwater intrusion. The maximum flow from the Basin is 10,000 gallons per day.

Nu Reservoir Intake – 30˚ 40’ 64.1232” N, 88˚ 53’ 43.5932” W

This intake serves 50,000 residents of eastern Delta City. The intake averages 50,000 gallons per day and 80,000 gallons per day maximum. It is largely undisturbed and the water it retrieves is some of the least polluted of any of the intakes since it is located on the easternmost edge of the Parrish where there are fewer people and less vessel traffic.

Omega River Oxbow Intake – 30˚ 40’ 66.0117” N, 88˚ 53’ 43.55932” W

The Omega River Oxbow Intake is the major source of water for 300,000 people in Delta City and 500,000 in Gulf Parrish. The intake was once part of an oxbow lake where there was river migration but is now in a protected area of the river where vessels are not allowed to pass. The maximum flow is 750,000 gallons per day with an average of 500,000 per day. This source is upriver enough to not be impacted by saltwater intrusion but can be minorly impacted by nutrient runoff of local farms and some pollutants from the Omega Shipping Lane.

Omega Riverbend Intake – 30˚ 40’ 68.1470” N, 88˚ 53’ 43.6532” W

This Intake supplements the Omega River Oxbow Intake to combined serve the Delta City and Gulf Parrish area. The intake was once part of an oxbow lake where there was river migration but is now in a protected area of the river where vessels are not allowed to pass. The maximum flow is 800,000 gallons per day with an average of 700,000 per day. This source is farthest upriver and is usually only impacted by the Omega Shipping Lane.

2.2 Justification of Size of Proposed Drinking Water Intake Zone

2.2.A. Boating Activity Surrounding Intakes

The Alpha Channel is primarily used by commercial vessels as it is the main ingress and egress point to the Omega River and Omega Shipping Lane, the largest in the United States. Cargo ships transport $300 billion worth of goods annually along the River year-round. Though these ships may have relatively small crews for their size, vessel sewage discharges into the warm waters of the Gulf and Channel can greatly increase fecal coliform levels which, along with agricultural and industrial runoff, can necessitate the closure of the many shellfisheries in the Bay. These closures can result in the loss of billions of dollars in economic activity for the state (State Fisheries Council Report). The Omega River is already a no-discharge zone, meaning that discharges are primarily occurring in the Alpha Channel. For vessels with holding tanks, pumpout stations are present at the Port of Delta City and along the Omega-Iota Canal. However, in 2016, over 50 cargo ships were fined for improper discharge of over 5,000 gallons of

sewage (State Enforcement Agency Report). When the area around the Channel floods, water quality decreases significantly in wetlands where there can be die-offs of fish and birds, and toxins from harmful algal blooms brought on by nutrient overload can impact the health of local populations. This pollution could also especially impact the water intakes near tributaries, possibly increasing water treatment costs for the area. Therefore, greater protection of the surface water is required than the applicable federal standards to maintain higher water quality and protect public resources, including beaches and essential fish habitat, that are threatened by vessel sewage pollution.

Facilities

There are two waterfront facilities (e.g., ports, harbors, marinas) with pumpout facilities suited for cargo vessels in the proposed Alpha Channel no-discharge zone. These ports are also accessible to the public. Figure 3 shows the geographic location of these facilities within the proposed Alpha Channel no-discharge zone.

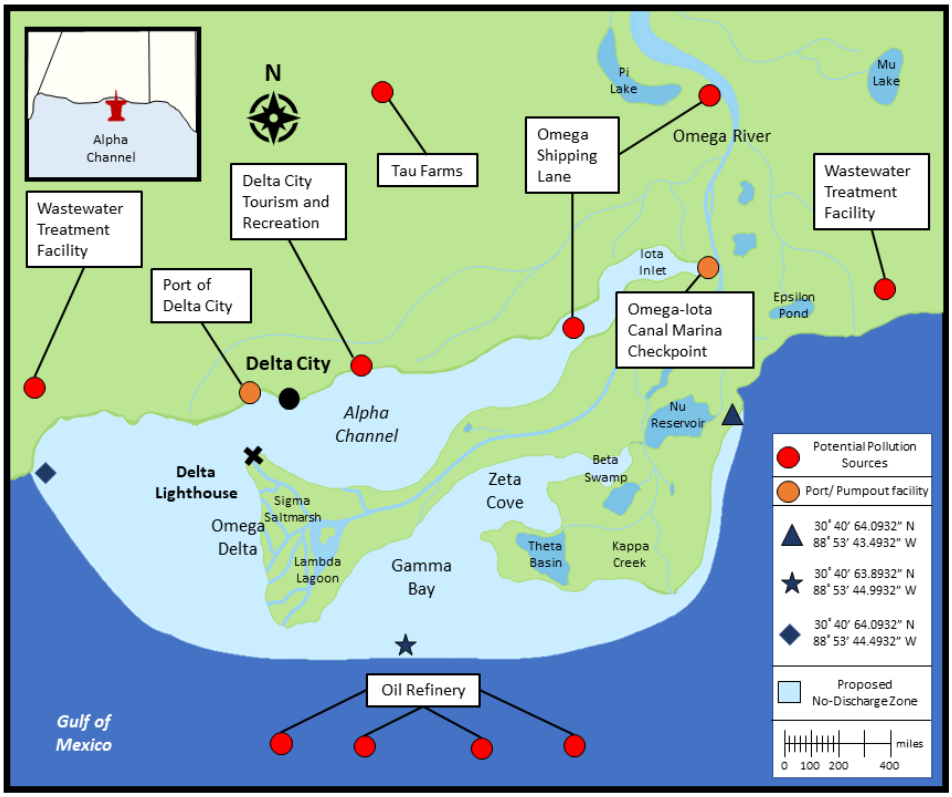


Figure 3. Map of proposed no-discharge zone, water intakes, and potential pollution sources in Alpha Channel.

Port of Delta City. The port is located on the north mainland at the entrance of the Alpha Channel. The port is directly across from the Delta Lighthouse that sits on the Omega Delta Peninsula.

The port operates 50 in-slip pumpout facilities that can accommodate cargo container ships located at the western end of the port, and an additional 30 pumpout facilities on the eastern end of the port for smaller commercial vessels. The pumpout facility also accommodates sewage from portable toilets and recreational vessels.

Omega-Iota Canal Marina Checkpoint. The marina is located where the Iota Inlet meets the Omega River and serves also as a control for goods and vessels traveling north and south on the Omega River. It is either the first marina entering the River or the last exiting. It operates 50 portable pumpout carts that can be moved to different areas of the marina to service vessels up to 100 feet away in the limited canal space.

Table 1 below provides the names and addresses for the facilities described above. The source of this information is the "Omega River Cargo Boat Rules and Regulations" circular (Omega River Trade and Commerce Council, 2019). The table also provides information on hours of operation, number of pumpout facilities by type (e.g., stationary, cart, boat, barge), fee (per use or per gallon), and the operating capacity of the facility (in gallons per minute). The physical accessibility of vessels to each pumpout facility is also captured in the table, including the mean low water depth adjacent to each facility, the maximum draft of vessels that can use each facility, and the estimated percentage of vessels precluded from using each facility based on draft limitations. Pumpout facilities are accessible to all vessels (commercial or recreational) with no draft limitations. There are no bridges in the proposed no-discharge zone, therefore, no maximum height limitations exist. The information presented in the table is correct as of May 2019 and has been confirmed by port personnel.

Table 1. Pumpout Facility Information.

Name	Waterfront Facility Information (Delta, US 54321)	Hours of Operation	Mean Low Water Depth	Draft	Vessels Excluded (%)	# Pumpout Facilities by Type	Fee (per gallon)	Operating Capacity (gal/min)
Port of Delta City	**123 Delta Road** William Smith (123) 555-2424 Ch 16 VHF-FM	M-F: 8 am – 8 pm S & S: 7 am – 10 pm	25 ft.	10 ft.	0%	Stationary: 80	Free to public Commercial vessels: $11	100
Omega-Iota Canal Marina Checkpoint	**345 Swamp Way** Ed Johnson (123) 555-2300 Ch 16 VHF-FM	Open 24 hours a day	40 ft.	7 ft.	0%	Portable carts: 50	Public: $5 Commercial vessels: $10	100

Sources: Omega River Trade and Commerce Council 2019 records.

FACILITY MAINTENANCE

The sewage reception facilities at all pumpouts for recreational vessels are self-service. Signs are posted with the proper operating procedures; however, port personnel continuously check on the equipment. The pumpout facilities are inspected and cleaned once a day and thoroughly checked and repaired once a month. For commercial vessels and cargo ships, pumpouts are staffed by port personnel. The pumpout facilities are inspected and cleaned once a day and thoroughly checked and repaired once a week due to heavy use.

FACILITY WASTE TREATMENT METHODS

The pumpout facilities at both ports are connected to the wastewater treatment plants closest to them, approximately 5 miles from Port of Delta City and 8 miles from Omega-Iota Marina. The Wastewater Treatment Facility Group has made an agreement with the State Department of Environment Protection (DEP) to accept vessel sewage. Both wastewater treatment plants are in compliance with applicable effluent guidelines.

Recreational Vessels

The waterfront facilities in Alpha Channel area keep records on the number and size of county-registered and transient vessels. These numbers combined with registration records for Gulf Parrish should provide an accurate estimate for vessel use in the Alpha Channel area. Due to the high cargo ship

traffic, Alpha Channel has a low level of transient traffic. The number of transient vessels was estimated by the number recorded during the 2019 Labor Day weekend.

RECREATIONAL VESSEL WORKSHEET

Part 1: Calculate the total number of recreational vessels with MSDs

	3,695	Total number of recreational vessels less than 26 feet
X	0.20	Percent of vessels less than 26 feet with MSDs (assume 20% if unknown)
=	739	Number of recreational vessels less than 26 feet with MSD

A

	328	Total number of recreational vessels 26 – 40 feet
X	0.50	Percent of vessels 26 – 40 feet with MSDs (assume 20% if unknown)
=	164	Number of recreational vessels 26 – 40 feet with MSD

B

	47	Total number of recreational vessels over 40 feet
X	1	Percent of vessels over 40 feet with MSDs (assume 20% if unknown)
=	47	Number of recreational vessels over 40 feet with MSD

C

Add calculations (A+B+C) together for total number of recreational vessels with MSDS: 950

Part 2: Calculate estimated number of vessels needing pumpout service

	950	**Total number of recreational vessels with MSD (See Part 1)**
X	0.40	Peak occupancy rate (e.g., holiday weekend)(assume 40% if unknown)
=	380	**Number of recreational vessels needing pumpout service**

D

Part 3: Calculate the number of recreational vessels supported by existing pumpout facilities in the proposed area

Repeat the following calculation for each pumpout facility in the proposed area:

	8	Vessels served per hour at Pumpout 1 (use 4/hour if unknown)
X	30	Hours of operation during peak use (e.g., holiday weekend)
=	240	Number of vessels served by Pumpout 1

	4	Vessels served per hour at Pumpout 2 (use 4/hour if unknown)
X	48	Hours of operation during peak use (e.g., holiday weekend)
=	512	Number of vessels served by Pumpout 2

E

Add results of all Part 3 calculations together for total number of vessels served by existing pumpout facilities: 752

Result: Compare the number of recreational vessels needing pumpout service (D) = 380 with the number of vessels served by existing pumpout facilities (E) = 752

The worksheet on this page was used to estimate the number of recreational vessels operating an MSD in the proposed no-discharge zone (the assumed percentages of each vessel length class operating an MSD provided by EPA were used). It is assumed that 40% of these vessels would be operating over a peak holiday weekend and would require a pumpout service during this time. The worksheet shows that an estimated 380 vessels would operate an MSD and need to use a pumpout facility during a peak holiday weekend.

There are two pumpout facilities servicing recreational vessels in this area, as described previously. Port personnel were contacted to assist in estimating the number of vessels that each facility can service per hour. The two pumpout facilities are estimated to be fully capable of servicing the number of vessels needed during peak usage.

Commercial Vessels

The majority of vessels using Alpha Channel are commercial vessels, largely cargo ships. These ships operate daily year-round, with higher activity in the winter due to increased demand for goods. On average, there are 10 crew members per vessel. About 50 percent of the vessels operate Type II MSDs, while the remainder already have holding tanks installed. The vessels operate from both ports and those with holding tanks use the stationary pumpouts when in port. Port operators indicated to state personnel preparing this application that the available pumpout facilities would be able to service all of the cargo ships should a no-discharge zone be designated. This is due to the high number of pumpout facilities available and the ability to pump out the vessels while conducting other activities, such as cargo offloading/onloading. As such, wait times are not generally expected to access facilities. As noted previously, the stationary pumpouts has a direct connection to the sewer system.

A complete prohibition of vessel sewage discharges in the proposed area could decrease overall pollution and stress on the ecosystem which works to naturally clean the water in the wetland areas. This could help decrease water treatment costs and allow for more intake and storage that will provide water security for the area in a state of emergency. The proposed area is so large due to the flooding and mixing risks posed in all areas surrounding the Channel which would allow any pollutants to reach anywhere there is water. Evidence of this has been shown by multiple water flow modeling efforts and monitoring completed by scientists at the Theta Basin Research Center.

In a 2017 study, Doe *et al.* used unique harmless carbon isotopes in varying amounts and released them in different locations throughout the Channel at different times of the year. Evidence of the isotopes were found in winter up to five miles upstream, two miles offshore, and only at the water intake that is north of Delta City. But during flooding and hurricane season, isotopes were found in small amounts up to 50 miles upstream on the Omega River, and in amounts that if harmful could potentially shutdown aquaculture at each freshwater intake within a 20-mile radius of the Channel. Researchers went on to model these flows given different currents and weather patterns and found that even small quantities of vessel sewage, when combined with small quantities of other pollutants, could have detrimental impacts to shellfish, increase the cost of water treatment, and possibly create an economic downturn for the region (Doe, *et al.* 2018).

2.2.B. Other Impairment Sources

Outside of pollution originating from vessel traffic, the primary other potential contributor of fecal and other pollution are the farms to the north west of the Channel. Nitrogen and phosphorous from fertilizers can drain into either the Omega River or one if its tributaries into the Channel. These nutrients increase the likelihood of primary productivity, i.e. increased algal and aquatic plant growth, which can be harmful in a few ways: (1) some algal blooms may produce toxins, degrading water quality and aquaculture, causing losses in revenue and health impacts; (2) breakdown of dying vegetation can lead to ‘dead-zones’ wherein there is no longer enough oxygen to sustain aquatic life; or (3) aquatic plants block waterways, slowing traffic, increasing the likelihood of improper discharge and decreasing revenue

flow. In one example from 2014, agricultural runoff created a dead zone in the Gulf and Bay of about 4,000 sq miles (State Department of Boating and Waterways and State Department of Agriculture).

Though regulations exist to help decrease these other sources of degradation, the benefit of no-discharge zones significantly decreases the impact of these sources, thereby decreasing the cost of water treatment (Water Treatment District Report).

Conclusion

As described in this application, designation of a no-discharge zone is necessary to protect drinking water intakes used to supply potable water to the local community. Improved water quality may also decrease costs associated with water treatment, in addition to many tangential benefits for recreation and shellfishing. Additionally, the resident and transient vessel populations are well-served by existing pumpout facilities at two conveniently located and regularly used ports in the area.

As such, it is requested that a Clean Water Act Section 312(f)(4)(B) no-discharge zone be established for the coastal waters of Delta City in Gulf Township surrounding Alpha Channel and its tributaries and its connected bodies of water.

Appendix B: Overview of Related Programs

There are several other key federal laws and provisions that relate to the discharge of sewage from vessels. These include:

- Clean Vessel Act of 1992;
- Coastal Zone Management Act of 1972 (CZMA) and Coastal Zone Act Reauthorization Amendment of 1990 (CZARA);
- CWA Section 319 – the Non-Point Source Management Programs; and,
- Title XIV – Certain Alaskan Cruise Ship Operations

There are also three additional CWA provisions for the regulation of discharges incidental to the normal operation of a vessel *other than* sewage, specifically:

- CWA Section 312(n) – the Uniform National Discharge Standards
- CWA Section 312(o) – the Clean Boating Act
- CWA Section 312(p) – the Vessel Incidental Discharge Act

Finally, there is an international convention that addresses the prevention of pollution from ships – the International Convention for the Prevention of Pollution from Ships (MARPOL) – that has an annex dedicated to sewage (Annex IV).

While these laws and convention do not directly influence either the state's application requirements or EPA's determinations on vessel sewage no-discharge zones, states may find this information useful in the larger context of vessel discharge regulation. CWA Sections 312(n) and 312(p) include provisions for no-discharge zones for vessel discharges regulated under those sections, but each varies from the provisions of CWA section 312(f).

Clean Vessel Act of 1992

The Clean Vessel Act of 1992, Subtitle V(F) of Pub. L. No. 102-587 (Nov. 4, 1992), authorizes the Director of the U.S. Fish and Wildlife Service to award federal grants to states, on a competitive basis, for the construction, renovation, operation, and maintenance of vessel sewage pumpout facilities for recreational boaters. The grants may also support education and outreach activities, as well as surveying efforts to determine the status of existing facilities and the need for additional facilities.

States should determine whether waterbodies being considered for discharge prohibitions require additional facilities that may be funded by this annual grant opportunity. Information on the grant program's information collection, record keeping, and reporting requirements, eligible grant activities, grant application procedures, grant proposal guidelines, the grant selection criteria and processes, conditions on the use and acceptance of funds granted (e.g., fee charges for use of facilities, maintenance of facilities), and non-federal match requirements may be requested from the U.S. Fish and Wildlife Service.

Additionally, state and local officials may benefit from consulting technical guidelines issued by the U.S. Fish and Wildlife Service titled "Clean Vessel Act: Pumpout Station and Dump Station Technical Guidelines." The guidelines provide states with technical information for evaluating the adequacy, type,

and location of pumpout stations and dump stations, surveying and developing plans for pumpout stations and dump stations, developing education and information plans, and constructing pumpout stations and dump stations. If states have used these guidelines to collect information for grant applications, some of this information, such as surveys of pumpout stations, may be reused for no-discharge zone applications.

An overview of the program is provided in the table below.

Table B-1: Clean Vessel Act Grant Program

Area of Focus:	Dump station and pumpout station construction, renovation, operation, and maintenance; facility and station development and planning (coastal states only); related education/information programs; surveys of the status of existing facilities and need for additional facilities (coastal states only)
Pertinence to Control of Vessel Discharges:	• Supports development, planning, construction, renovation, operation, and maintenance of boater pumpout stations and dump stations • Provides support and guidance on grant application process • Supports vessel discharge-related public awareness programs
Type:	Grants; guidelines
Authorized Agency:	U.S. Department of the Interior, Fish and Wildlife Service
Legislative Authorization:	Clean Vessel Act of 1992
Program Objective:	To provide funds to states for the construction, renovation; operation, and maintenance of pumpout stations and dump stations to improve water quality
Eligible Applicants:	An agency of the state designated by the Governor
Funding Requirements:	At least 25 percent of the cost of the proposed activities must be funded by other sources.
Program Restrictions:	Eligible grant activities are limited to those serving recreational interests. Grants cannot be used for activities that do not provide public benefits; enforcement activities; construction/renovation of "upland" restroom facilities; or construction renovation, operation, and maintenance of on-site sewage treatment plants and of municipal sewage treatment plants
Additional Information:	• 59 Fed. Reg. 11204 (Mar. 10, 1994) • 59 Fed. Reg. 11290 (Mar. 10, 1994)

Coastal Zone Management Act of 1972 (CZMA) and Coastal Zone Act Reauthorization Amendment of 1990 (CZARA)

The Coastal Zone Management Act of 1972 (CZMA) was enacted to protect the coastal zone of the United States. Significant amendments in 1990, referred to as the Coastal Zone Act Reauthorization Amendment (CZARA), strengthened provisions for restoring and protecting coastal waters though measures to manage nonpoint source pollution. Sewage from a vessel is not considered a “pollutant” within the meaning of the CWA’s prohibition against unpermitted discharge of a pollutant, so sewage from vessels is a form of nonpoint source pollution. CZARA required each coastal state administering a CZMA program to update and expand its Clean Water Act nonpoint source management program in

conformity with an EPA guidance specifying management measures to control coastal nonpoint source pollution.

The 1993 EPA guidance for development of the Coastal Nonpoint Pollution Control Programs includes management measures and practices for marinas and other nonpoint pollution sources. The management measures and related practices address sewage facilities (pumpout facilities, dump stations, and shoreside restrooms). If a state has developed and implements management measures related to marinas and recreational boating, such as installing pumpout stations, available materials may assist in developing a no-discharge zone application.

CWA Section 319

The Clean Water Act, as amended in 1987 to add a new Section 319 captioned "nonpoint source management programs," enhanced federal leadership in support of state and local nonpoint source pollution control efforts. Under a federal grant program, a state that develops and submits a state management program (approved by EPA) is eligible for grant funding to implement the state program, including technical assistance and demonstration projects, targeting nonpoint source pollution reduction. For example, in Federal Fiscal Year 2019, the federal program distributed grants in the amount of approximately $165.4 million. States may consider applying for grant funding under this program to construct vessel sewage pumpout facilities for commercial vessels, since the funding opportunity under the Clean Vessel Act is limited to recreational vessel users.

An overview of the program is provided in the table below.

Table B-2: Nonpoint Source Implementation Grants (319 Program)

Area of Focus:	Implementation of EPA-approved state nonpoint source management programs
Pertinence to Control of Vessel Discharges:	• Supports and provides guidance on implementation of state nonpoint source management programs • Identifies vessel sewage discharges as a nonpoint source pollution
Type:	Grants; guidance
Authorized Agency:	U.S. Environmental Protection Agency, Office of Water
Legislative Authorization:	Clean Water Act Section 319
Program Objective:	To assist states in implementing EPA-approved Section 319 nonpoint source management programs
Eligible Applicants for Federal Grants-in-Aid:	Lead nonpoint source agency in the states, the District of Columbia, American Samoa, Guam, Northern Marianas, Puerto Rico, Pacific Trust Territories, Virgin Islands, and Indian Tribes (funds can be distributed to other agencies or organizations through the nonpoint source agency)
Funding Requirements:	At least 40 percent of project or program costs must be provided by non-federal sources; state must meet maintenance of effort requirements (contained in Clean Water Act)
Program Restrictions:	Grants may be used only to support implementation of EPA-approved state nonpoint source management programs, and not to develop new programs or plans

Additional Information:	• "Nonpoint Source Program and Grants Guidelines for States and Territories" (April 2013) • "Section 319 Program Guidance: Key Components of an Effective State Nonpoint Source Management Program" (November 2012)

Title XIV – Certain Alaskan Cruise Ship Operations

In December 2000, Congress passed "Title XIV—Certain Alaskan Cruise Ship Operations" of the Miscellaneous Appropriations Bill (H.R. 5666) in the Consolidated Appropriations Act of 2001 (P.L. 106-554) ("Title XIV"). This legislation addresses the discharge of sewage and graywater from cruise vessels authorized to carry 500 or more passengers for hire ("cruise vessels") in Alaskan waters. Title XIV prohibits the discharge of untreated sewage from cruise vessels into the waters of the Alexander Archipelago or the navigable waters of the United States within the State of Alaska or within the Kachemak Bay National Estuarine Research Reserve ("applicable Alaskan waters"). Additionally, Title XIV generally prohibits the discharge of treated sewage or graywater from a cruise vessel into the applicable Alaskan waters unless the discharge complies with all applicable effluent standards and the vessel is underway at a speed of not less than six knots, at least one nautical mile from the nearest shore (except in areas designated by USCG), and is not in an area where the discharge is prohibited. While Title XIV provides for EPA to establish minimum effluent standards for treated sewage and graywater, it does not mandate that EPA do so.

Title XIV also directs the USCG to develop regulations establishing an inspection regime to verify that vessels operating in the applicable Alaskan waters are in compliance with Title XIV, the Federal Water Pollution Control Act, as amended, and any regulations issued thereunder, other applicable Federal laws and regulations, and all applicable international treaty requirements. The USCG's regulations – 33 CFR Part 159, Subpart E – govern the discharges of sewage and graywater from cruise vessels, require sampling and testing of sewage and graywater discharges, and establish reporting and record keeping requirements. Per Title XIV and USCG's regulations, until EPA promulgates regulations addressing effluent quality standards for cruise vessels operating in the applicable waters of Alaska, treated sewage and graywater may be discharged from vessels in circumstances otherwise prohibited based on speed or distance from shore provided that the necessary notification and demonstration of compliance are made to the Captain of the Port and the discharge satisfies certain effluent quality standards.

CWA Section 312(n) – the Uniform National Discharge Standards

The CWA was amended in 1996 to add Section 312(n) for establishment of the Uniform National Discharge Standards (UNDS) to mitigate adverse impacts on the marine environment from discharges incidental to the normal operation of a vessel of the Armed Forces. Section 312(n) requires EPA and the Department of Defense (DoD) to establish performance standards for marine pollution control devices (MPCDs) applicable to discharges, other than sewage, incidental to the normal operation of a vessel of the Armed Forces. The discharge standards are intended to stimulate the development of innovative vessel pollution control technology and to advance the development of environmentally sound ships by the military.

In 1999, EPA and the DOD characterized all discharges incidental to the normal operation of vessels of the Armed Forces to identify the discharges for which requiring an MPCD is reasonable and practicable. The federal agencies made the determinations based on the potential for adverse environmental

impact. Of the 39 identified discharges, the agencies determined it was reasonable and practicable to require controls for 25 of the discharges. The discharges to be regulated include: aqueous film-forming foam, catapult water brake tank & post-launch retraction exhaust, chain locker effluent, clean ballast, compensated fuel ballast, controllable pitch propeller hydraulic fluid, deck runoff, dirty ballast, distillation and reverse osmosis brine, elevator pit effluent, firemain systems, gas turbine water wash, graywater, hull coating leachate, motor gasoline compensating discharge, non-oily machinery wastewater, photographic laboratory drains, seawater cooling overboard discharge, seawater piping biofouling prevention, small boat engine wet exhaust, sonar dome discharge, submarine bilgewater, surface vessel bilgewater/oil-water separator, underwater ship husbandry, and welldeck discharge.

Section 312(n)(6)(A) prohibits states from adopting and enforcing any state or local regulation with respect to either the UNDS discharge or the design, construction, installation, or use of any MPCD to control discharges from a vessel of the Armed Forces. Section 312(n)(5)(D), however, allows a state Governor to petition EPA and the DoD to review the determinations made regarding the need for control or the established performance standards. Section 312(n)(7) also enables a state to apply to EPA to establish no-discharge zones for a discharge incidental to the normal operation of a vessel of the Armed Forces. This guidance does not address state applications for UNDS no-discharge zones; Section 312(n)(7) includes features similar to but distinct from both Sections 312(f)(3) and (f)(4).

CWA Section 312(o) – the Clean Boating Act

In 2008, Congress passed the Clean Boating Act (CBA), adding Clean Water Act Section 312(o) to control incidental discharges, other than sewage, from recreational vessels. National Pollutant Discharge Elimination System (NPDES) permits under Section 402 are not required for a discharge incidental to the normal operation of a recreational vessel. Section 312(o) requires EPA to identify discharges incidental to the normal operation of recreational vessels for which management practices are reasonable and practicable to develop management measures to mitigate adverse impacts to waters of the United States. In making this determination, EPA is directed to consider the nature of the discharge; the environmental effects of the discharge; the practicability of using a management practice; the effect that the use of a management practice would have on the operation, operational capability, or safety of the vessel; applicable Federal and State law; applicable international standards; and the economic costs of the use of the management practice.

After development of appropriate management practices for the identified discharges, Section 312(o) directs EPA to promulgate standards of performance for each management practice, after which the USCG promulgates regulations governing the design, construction, installation, and use of the management practices developed by EPA. CBA regulations do not preempt state or local law, except to the extent less stringent than the CBA regulations. After the effective date of the USCG regulations, the owner or operator of a recreational vessel shall neither operate in, nor discharge any discharge incidental to the normal operation of the vessel into, the waters of the United States or the waters of the contiguous zone, unless the owner or operator of the vessel is using the applicable CBA management practice meeting CBA standards. CWA Section 312(o) does not provide for no-discharge zones.

CWA Section 312(p) – the Vessel Incidental Discharge Act

The CWA was amended again in 2018 by the Vessel Incidental Discharge Act (VIDA), which added a new Section 312(p) applicable to discharges incidental to normal operation of certain vessels. Section 312(p) requires EPA and the USCG to develop regulations for incidental discharges from non-recreational, non-Armed Forces vessels that are 79 feet in length and greater. For ballast water, the regulations also apply to small vessels (less than 79 feet in length) and fishing vessels of all sizes. Section 312(p) requires that the discharge standards be "technology-based" and may be in the form of numeric effluent limits and/or best management practices.

Prior to VIDA, these incidental discharges had been regulated under a Section 402 NPDES "general permit," the Vessel General Permit (VGP), which EPA issued in 2008 and reissued in 2013. The VGP established effluent limits, as well as sampling, inspection, reporting, and recordkeeping requirements, for discharges incidental to the normal operation of commercial vessels. With limited exceptions, VIDA requires that the standards be at least as stringent as EPA's 2013 VGP requirements. Section 312(p)(3) requires continued compliance with the VGP requirements pending the effective date of the final VIDA regulations. Section 312(p)(10)(D) also provides for no-discharge zones and includes features similar to, but distinct from, both Sections 312(f)(3) and (f)(4).

MARPOL Annex IV

The International Convention for the Prevention of Pollution from Ships (MARPOL) is an agreement administered by the International Maritime Organization (IMO) concerning marine pollution originating from ships due to operational or accidental causes. MARPOL includes general regulations intended to prevent and minimize pollution from ships, as well as six technical Annexes that address oil, noxious liquid substances in bulk, harmful substances in packaged form, sewage, garbage, and air pollution, respectively. Annex IV, which is focused on vessel sewage, went into effect in September 2003 and is applicable to vessels on international voyages that are 400 gross tonnage and above or certified to carry more than 15 passengers and crew. MARPOL Annex IV requires each of these ships to have a valid International Sewage Pollution Prevention Certificate (ISPPC) issued by its flag Administrations (or representative).

Currently, the U.S. is signatory to Annexes I, II, III, V and VI and has incorporated the requirements of those Annexes into U.S. laws through the Act to Prevent Pollution from Ships and the Hazardous Materials Transportation Act. The U.S. has not ratified Annex IV for sewage, and instead establishes vessel sewage discharge requirements domestically through the Clean Water Act. U.S. vessels engaged in international voyages may demonstrate compliance with Annex IV to the USCG or an Authorized Classification Society to receive a Statement of Voluntary Compliance (in lieu of an ISPCC). Foreign-flagged vessels from Administrations that have ratified Annex IV are subject to both the MARPOL Annex IV requirements and the U.S. domestic requirements for vessel sewage discharges when operating in U.S. waters.

More information on MARPOL Annex IV is available on the IMO's website at https://www.imo.org/en/OurWork/Environment/Pages/Sewage-Default.aspx.

Appendix C: No-Discharge Zone Cost Analysis Tool for CWA Section 312(f)(3) Applications

Overview of Tool

The No-Discharge Zone Cost Analysis Tool (the "Tool") was developed as a standardized but flexible framework for EPA to conduct an analysis of costs related to an (f)(3) no-discharge zone application. On the **Instructions** tab of the Tool, a version number is provided as EPA may develop future versions. Table C-1 summarizes the Tool's content and organization. The Tool is divided into four sections: Tool overview and instructions, Inputs, Outputs, and Supporting calculations.

Table C-1: Cost analysis tool contents

Section	Worksheet	Description
Tool overview and instructions	Instructions	Overview of tool and instructions for use
	Data Dictionary	Description of all required and optional inputs
	Required Inputs	Summary of missing inputs
Inputs	(1) Vessel Inputs	Input table with information on vessel classes operating in the no-discharge zone
	(2) Facility Inputs	Input table with information on existing pumpout facilities serving commercial vessels
	(3) Cost Inputs	Input table with information on baseline and compliance costs
Outputs	Output	Summary of output of screening analysis and cost analysis
Supporting calculations	Demand	Calculation of daily demand for pumpout services by vessel class
	Capacity	Calculation of daily capacity and vessel costs per pumpout at existing pumpout facilities
	Demand Scenario	Calculation of demand and capacity day-by-day, accounting for vessel operating months, pumpout interval, and pumpout facility operating months
	Compliance Costs	Calculation of compliance costs by cost type and vessel class
	Sewage Generation & Pumpout Interval	Default values for sewage generation rate, vessel operating months, number of crew/passengers, % of vessels with holding tank, and pumpout interval
	Pumpout Facility Assumptions	Default values for pumpout facility holding tank capacity and working flow
	Baseline Cost Assumptions	Default values for baseline annual operating costs
	Compliance Cost Assumptions	Default values for inputs to compliance cost calculations
	Bureau of Labor Statistics (BLS) Producer Price Index (PPI)	Producer Price Index for NAICS 483: Water Transportation sector to convert dollar values to 2018 dollars

The Tool overview and instructions section includes an **Instructions** tab, shown in Figure C-1, which explains the purpose of the Tool and how to use it; details the Tool's four sections, required inputs, and color-coding scheme; and briefly discusses the outputs. This section also includes a **Data Dictionary**, which describes all required and optional inputs to the analysis, and a **Required Inputs** table, which

summarizes any missing required inputs. Throughout this section, example screenshots of the Tool will be provided. Refer to the **Data Dictionary** in the Tool itself, as needed, for detailed descriptions of inputs and their meaning.

The next section of the Tool includes the input tables: **(1) Vessel Inputs**, **(2) Facility Inputs**, and **(3) Cost Inputs**. As described in the **Instructions**, input cells in these tables are color-coded: green cells are required inputs, yellow cells are required but have default values that can be selected if the value is unknown, gray cells are optional, and black cells should be left blank. While default values are provided for some of the input cells in these tables, waterbody-specific information should be used whenever possible.

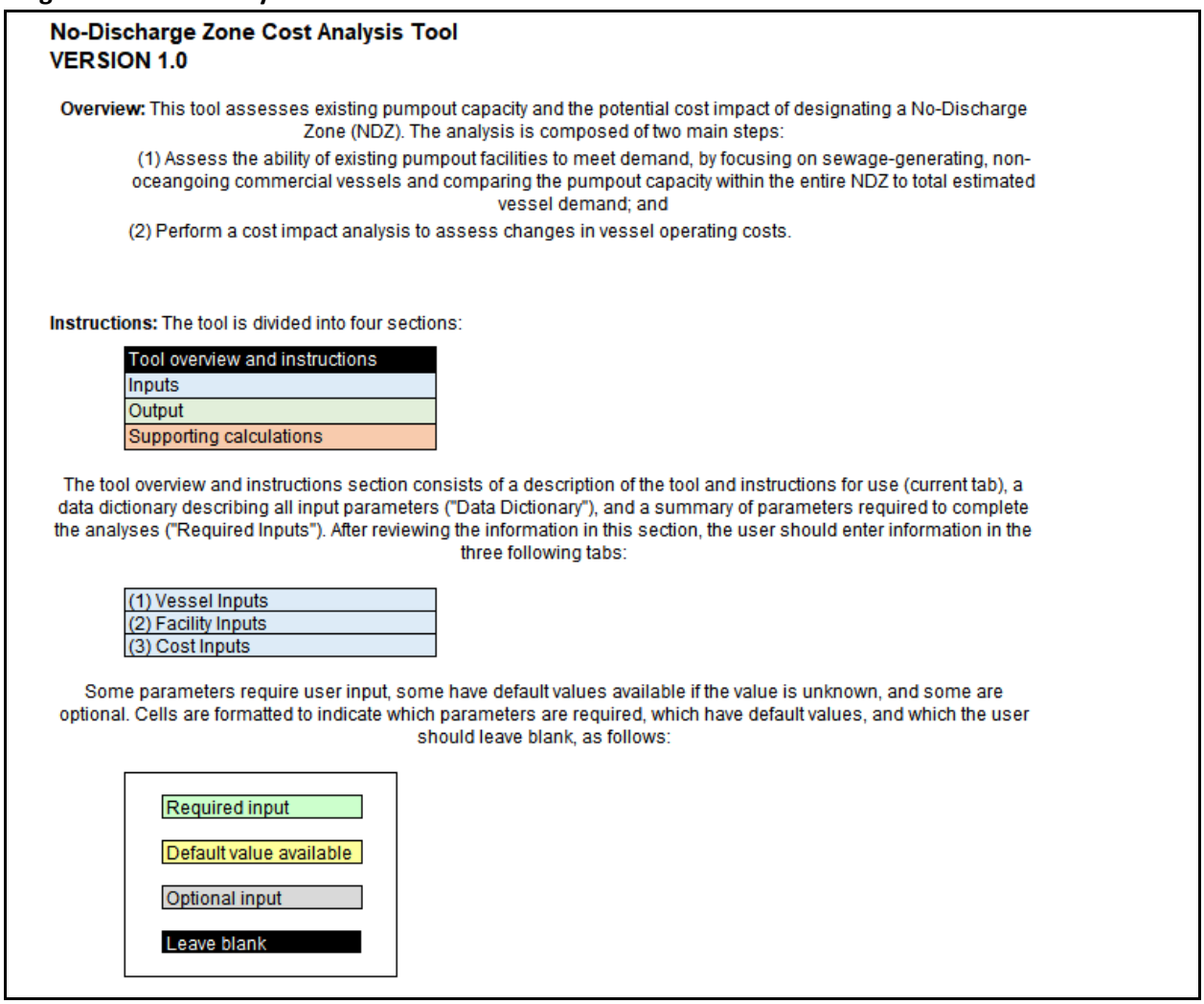
The Output section includes a single **Output** tab that shows the results of the analysis, including (1) whether sufficient capacity exists (Screening Analysis), and (2) the cost analysis.

Finally, the Supporting Calculations section shows background calculations and assumptions used to conduct the analysis.

The Tool focuses on the four vessel classes that EPA expects are most likely to be non-oceangoing commercial vessels: tugboats, ferries, commercial fishing vessels, and excursion vessels (e.g., harbor cruises, whale watching vessels). As described later in this chapter, default values are provided for most inputs for these four required vessel classes. Use of the Tool requires additional inputs for additional vessel classes.

The Tool is intended as a framework for nationwide use by EPA in evaluating (f)(3) applications. As such, the Tool contains default values that are generically appropriate for applications in all waterbodies and therefore does not account for or include scenarios and values for every situation or vessel class. However, the Tool can be tailored to a specific waterbody by replacing default values with available waterbody-specific data. The accuracy of the Tool's outputs is dependent on the specificity and accuracy of the data being inputted into the Tool. EPA's statutory responsibility under CWA Section 312(f)(3) is to determine whether adequate facilities "are" reasonably available for "all" vessels. As such, the Tool assesses the current circumstances in a waterbody and does not model how vessel activity or pumpout facility availability may change in the future with a no-discharge zone designation. Additionally, the Tool is designed to estimate the average cost per vessel within each vessel class, instead of determining the specific cost for each unique vessel within the waterbody.

Figure C-1: Cost analysis tool instructions



No-Discharge Zone Cost Analysis Tool
VERSION 1.0

Overview: This tool assesses existing pumpout capacity and the potential cost impact of designating a No-Discharge Zone (NDZ). The analysis is composed of two main steps:

(1) Assess the ability of existing pumpout facilities to meet demand, by focusing on sewage-generating, non-oceangoing commercial vessels and comparing the pumpout capacity within the entire NDZ to total estimated vessel demand; and

(2) Perform a cost impact analysis to assess changes in vessel operating costs.

Instructions: The tool is divided into four sections:

Tool overview and instructions
Inputs
Output
Supporting calculations

The tool overview and instructions section consists of a description of the tool and instructions for use (current tab), a data dictionary describing all input parameters ("Data Dictionary"), and a summary of parameters required to complete the analyses ("Required Inputs"). After reviewing the information in this section, the user should enter information in the three following tabs:

(1) Vessel Inputs
(2) Facility Inputs
(3) Cost Inputs

Some parameters require user input, some have default values available if the value is unknown, and some are optional. Cells are formatted to indicate which parameters are required, which have default values, and which the user should leave blank, as follows:

Required input
Default value available
Optional input
Leave blank

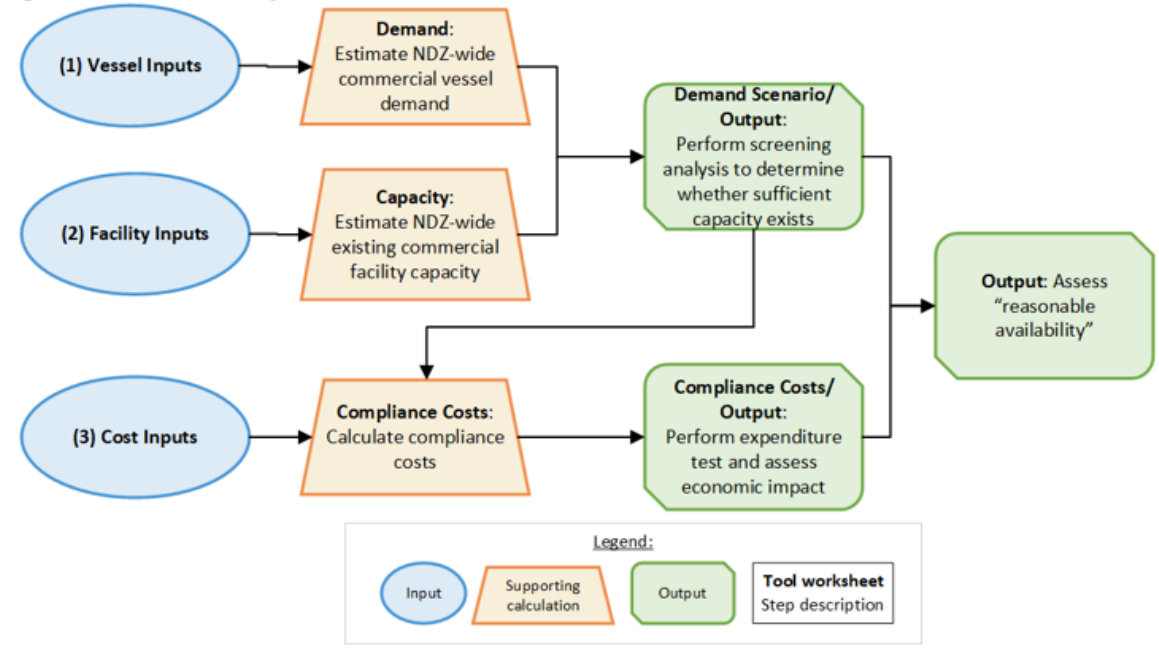
Figure C-1: Cost analysis tool instructions

The descriptions below the tables in the three input tabs refer to Type A and Type B vessel classes. These two vessel classes consist of the following types of vessels:
Type A: Tugboats, Commercial Fishing Boats, Excursion, and Ferries.
Type B: Large Cruise Ships, Ferries with Overnight Accommodations, Cargo Ships, Great Lake Freighters, Off-Shore Vessels, Public Unclassified Vessels, Military Vessels, and Recreational Vessels

The outputs of the analysis are summarized on the "Output" tab. Outputs will not calculate if any required user inputs are missing. If any outputs show "Unknown; user input required," the user should return to the "Required Inputs" tab to identify the missing inputs.

The remaining tabs provide supporting calculations and assumptions. The user may review these tabs for additional detail on the analyses performed in this tool, if desired. However, review of these tabs is not required to use the tool.

Figure 1: Overview of analysis



Description: Figure 1 shows the relationships between each type of input, supporting calculations, and output values. Vessel inputs are used to estimate NDZ-wide commercial vessel demand. Facility inputs are used to estimate NDZ-wide existing commercial facility capacity. Estimates for demand and capacity are then used in a screening analysis to determine whether sufficient capacity exists within the NDZ. Cost inputs, along with the results of the screening analysis, are used to calculate compliance costs. Compliance costs are then used to perform an expenditure test and assess economic impact. The results of the screening analysis and the expenditure test are used to determine whether there is reasonable availability of pumpout facilities.

Analysis Inputs and Supporting Calculations

The analysis is intended to determine if existing pumpout capacity is sufficient to meet expected demand (screening analysis), and the expected increase in baseline operating costs by vessel class (cost analysis). The screening analysis is dependent on vessel demand for pumpout services and the daily capacity of pumpout facilities within the proposed no-discharge zone. The output of the screening analysis informs the cost analysis. The following sections describe the calculations of vessel demand and facility capacity, the screening analysis, and the cost analysis.

The analysis focuses on sewage-generating, commercial vessels operating entirely within the no-discharge zone ("non-oceangoing"). The analysis assumes that if a vessel travels outside the no-discharge zone ("oceangoing"), while it may need to install a holding tank, it will otherwise wait until

leaving the designated no-discharge zone to discharge vessel sewage and therefore will not utilize pumpout facilities. However, EPA will update the Tool to include oceangoing vessels in its assessment of cost for specific applications should the operational characteristics of affected oceangoing vessels warrant inclusion. Additionally, the analysis excludes vessels with dedicated pumpout facilities. The analysis treats all vessels within a given class the same. Though EPA acknowledges that vessel operations and characteristics (e.g., sewage generation rates, pumpout interval) vary between vessels, the analysis is performed by using an "average" vessel within a class. The state may wish to provide more specific information to EPA so that the Tool can be altered to reflect vessels and facilities more accurately in the proposed waterbody.

Vessel Demand

Vessel demand for pumpout services depends on the number and type of vessels operating within the no-discharge zone, the sewage generation of those vessels, and the number of days vessels operate between using pumpout facilities (pumpout interval). Vessel demand tends to vary day-to-day, depending on each vessel class's months of operation and pumpout frequency. Within vessel classes that pump out once or more per day, vessels will utilize pumpout services every day. Within vessel classes that operate for more than one day between pumping out, the number of vessels accessing pumpout facilities on any given day ranges from zero to all vessels within that class. Minimum and maximum daily demand is calculated as follows:

$$\boldsymbol{Minimum\ daily\ demand_{NDZ}\ (gallons\ per\ day)} = \sum_{Vessel\ classes\ with\ pumpout\ interval \leq 1\ day} \left(\frac{Demand_{vessel,class} * number\ of\ vessels_{class}}{pumpout\ interval_{class}} \right)$$

$$\boldsymbol{Maximum\ daily\ demand_{NDZ}\ (gallons\ per\ day)} = \sum_{\boldsymbol{Vessel\ classes\ with\ pumpout\ interval \leq 1\ day}} \left(\frac{\boldsymbol{Demand_{vessel,class} * number\ of\ vessels_{class}}}{\boldsymbol{pumpout\ interval_{class}}} \right) + \sum_{\boldsymbol{Vessel\ classes\ with\ pumpout\ interval > 1\ day}} \left(\boldsymbol{Demand_{vessel,class} * number\ of\ vessels_{class}} \right)$$

where $Demand_{vessel,class}$ is the demand (gallons per day) for pumpout services per vessel by vessel class, $number\ of\ vessels_{class}$ is the number of vessels by vessel class, and $pumpout\ interval_{class}$ is the number of days between pumpout by vessel class.

In the Tool, inputs and calculations related to the analysis of vessel demand can be found in the following worksheets:

- **Vessel Inputs** – user inputs
- **Demand** – details on the calculation of minimum and maximum demand
- **Sewage Gen & Pumpout Int** – vessel input default values

Figure C-2 shows the Tool's **Vessel Inputs** table, and Table C-2 summarizes the required and default inputs necessary to estimate total daily vessel demand for pumpout services. Default values are provided for all vessel inputs for the four default vessel classes, except for the number of vessels operating. As needed, additional vessel classes (or subsets of the same class) can be added to the analysis.

Figure C-2: Vessel Inputs

Vessel Inputs

Instructions:

Fill out this table for all non-oceangoing, sewage-generating commercial vessels. All green cells are required and black cells do not need to be filled in. Yellow cells contain default values; enter a different value if known. To return to the default value, select the default value from the drop down menu. Do not leave yellow or green cells blank. Select the header for more information about that input, or refer to the Data Dictionary.

Vessel Class	Number Operating in Potential NDZ	Operating months start date (month and day)	Operating months end date (month and day)	Secondary operating months start date (month and day)	Secondary operating months end date (month and day)	Average number of crew and passengers per vessel	Sewage generation rate (gallons per person per day (g/p/d))	Pumpout interval (number of days between pumpout)	Average distance traveled (nautical miles)	Percent of vessels with holding tank installed	Buffer time when pumping out (minutes)
Tugboats	100	8-Jan	23-Dec			6	11	7.5	0	0%	0
Commercial Fishing Vessels	50	15-May	17-Aug			7	11	2.0	0	0%	15
Excursion	75	5-Apr	26-Sep			187	8	0.5	0	44%	10
Ferries	25	5-Apr	26-Sep			282	7	0.5	0	85%	5
Required	*Required*	*Default value available*	*Default value available*	*If not applicable leave blank*	*If not applicable leave blank*	*Default value available*	*Default value available*	*Default value available for Type A vessel classes. Input required for Type B*	*Default value available*	*Default value available*	*Required*

To add a new vessel class to the table, please click "Add Row" (or "Ctrl + e") --> Add Row

To remove a user-added vessel class from the table, please select any cell in the row you wish to remove, then click "Delete Row" (or "Ctrl + f") --> Delete Row

Table C-2: Required and default vessel inputs		
Vessel Class	**Input**	**Source/Assumptions**
All vessel classes	Number of vessels operating in no-discharge zone	Input required (no default value provided)
	Operating months (start and end date)	Based on the national average number of days each vessel class operates per year, centralized to the middle of the year (U.S. EPA, see Appendix E)
	Secondary operating months (start and end date)	Optional input. If applicable, input required (no default value provided)
	Average number of crew and passengers per vessel	Based on national average data (U.S. EPA, see Appendix E)[4]
	Sewage generation rate	Based on national average data (U.S. EPA, see Appendix E)
	Average distance traveled	Zero, based on assumption that pumpout facilities are co-located with fueling stations
	Percent of vessels with a holding tank installed	Based on national average data (U.S. EPA, see Appendix E)
	Buffer time	Input required (no default value provided)
Tugboats, ferries, commercial fishing vessels, and excursion vessels only	Pumpout interval (number of days between pumpout)	1-14 days for tugboats (American Waterways Operators, 2014), 1-7 days for ferries (Maine Department of Transportation, 2018; Whatcom County, WA, 2019), 1-3 days for commercial fishing vessels (Herrera Environmental Consultants, 2013), and 1-7 days for excursion vessels;[a] average pumpout interval is applied as the default value
All vessel classes except tugboats, ferries, commercial fishing vessels, and excursion vessels	Pumpout interval (number of days between pumpout)	Input required (no default value provided)

Note: Green inputs are required; yellow inputs have default values available.
a. In the absence of more specific information, EPA applied the estimates for ferries to excursion vessels.

[4] For military vessels, the default value for "average number of crew and passengers per vessel" will not be used for purposes of calculations due to the large variability in crew sizes. The value will be updated based on vessel characteristics in a given waterbody.

Facility Capacity

Existing pumpout facility capacity in the no-discharge zone is dependent on the capacity and days of operation of all existing pumpout facilities available for use by commercial vessels, including any that are also available for use by recreational vessels. Because individual pumpout facilities maintain different days and hours of operation, including some seasonal closures, pumpout capacity varies day-to-day. The daily capacity within a no-discharge zone will be, at least, the total daily capacity of all facilities that operate every day and, at most, the total daily capacity of all facilities in the no-discharge zone:

$$\boldsymbol{Minimum\ daily\ capacity_{NDZ}}\ (\boldsymbol{gallons\ per\ day}) = \sum_{facilities\ that\ operate\ every\ day} Daily\ capacity_{fac}$$

$$\boldsymbol{Maximum\ daily\ capacity_{NDZ}}\ (\boldsymbol{gallons\ per\ day}) = \sum_{all\ facilities} Daily\ capacity_{fac}$$

In the Tool, inputs and calculations related to the analysis of facility capacity can be found in the following worksheets:

- **Facility Inputs** – user inputs
- **Capacity** – details on the calculation of minimum and maximum capacity
- **Pumpout Fac Assumptions** – vessel input default values

Figure C-3 shows the Tool's **Facility Inputs** table, and Table C-3 summarizes the facility inputs needed to estimate the total daily capacity of existing commercial pumpout facilities, and the costs associated with vessels using those facilities. Default values are provided for tank capacity, and total working flow.

Figure C-3: Facility Inputs

Facility Inputs

Instructions:

Enter information for all pumpout facilities, including pumpout boats, barges, and trucks, that serve commercial vessels. All green cells are required and black cells do not need to be filled in. Yellow cells contain default values; enter a different value if known. To return to the default value, select the default value from the drop down menu. Do not leave yellow or green cells blank. Gray cells are optional values. Select the header for more information about that input, or refer to the Data Dictionary.

Facility Name	Facility Type	Number of hours of operation per day	Days per week in operation	Opening month (if facility operates year-round, enter 1)	Closing month (if facility operates year-round, enter 12)	Connection to sewer?	Tank Capacity (gallons)	Total working flow (gpm)	Base/Service Fee	Base Gallons	Fee ($/gallon)	Fee ($/hour)
Pumpout Facility #1	Stationary	16	7	1	12	Yes		88			$0.50	
Pumpout Facility #2	Truck	8	7	1	12	No	5,000	88	$20.00	0	$0.20	
Pumpout Facility #3	Boat	12	5	1	12	No	620	88	$20.00	0	$0.20	
Pumpout Facility #4	Barge	16	5	1	12	No	200	88				$30.00
Required	*Required*	*Required*	*Required*	*Required*	*Required*	*Required*	*If "Connection is sewer?" is yes, leave blank. If "Connection is sewer?" is no, then default value is available.*	*Default value available*	*A base fee, a fee in dollars per gallon, or a fee in dollars per hour is required.*	*If there is no Base/Service fee, then leave blank. If there is a Base/Service fee, then input is required.*	*A base fee, a fee in dollars per gallon, or a fee in dollars per hour is required.*	*A base fee, a fee in dollars per gallon, or a fee in dollars per hour is required.*

To add a row to the end of the table, please click "Add Row" (or "Ctrl + y") --> Add Row

To remove a row from the table, please select any cell in the row you wish to remove, then click "Delete Row" (or "Ctrl + d") --> Delete Row

Table C-3: Required and default facility inputs

Facility	Input	Source/Assumptions
All facilities	Facility type	Input required (stationary, truck, boat, or barge)
	Number of hours of operation per day	Input required
	Days per week in operation	Input required
	Opening and closing month	Input required
	Connection to sewer	Input required
	Tank capacity	Boats: 240 gallons to 1,000 gallons (average of 620 gallons) (New Jersey Institute of Technology, 2012); Trucks: 5,000 gallons (Brown and Caldwell, 2007); Barges: 80,000 to 280,000 gallons (average of 180,000 gallons) (City of Boston Environmental Department et al., 2008); Stationary: 5,000 gallons[a]
	Total working flow	EPA assumes that commercial facilities would use a vacuum system with working flow rate ranging between 75 and 100 gpm (average of 88 gpm) (Alaska Clean Harbors; Keco Pump and Equipment)
	Facility fee (base/service fee and associated gallons, fee per gallon, and/or fee per hour)	Input required for at least one fee type

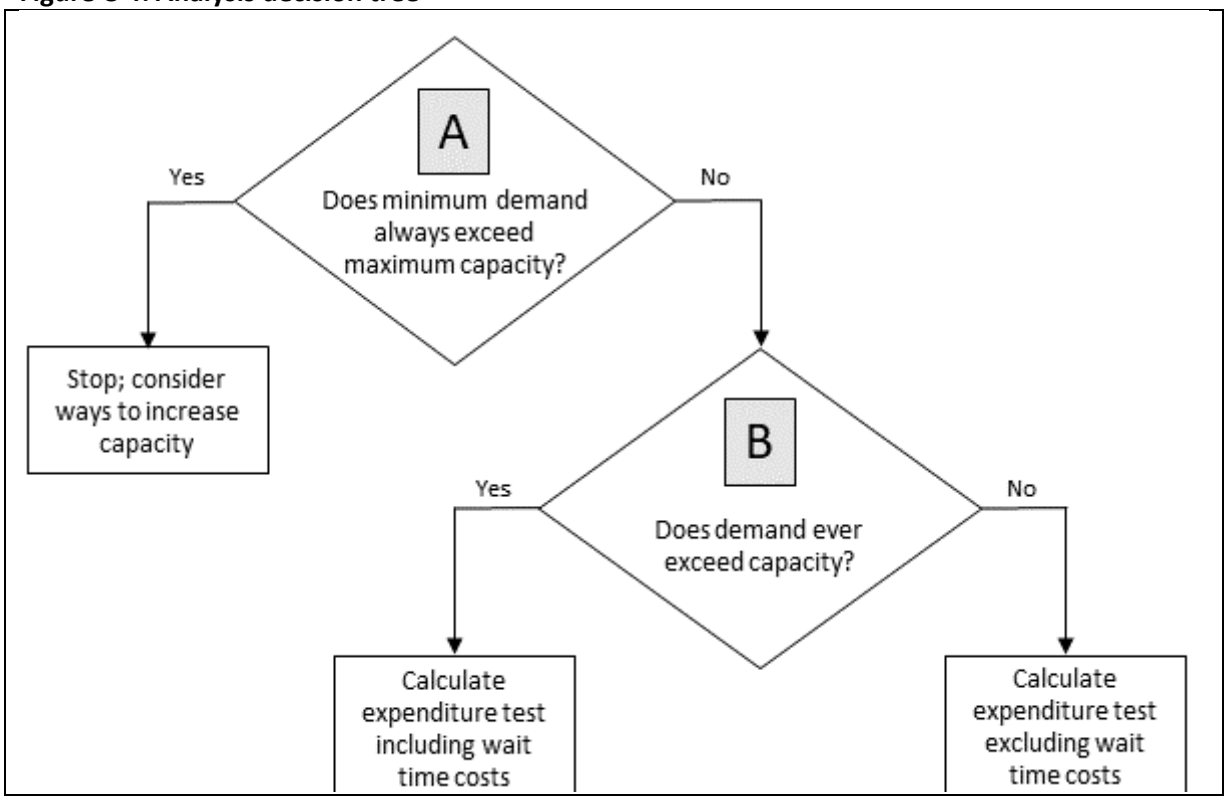
Note: Green inputs are required; yellow inputs have default values available.

a. EPA assumes that the average holding tank capacity for stationary commercial pumpout facilities is equal to the average pumpout truck capacity (5,000 gallons).

Screening Analysis

The screening analysis compares the estimated minimum and maximum vessel demand and facility capacity. The key decision points are summarized in Figure C-4 and described further below.

Figure C-4: Analysis decision tree

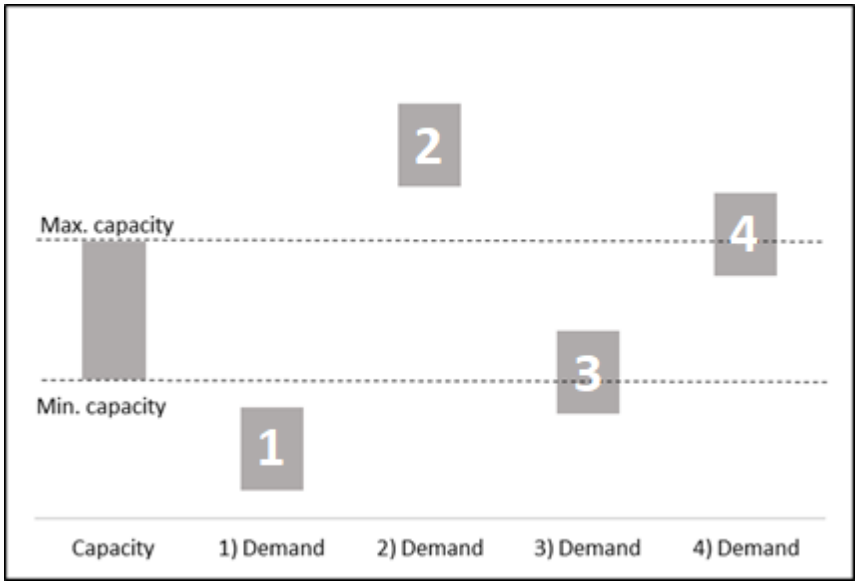


The screening analysis compares pumpout capacity at existing commercial pumpout facilities to expected commercial vessel demand for pumpout services. The daily pumpout capacity varies by month and day, as facilities may not operate year-round or seven days per week. Daily vessel demand also varies day-to-day, depending on operating months and how many vessels utilize pumpout services each day. As described previously, the methodology implemented in the Tool estimates the minimum and maximum vessel demand and minimum and maximum daily facility capacity, which reflect:

- Minimum capacity – reflects the day and month in which the fewest/smallest facilities are operating
- Maximum capacity – reflects the day/month in which the most/largest facilities are operating
- Minimum demand – reflects the daily demand from vessels utilizing pumpout facilities every day during their operating months
- Maximum demand – reflects the daily demand from all vessels operating in the no-discharge zone

The screening analysis first compares minimum and maximum demand and capacity to determine if sufficient capacity exists within the proposed no-discharge zone. When comparing minimum and maximum capacity and demand, one of four conditions will hold, as illustrated in Figure C-5.

Figure C-5: Annual Capacity and Demand Conditions



Condition 1: Pumpout capacity always meets demand. When the fewest/smallest facilities are operating, pumpout facilities can still receive the total volume of sewage requiring pumpout.

Condition 2: Demand always exceeds pumpout capacity. Regardless of the number of vessels operating, pumpout facilities cannot receive the total volume of sewage requiring pumpout.

Condition 3: Pumpout capacity usually meets demand. On days when the fewest/smallest facilities are operating, the total volume of sewage requiring pumpout may sometimes exceed capacity.

Condition 4: Pumpout capacity usually meets demand. On days when a large percentage of vessels are operating, the total volume of sewage requiring pumpout may sometimes exceed capacity.

If condition two is met, where capacity is shown to be insufficient to meet minimum expected demand, EPA may request the state consider methods of increasing facility capacity prior to proceeding with the no-discharge zone application. If any other condition is met, EPA continues with the cost analysis, with additional analytical considerations factoring into the analysis under conditions three and four. This is represented by decision point A in Figure C-4.

Under conditions three and four, where the range of demand estimates overlaps with the range of capacity estimates, it is possible for demand on a given day to exceed existing capacity, and vessels may need to wait or travel further for available pumpout facilities. To understand the likelihood that this would occur, the Tool evaluates a uniform demand scenario based on each vessel class's months of operation and pumpout interval. Under a uniform demand scenario, the same number of vessels pump out every day within each class. For example, if ferries are expected to pump out every 4 days, then $1/4^{th}$ of ferries would pump out each day during ferry operating months. It is in the best interest of vessels to minimize costs, and by spreading out demand, vessels can reduce the wait time to access a pumpout facility. This scenario is possible given that many vessels can schedule a pumpout ahead of time at a facility.

The uniform demand scenario analysis estimates demand and capacity for one year, on a day-by-day basis, and assesses whether capacity is greater than or less than expected demand each day. The fraction of days where capacity is less than demand informs the cost analysis and is represented by decision point B in Figure C-4. Details on the calculations and data involved in the uniform demand scenario analysis can be found in the **Demand Scenario** tab in the Tool.

Cost Analysis

A no-discharge zone designation may impose costs on owners/operators of sewage-generating commercial vessels. EPA summarizes these compliance costs into four categories: pumpout facility use costs, pumpout time costs, travel costs, and wait time costs. The cost analysis calculates the percentage increase in operating costs vessels may experience as a result of the no-discharge zone designation (expenditure test), to assess economic impact. The cost inputs include only those that may vary based on whether adequate facilities are available in the proposed waterbody. The expenditure test characterizes the overall increase in costs that vessels may experience as a result of the no-discharge zone designation, relative to their operating costs prior to the designation. EPA would use this value as an additional factor to consider in weighing whether adequate pumpout facilities are reasonably available in the proposed waters.

$$Expenditure\ test = \frac{Total\ annual\ compliance\ costs}{baseline\ annual\ operating\ costs}$$

where,

$$Total\ annual\ compliance\ costs = facility\ use\ costs + pumpout\ time\ costs + travel\ costs + wait\ time\ costs$$

The analysis assumes that vessels would incur wait time costs only on days where minimum capacity does not meet demand, so wait time costs depend on the output from the uniform demand scenario analysis. On these days, the analysis assumes that each vessel would have to wait for one other vessel to pump out ahead of it. The average wait time is determined using the weighted average time to pump out, weighted by the number of vessels in each class. The Tool calculates the annual lost revenue due to waiting to pumpout when access to pumpout facilities is constrained due to high demand.

Annual compliance costs account for buffer time, based on the user input in the **Vessel Inputs** tab. Buffer time represents the additional time associated with pumping out other than the time spent actively pumping. This could include time for activities such as positioning the vessel or hooking up the pumpout equipment to the vessel. Thus, the analysis considers the total time needed to complete a pumpout, including any wait time, buffer time, and time spent actively pumping out. If a facility charges a fee per hour, the analysis assumes that vessels will be charged for the buffer time as well.

In calculating average facility use costs by vessel class, the analysis considers only pumpout facilities that either (1) are connected directly to a sewer system, or (2) have a tank with a capacity that exceeds the average sewage pumpout volume for a single vessel in that vessel class. This is done so that the average facility use cost is representative of facilities that could service that vessel class.

In the Tool, inputs and calculations related to the cost analysis can be found in the following worksheets:

- **Vessel Inputs** – buffer time input

- **Cost Inputs** – user inputs
- **Compliance Costs** – details on the calculations of baseline and compliance costs
- **Bsln Cost Assumptions** – baseline cost input default values
- **Compliance Cost Assumptions** – compliance cost input default values

Figure C-6 shows the Tool's **Cost Inputs** table, and Table C-4 summarizes the **Cost Inputs** needed to conduct the cost analysis. Default values are provided for all cost inputs for tugboats, commercial fishing vessels, excursion vessels, and ferries. For other, user-added vessel classes, a default value is only available for fuel price.

Figure C-6: Cost Inputs

Cost Inputs

Instructions:

Enter information for inputs to the cost analysis. Green cells are required. Yellow cells contain default values; enter a different value if known. To return to the default value, select the default value from the drop down menu. Do not leave cells blank. Select the header for more information about that input, or refer to the Data Dictionary.

Vessel Type	Annual baseline operating costs ($/vessel)	Vessel speed (nautical miles per hour)	Fuel consumption (gallons per hour)	Hourly revenue ($/hour/vessel)	Fuel price ($/gallon)
Tugboats	$2,261,126	11.75	98.2	$1,300	$2.26
Commercial Fishing Vessels	$377,893	13.00	30.1	$1,758	$2.26
Excursion	$1,884,944	30.50	82.7	$1,300	$2.26
Ferries	$1,884,944	13.67	82.7	$1,267	$2.26
	Default value available for Type A vessel classes. Input required for Type B vessel classes.	*Default value available for Type A vessel classes. Input required for Type B vessel classes.*	*Default value available for Type A vessel classes. Input required for Type B vessel classes.*	*Default value available for Type A vessel classes. Input required for Type B vessel classes.*	*Default value available*

Table C-4: Required and default cost inputs		
Vessel Class	**Input**	**Source/Assumptions**
Tugboats, ferries, commercial fishing vessels, and excursion vessels only	Annual baseline operating costs	Ferries: average cost based on State of Washington Joint Transportation Committee (2006) cost analysis, U.S. Department of Transportation (2011a; 2011b) Ferry Lifecycle Cost Model, records for a Skagit County, Washington ferry (Skagit County, WA, 2019), Baltimore City Department of Transportation study (Whitman, Requardt, & Associates, 2015), Cape Lookout National Seashore Passenger Ferry Transportation Study (U.S. DOI, 2010), financial feasibility study for Contra Costa County ferry (Economic & Planning Systems, 2015), Hillsborough Metropolitan Planning Organization feasibility study of Tampa Bay ferry (Cambridge Systematics, 2011), Solano Transportation Authority feasibility study of Solano County, CA ferry (Economic & Planning Systems, 2019), records for a Whatcom County, Washington ferry (Whatcom County Public Works, 2018), and City of Portland ferry feasibility study (Nelson Nygaard Consulting Associates, 2006); Tugboats: average cost based on Department of Civil Works memorandum (U.S. Army Corps of Engineers, 2004) and Alaska Deep Draft Arctic Port System Feasibility Study (U.S. Army Corps of Engineers, 2015); Commercial fishing vessels: Valdez Harbor Expansion Feasibility Study (U.S. Army Corps of Engineers, 2010); Excursion vessels:[a] see sources for ferries
	Vessel speed	Ferries: 2016 National Census of Ferry Operators Typical Speed (U.S. Department of Transportation, Bureau of Transportation Statistics 2016); Tugboats: vessel speeds reported by Weeks Marine (Weeks Marine, 2019); Commercial fishing: based on the cruising speed of a tuna purse seiner (Mauric Sea Novators); Excursion vessels: based on the average speed of two whale watching vessels (Boston Harbor Cruises)
	Fuel consumption	Average fuel usage in gallons per hour estimated by dividing horsepower by 10 (Lee, 2013); Average horsepower based on a review of California commercial harbor craft (South Coast Air Quality Management District, 2015)
	Hourly revenue	Ferries and excursion vessels[a]: based on the Washington State ferry fleet (San Juan County); Tugboats: based on an estimate from the 2015 Technical Memorandum by Herrera (Herrera Environmental Consultants 2015); Commercial fishing: calculated using commercial fishing revenue and catch volume data for the Pacific (Pacific Fisheries Information Network, 2019) and Atlantic (ACCSP, 2019) coasts. EPA determined an average dollar of revenue per megaton (mt) of catch, multiplied by the average capacity of a fishing vessel, and determined an average hourly revenue estimate.
	Fuel price	U.S. Energy Information Administration 2018 price per gallon for No. 2 diesel fuel (Energy Information Administration, 2019)
All vessel classes except tugboats, ferries, commercial fishing vessels, and excursion vessels	Annual baseline operating costs	Input required
	Vessel speed	Input required
	Fuel consumption	Input required
	Hourly revenue	Input required
	Fuel price	U.S. Energy Information Administration 2018 price per gallon for No. 2 diesel fuel (Energy Information Administration, 2019)

Note: Green inputs are required; yellow inputs have default values available.

a. In the absence of more specific information, EPA applied the estimates for ferries to excursion vessels.

Output

As illustrated in Figure C-4, the Screening Analysis assists EPA in better understanding how the range of estimated capacity at existing pumpout facilities compares to the range of estimated vessel demand over a given year. Using that information, the Tool performs a cost analysis to determine the extent to which operators would incur costs. The output of these analyses is summarized below, as well as in the **Output** tab of the Tool.

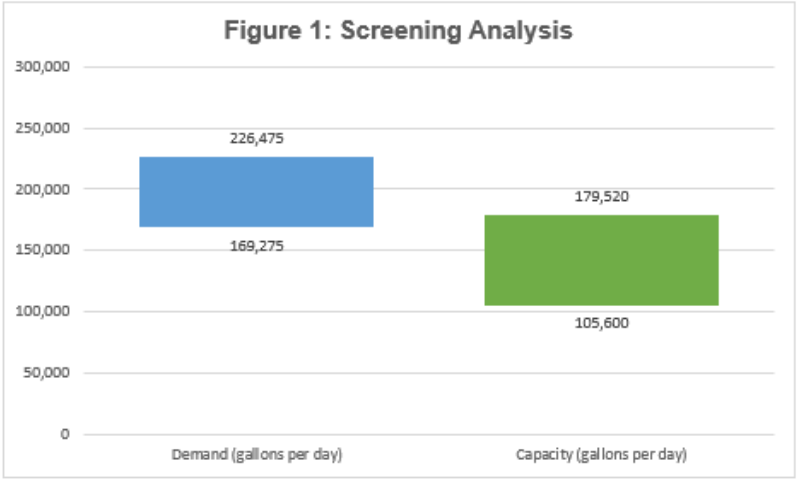
The first step of the screening analysis compares minimum and maximum demand and capacity within the proposed no-discharge zone. As described previously, if the capacity is likely insufficient to meet a minimum estimation of demand (condition 2), EPA may recommend that the state consider methods of increasing facility capacity prior to proceeding with the no-discharge zone application. In all other cases, EPA would proceed with a cost analysis.

Figure C-7 shows an example output from the screening analysis, as reported on the **Output** tab. The table shows the minimum and maximum demand and capacity within the proposed no-discharge zone, and the figure illustrates the comparison of demand to capacity. In this example, on an annual basis the volume of sewage needing to be pumped out on a given day is expected to range between approximately 169,000 gallons and 226,000 gallons. Pumpout facilities, on the other hand, are expected to be able to receive between 106,000 and 180,000 gallons per day. As such, there is overlap between demand and capacity (condition 4). In this example, vessels may need to wait to access a pumpout facility or may choose to travel further to an available facility.

Figure C-7: Example screening analysis output

Table 1: Minimum and maximum demand and capacity

Item	Total - minimum	Total - maximum	Difference
Demand (gallons per day)	169,275	226,475	57,200
Capacity (gallons per day)	105,600	179,520	73,920



Description: *Figure 1 presents the results from Table 1 to compare the demand, in gallons per day, to the capacity, in gallons per day, in the NDZ.*

The second step of the screening analysis assesses demand and capacity on a day-by-day basis assuming a uniform demand scenario. If the percent of days where minimum capacity meets demand is less than 100 percent, then vessels will incur additional costs, namely wait time costs, on days where demand is

not met by minimum capacity. This calculation determines the frequency that EPA expects a vessel to wait to pump out. Figure C-8 shows example results of the uniform demand scenario, as presented in the **Output** tab. The percent of days where minimum capacity meets demand is the key output, as it affects the calculation of wait time costs in the cost analysis.

Figure C-8: Example uniform demand scenario output

Table 2: Uniform demand scenario

Item	Value
Minimum daily demand (gallons per day)	0
Maximum daily demand (gallons per day)	179,313
% of days where min. capacity meets demand	52%
% of days where max. capacity meets demand	100%

Finally, the cost analysis calculates annual baseline and compliance costs (facility use, travel costs, pumpout time costs, and wait time costs) and performs an expenditure test to estimate the percentage increase in operating costs resulting from a no-discharge zone designation. Figure C-9 shows example output from the cost analysis, as reported in the **Output** tab. The table summarizes the costs per year per vessel for each vessel class and presents the percent increase in operating costs per vessel. The figure provides an illustration of the expenditure test findings, also reported in the table.

The number of vessels impacted in each class depends on the percentage of vessels that already have holding tanks installed in the baseline. Vessels that have holding tanks installed prior to a no-discharge zone designation will not incur all compliance costs due to the designation of a no-discharge zone since such vessels are already experiencing these costs in the baseline. Consequently, the Tool presents the expenditure test results separately for vessels with a holding tank installed and vessels without a holding tank installed. Vessels with a holding tank installed would only incur travel costs and wait time costs. Therefore, if pumpout facilities are co-located with fueling stations, as the Tool assumes as the default, and if the uniform demand scenario analysis indicates that vessels would not incur wait time costs, then the expenditure test for vessels with a holding tank already installed would be zero.

Figure C-9: Example cost analysis output

(2) Cost Analysis

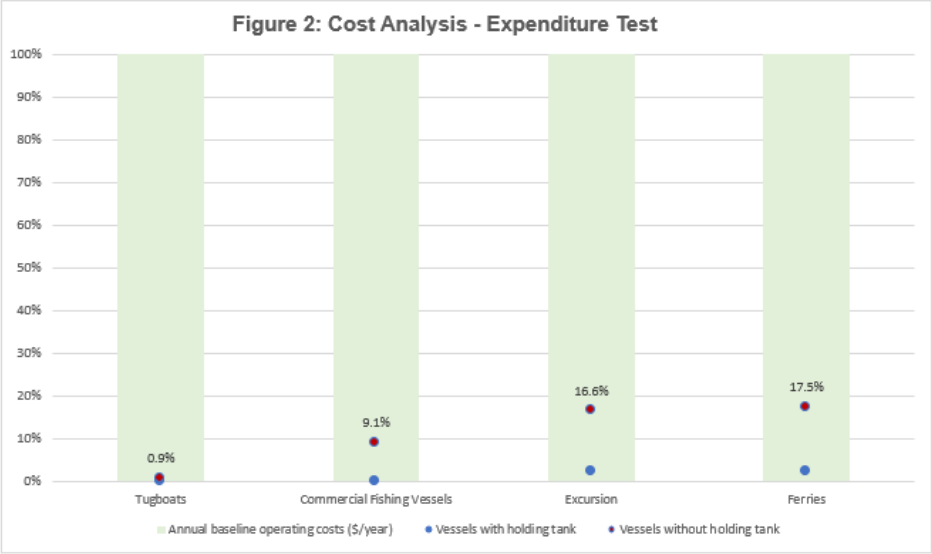
An NDZ designation may impose costs on owners/operators of sewage-generating commercial vessels. Table 3, below, summarizes these costs per vessel by cost category for each vessel class. The expenditure test evaluates the percentage increase in baseline operating costs due to the NDZ designation. Figures 2 graphically depicts the results of the expenditure test for each vessel class. The number of vessels in each class incurring the full set of compliance costs is dependent on the percent of vessels that already have a holding tank.

Table 3: Cost analysis ($2018)

Vessel Class	Tugboats	Commercial Fishing Vessels	Excursion	Ferries
Total number of vessels	100	50	75	25
Number of vessels w/ holding tanks	0	0	33	21
Number of vessels w/o holding tanks	100	50	42	4
Annual baseline operating costs ($/year)	$2,261,126	$377,893	$1,884,944	$1,884,944
Annual facility use costs ($/year)	$9,270	$2,524	$122,352	$159,912
Annual travel costs - fuel ($/year)	$0	$0	$0	$0
Annual travel costs - lost revenue ($/year)	$0	$0	$0	$0
Annual pumpout time costs - lost revenue ($/year)	$5,704	$23,305	$143,515	$123,419
Annual wait time costs - lost revenue ($/year)	$6,258	$8,588	$46,805	$45,623
Total annualized compliance costs ($/year)	$21,232	$34,417	$312,671	$328,954
Expenditure test - vessels w/ holding tank			2.5%	2.4%
Expenditure test - vessels w/o holding tank	0.9%	9.1%	16.6%	17.5%

The Expenditure Test *compares incremental costs attributable to the NDZ to annual baseline operating costs. Total annualized compliance costs equal:*

- Wait time costs, for vessels with a holding tank already installed in the baseline.
- Facility use costs, travel costs, pumpout time costs, and wait time costs, for vessels without a holding tank installed in the baseline.



Description: *Figure 2 presents results from Table 2 to illustrate, for each vessel class, the percentage increase in baseline operating costs due to the NDZ designation. The percentage increase is shown for vessels with and without holding tanks. Annual baseline operating costs, in dollars per year, are also included for each vessel class.*

Appendix D: Strategies to Achieve Compliance (Public Outreach and Enforcement)

Although not a required part of the application process, during its consideration of whether to pursue a no-discharge zone designation, the state may wish to consider how it would implement the no-discharge zone, should the application be approved. This section is informational only and provides recommendations for achieving compliance, with a focus on two integral components: public outreach and enforcement.

Public Outreach and Education

Public outreach campaigns that educate the public about vessel sewage play an important role in increasing voluntary compliance with no-discharge zones. Community understanding and voluntary compliance are crucial when scare resources and competing priorities limit enforcement agencies' abilities to undertake active enforcement efforts.

In developing an outreach strategy, the state should consider the following aspects:

- Goal of the campaign;
- Audience;
- Message and purpose of the outreach material;
- Public outreach tools; and
- Budget considerations.

Goal of the campaign: Communities with a no-discharge zone will likely enact a public outreach campaign with the goals of increasing compliance with vessel sewage regulations and increasing awareness of the environmental impacts of improper sewage disposal. There may be additional secondary goals, such as increasing support for additional sewage pumpout facilities.

Audience: Audiences for an outreach campaign about no-discharge zone compliance are likely to include boaters, waterfront facility owners or operators, and Publicly Owned Treatment Works (POTWs). Each of these groups plays an important role in ensuring proper vessel sewage disposal. Boaters need to comply with sewage regulations, facility owners need to ensure pumpout facilities are available and operable, and POTWs need to accept vessel sewage for treatment.

Message and Purpose: Public outreach products will be developed for each audience segment with a certain purpose and message in mind. Common categories of messages include:

- *Motivate.* These messages convince audience members to take a certain action, such as using pumpout facilities to empty their holding tanks. Different audiences will be compelled to act for different reasons. For example, recreational fishers may be motivated to properly dispose of sewage if they learn this will protect the local ecosystem and result in a healthier fish population. Other groups may be more motivated by improvements to human health or concerns about ease or cost of pumping out. It is important to connect to what your audience member cares about.
- *Inform.* Informational messages provide knowledge that facilitates compliance with no-discharge zones. For example, outreach material may provide maps of where pumpout facilities are located.
- *Instruct*. These messages teach audiences how to take certain actions to comply with no-discharge

zones. An example is a guide on how to use a pumpout facility.

Public Outreach Tools: Below are examples of different tools and products that can be used to communicate with the target audience.

- Printed materials (manuals, fact sheets, brochures, flyers, packets).
- Visual materials (videos, placards, posters, display booths).
- Novelties (stickers, magnets, buttons, clothing).
- Formal media (public service announcements, press releases, industry publications).
- Social media

When creating public outreach products, it is important to consider what tool will be most effective in communicating a certain message to a certain audience. The following table provides examples of the purpose of public outreach activities for boaters, waterfront facility owners/operators, and POTWs.

Table D-1: Matching Audience with Message

Target Audience	Problem/Role in Issue	Potential Purpose/Message
Boaters	Low compliance with existing MSD regulations	• Consequences of vessel sewage discharges • Locational of pumpout facilities • MSD regulations
Waterfront Facility Owners/Operators	Inadequate pumpout capacity at facility	• Impacts of vessel sewage discharges • Description of types of pumpout facilities • Need for improved pumpout capacity/availability
Wastewater Treatment Facilities	Reluctance to accept vessel sewage	• Awareness of issue/solution • Cooperation in accepting vessel sewage

Budget Considerations: First, create a consistent theme, including text and graphics, that can be reused for multiple products to lower design costs. Having consistency across products will also create cohesion throughout the campaign and make it more recognizable to the public. Other factors that may affect costs include the size of products, the number of colors used for printed products, the number of units printed, and the distribution strategy.

In summary, a successful public outreach campaign combines the message selected for the targeted audience with the appropriate public outreach tool. Budget considerations affect the number of messages and tools which can be used.

Enforcement

Per CWA Section 312(k), the USCG and states are the primary enforcement authorities for vessel sewage regulations.

"This section shall be enforced by the Secretary of the department in which the Coast Guard is operating, who may use, by agreement, with or without reimbursement, law enforcement officers or other personnel and facilities of the Administrator, other Federal agencies, or the States to carry out the provisions of this section." 33 U.S.C. 1322(k)(2)(A)

"This section may be enforced by a State or political subdivision of a State (including the attorney general of a State)…" 33 U.S.C. 1322(k)(3)(A)

Examples of techniques used to enforce no-discharge zones include:

- *Dye tablets*. Fluorescent dye tablets are sometimes placed in the holding tanks and marine heads of moored vessels in a no-discharge zone. If an illegal discharge occurs within the no-discharge zone, the effluent is easily identifiable.
- *Sealing the Y-valve*. The Y-valve, which allows direct overboard discharges, is sometimes required to be sealed in a closed position when the vessel is in a no-discharge zone.
- *Condition of mooring and slip rental*. Waterfront facilities located in a no-discharge zone sometimes require the use of pumpout facilities as a condition of mooring or slip rental.
- *Vessel boarding*. Some waterfront facilities may require vessel owners to allow boarding as a requirement for docking or mooring.
- *Water quality monitoring*. In some areas, water quality monitoring is conducted during heavy boating weekends to monitor compliance.
- *Presence of law enforcement officials*. In some areas, enforcement officials patrol for violators in no-discharge zones.

Even with enforcement techniques, it is recommended that the state develop an effective public outreach effort to promote voluntary compliance with a no-discharge zone.

Appendix E: Definitions and Sources of EPA Vessel Information

The contents of this Appendix include definitions and source information for data used within the No-Discharge Zone Cost Analysis Tool.

The Vessel General Permit (VGP) eNOI database referenced in this section is EPA's database for all vessels that have submitted a Notice of Intent, Notice of Termination, or annual report under EPA's 2013 Vessel General Permit. In instances where the database was queried, entries were not included: (1) if a Notice of Termination was submitted for the vessel, or (2) if the vessel did not visit US ports.

[a] Large cruise ships

A large cruise ship is defined in Part 5.1 of the Vessel General Permit (VGP) as a passenger ship, used commercially for pleasure cruises, that provides overnight accommodations to passengers, and is authorized by the Coast Guard to carry 500 or more passengers. Vessel numbers were estimated using the VGP eNOI database to search for "large cruise ship (500+ passengers)". This analysis assumes 54% of large cruise ships have advanced wastewater treatment systems (sophisticated Type II MSDs) based on the Friends of the Earth (2016) "Cruise Ship Report Card." Average number of passengers/crew was also obtained from the "Cruise Ship Report Card" for vessels entering U.S. waters only. Number of days operating in U.S. waters was calculated based on 31 cruise ships in Alaska from May through September assumed operating in U.S. waters 60% of the time, and 17 additional cruise ships operating in U.S. waters other than Alaska 2 days per week and 52 weeks per year. Sewage generation rate was obtained from U.S. EPA's 2008 "Cruise Ship Discharge Assessment Report."

[b] Medium and small cruise ships (excursion vessels)

A medium cruise ship is defined in Part 7 of the VGP as a passenger ship, used commercially for pleasure cruises, that provides overnight accommodations to passengers, and is authorized by the Coast Guard to carry 100 to 499 passengers. Vessel numbers were estimated using the VGP eNOI database to search for "medium cruise ships (100-499 passengers)". This analysis assumes 45% of small cruise ships have advanced wastewater treatment systems (sophisticated Type II MSDs), based on the Friends of the Earth (2016) "Cruise Ship Report Card." Number of days operating in U.S. waters was estimated from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits." Average number of passengers/crew from information provided by 23 medium/small cruise ships. Sewage generation rate was considered comparable to large cruise ships and was transferred from there.

[c] Passenger ferries with overnight accommodations

Passenger ferries with overnight accommodations were characterized by looking at five Alaska Marine Highway ferries and one Great Lakes ferry. The Great Lakes ferry (Badger) uses a Type III MSD, and the remainder use Type II MSDs (Lake Carriers' Association comment (EPA-HQ-OW-2010-0126-0040) on U.S. EPA, 2010a). Average number of passengers/crew calculated based on the six ferries. Number of days operating in U.S. waters was estimated from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits"; assumes vessels generate sewage while underway and discharge to shore-side facilities while in port. Sewage generation rate was transferred from large cruise ships.

[d] Passenger vessels (including ferries) without overnight accommodations

The number of vessels was calculated based on a total of 6,548 inspected vessels, as reported in the U.S. Coast Guard's (2022) "USCG-PVA Quality Partnership Annual Report 2019 – 2021." Based on previous information provided by the Passenger Vessel Association (Comment (EPA-HQ-OW-2010-0126-0032) on U.S. EPA, 2010a), it was assumed that the majority of vessels operate Type III MSDs. Based on previous analyses of inspected passenger vessels, about 89% are less than 65 feet in length (U.S. EPA, 2010b). It was assumed that 15% of these passenger vessels greater than 65 feet in length (109 vessels) use Type II MSDs. It was also assumed that 15% of passenger vessels less than 65 feet in length (875 vessels) operate Type I MSDs. The estimate for average number of passengers/crew was based on information provided by internet searches for 17 passenger vessels ranging from dinner cruise vessels, tour boats, wedding party boats, and shuttles. Number of days operating in U.S. waters was estimated from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits." The sewage generation rate was determined based on telephone conversation between Eastern Research Group (ERG) and the Victoria Clipper (3,000-liter sewage holding tanks are 80% full after a 3-hour trip with 300 persons). Total time passengers are on board the vessel was estimated at 10.5 hours per day: (3000 L/trip x 0.8 x 1/3.8 L/gal)/300 persons x 1/3hrs/trip x 10.5 hrs/day = 7.3 gal/day/person

[e] Cargo/container/tanker ships

Vessel numbers were estimated using the VGP eNOI database. Vessels included were listed as "bulk carrier," "general cargo," "hopper barge," "oil gas tanker," "tank barge," or "other barge." The estimate for number of passengers/crew was obtained from Chamber of Shipping of America (Comments (EPA-HQ-OW-2010-0126-0024; EPA-HQ-OW-2010-0126-0042; EPA-HQ-OW-2010-0126-0043) on U.S. EPA, 2010a). Number of days operating in U.S. waters was estimated from a U.S. EPA Region 9 analysis of USCG port data that indicates 2.3 days per port call, and telephone contact with Horizon Lines indicating vessels make port calls every 2 weeks. Per capita sewage generation rate of 11 gallon/day/person was selected as the median of sewage generation rates provided by Chamber of Shipping of America (median selected rather than mean as the better indicator of the middle) (Comments (EPA-HQ-OW-2010-0126-0024; EPA-HQ-OW-2010-0126-0042; EPA-HQ-OW-2010-0126-0043) on U.S. EPA, 2010a).

[f] Great Lakes freighters

Number of vessels and number of passengers/crew were obtained from the Lake Carriers' Association comment (EPA-HQ-OW-2010-0126-0040) on the "Clean Water Act Section 312(b); Notice Seeking Stakeholder Input on Petition and Other Request to Revise the Performance Standards for Marine Sanitation Devices" (U.S. EPA, 2010a). This includes 54 total vessels with two having Type III MSDs and 52 having Type II MSDs. Number of days operating in U.S. waters was estimated from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits." Sewage generation rate was transferred from cargo/container/tankers ships.

[g] Off-shore utility vessels

Off-shore utility vessels include school ships, research vessels, offshore supply vessels, industrial vessels, and mobile offshore drilling units. Of the 11,034 vessels, 5,610 are tug and tow boats, and 50% are greater than 65 feet in length and 50% are less than 65 feet in length (U.S. EPA, 2010b). As a conservative estimate, it was assumed that all utility vessels greater than 65 feet in length have Type II MSDs and that all utility vessels less than 65 feet in length have Type I MSDs. It was also assumed that all utility vessels have a minimum of 4 crew members. Number of days operating in U.S. waters was obtained from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits." Sewage generation rate was transferred from cargo/container/tanker ships.

[h] Public vessels, unclassified

Public vessels include lighthouse tenders, hospital ships, law enforcement vessels, and ice breakers. Of the 622 total vessels, 7% are less than 65 feet in length (U.S. EPA, 2010b). As a conservative estimate, it was assumed that all public vessels greater than 65 feet in length have Type II MSDs and that all public vessels less than 65 feet in length have Type I MSDs. It was assumed that public vessels have a minimum of 4 crew members. Number of days operating in U.S. waters was obtained from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits" with an assumption that while vessels are in port, they do not discharge to shoreside facilities. Sewage generation rate was transferred from cargo/container/tanker ships.

[i] Tugboats/push boats

Total number of tugs is 5,424 (U.S. Army Corp of Engineers, December 2009). It was assumed that all tugboats have Type II MSDs based on telephone conversation between Eastern Research Group (ERG) and AEP River, a barge company. Average number of crew was estimated based on this conversation, as well. The value for number of days operating in U.S. waters was based on an assumption of daily operation, except for 15 days out of service per year for maintenance, based on telephone conversation with AEP River. Sewage generation rate was transferred from cargo/container/tanker ships.

[j] Commercial fishing vessels

Of the 69,944 commercial fishing vessels, 89% are less than 65 feet in length (U.S. EPA, 2010b). It was assumed that all commercial fishing vessels greater than 65 feet in length have Type II MSDs and that all commercial fishing vessels less than 65 feet in length have Type I MSDs. This is a conservative estimate since some vessels may have portable toilets that would be emptied at dump stations rather than requiring pumpout facilities. The number of crew – seven -- includes a captain, first mate, engineer, boatswain, and three deck hands according to the U.S. Bureau of Labor Statistics (2009). Number of days operating in U.S. waters was obtained from U.S. EPA's 2007 "Category 2 Vessel Census, Activity, and Spatial Allocation Assessment and Category 1 and Category 2 In-Port/At-Sea Splits." Sewage generation rate was transferred from cargo/container/tanker ships.

[k] Military vessels

Approximate total number of U.S. military vessels is 6,265 and includes Navy, Coast Guard, Marines, Army, Military Sealift Command, and Air Force vessels (U.S. EPA, 1999). Of the total vessels, only 587 report discharging graywater, which was used as a surrogate for the number of vessels with installed toilets. It is assumed that these vessels are currently operating holding tanks; however, the number of vessels and the types of devices being operated should be updated to reflect individual waterbody characteristics. Average number of crew and days operating in U.S. waters was obtained from U.S. EPA's (1999) "Phase I Final Rule and Technical Development Document of Uniform National Discharge Standards (UNDS); Graywater: Nature of Discharge" report. However, crew size varies significantly across military vessels such that the average provided should not be relied upon for calculations. The Tool should be modified for an individual waterbody to reflect the types and sizes of military vessels typically operating in that area.

[l] Recreational vessels

Recreational vessel numbers were taken from the US Coast Guard (2016) "2015 Recreational Boating Statistics Report". Only registered vessels that are mechanically propelled were included (11,034,479). Rowboats (97,067), canoes/kayaks (419,536), motor-less sailboats (110,261), and other watercraft

which were not mechanically propelled (205,706) were excluded. The number of vessels with MSDs was estimated based on the assumptions laid out in the U.S. Fish and Wildlife Service's (1994) "Clean Vessel Act: Pumpout Station and Dump Station Technical Guidelines," where 20% of vessels between 16 and 25 feet, 50% of vessels between 26 and 39 feet and 100% of vessels 40 feet and over have an MSD. Of these vessels, the National Marine Manufacturers Association (NMMA) assumes that 9% have type I MSDs, 0.1% have type II MSDs, and 90.9% have type III MSDs (NMMA comment (EPA-HQ-OW-2010-0126-0041) on U.S. EPA, 2010a). Eight persons were assumed for a typical recreational vessel having a Type II MSD based on best engineering judgement, since recreational vessels requiring a Type II MSD would either be larger or support more passengers. Sewage generation rate was transferred from large cruise ships and is a likely overestimate for recreational vessels.